© 2015 by Bryce W. Reeder. All rights reserved.

THE PUSH AND PULL OF WAR: THE POLITICAL GEOGRAPHY OF REBEL BEHAVIOR DURING WARTIME

BY

BRYCE W. REEDER

DISSERTATION

Submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in Political Science
in the Graduate College of the
University of Illinois at Urbana-Champaign, 2015

Urbana, Illinois

Doctoral Committee:

Professor Paul Diehl, Chair
Professor John Vasquez
Professor Robert Pahre
Professor Sara McLafferty

Abstract

The bulk of work on civil conflict seeks to explain variation *across* civil wars rather than *within* them. This has led to a better understanding as to why civil wars erupt in some countries, whereas others remain relatively peaceful over a prolonged period of time. What is lacking, however, is a complete understanding as to why civil conflicts evolve the ways in which they do. This project suggests that identifying the characteristics of the specific localities used by rebel organizations is vital to understanding this puzzle. A theory is developed that explains why rebels choose the geographic locations that they do, and under what circumstances relocation is likely to occur. The potential consequences of relocation are then explored, with an emphasis on civilian victimization during wartime. In addition, the influence of militarized interstate conflict and peacekeeping deployments are explored in relation to shifts in the behavioral profiles of rebel organizations.

The findings reveal that rebels do strategically select geographic locations that provide them with access to physical security and important resources. Relocation is observed when *negative shocks* occur locally, which are moments in time in which the locality in question becomes less conducive to rebellion. Relocation is significant in terms of rebel behavior because it is associated with the use of violence targeting civilian populations, especially when the rebel group is weaker relative to the national government. Finally, both militarized interstate conflict and peacekeeping deployments are shown to fundamentally alter local conditions, which in turn, leads to shifts in the tactics employed by rebels. This further highlights the importance of transnational factors in understanding the dynamics of internal wars.

For my McNair family and Chelsea, who made this all possible.

Acknowledgments

During my time in the McNair Scholars program at Boise State University we adapted a popular proverb for our own purposes – "it takes a village to raise a child" became "it takes a village to raise a scholar." In this spirit, we were pushed to make connections with those who would inspire and motivate us to fight for admission into a respected graduate program, move through the requirements, and ultimately graduate with our doctorates in hand. Lucky for me I was able to find these people at Boise State University, and found myself in an environment at the University of Illinois where each and every person I encountered were willing to assist me in my professional endeavors. Given the plethora of wonderful and helpful people I have encountered over the past decade, it is likely that I forget to mention someone who helped me along the way. This is not for a lack of gratitude, but rather because of the large number of individuals who have had a positive impact on my academic life.

My college career began because my father, Steven Reeder, agreed to co-sign on a student loan that covered my tuition for my first year at Boise State University. Needless to say, without this support, I would have never have had the ability to move to Boise and give college a try. My education would also not have been possible without the folks at Saia Motor Freight, who gifted a young guy a full-time job that paid the bills. The work environment was fantastic thanks to Sarah Daughdrill, who remains one of the better human beings I have ever encountered in my life. I would also like to sincerely thank Sonya Lawrence and Lisa Field, who worked with me as much as possible in order to allow me to thrive academically. The fact that they allowed me to work a five hour shift while my time with the McNair Scholars Program was heating up made all of the difference.

Academically, Ross Burkhart in the Department of Political Science took me under his wing and made me believe that I could find a place in the academy. The greatest gift he provided was an introduction to the McNair Scholars Program, which truly changed my life. It was there that I began to believe in myself and realized that I needed to succeed *because* I was a first-generation low-income student, not in spite of it. Helen Barnes, David Hall and Gregory Martinez fundamentally changed the way I viewed myself, which is something I can never thank them enough for (though, I plan to continue to try). I would also like to thank my McNair cohort at Boise State, who I continue to think about as I pursue a productive career in academia: Christian Belden, Arturo Gutierrez, Brian Lawatch, Anile Nina, Phillip Price, Matthew Reinhold, Carolina Valderrama, and Alberto Varela. Finally, I would like to thank my friends and family who provided a valuable escape from the pressures of school and work during this time (you know who you are).

I would also like the thank the faculty and staff in the Department of Political Science at the University of Illinois. In particular, I want to thank Paul Diehl for giving me a baptism by fire in his International Conflict seminar my first year in graduate school. That was an eye-opening experience that helped me understand what being a scholar was all about, and cemented the ambition to become one inside of me. I would also like to thank Paul for allowing me to serve as an editorial assistant for *International Interactions*, as it was also a period of significant professional growth. In addition to Paul, John Vasquez was a constant source of support and motivation, and Bill Bernhard reached out to me during the latter part of my graduate career and has been invaluable to my development. I also want to thank Bob Pahre for being a part of my dissertation committee, and also for inviting me to explore the caves of Mammoth with him and his students one fall – a truly fantastic experience. Finally, Sara McLafferty in the Department of Geography opened up her class to us political science folks which allowed me to acquire the skills that I needed to complete this project. She is also a irreplaceable member of my dissertation committee given her expertise in spatial econometrics.

My amazing cohort at the University of Illinois also deserves much of the credit: Amanda Cronkhite, Katie Francis, Gina Martinez, Matt Powers, Molly Ritchie, Ashly Townsen, and Tarah Williams. They were always willing to read my work, comment, and come listen to the same presentation over and over again. I would also like to thank David Bowden, Bryce Dietrich, Todd Robinson, Jason Renn, Gennady Rudkevich and Konstantinos Travlos for their support during this process.

Finally, I would like to thank Chelsea Chapman who has been by my side since my freshman year at Boise State University and moved to the middle of the corn fields to continue this journey with me. She is my rock, and continues to inspire me with the astounding level of kindness of compassion she shares with the world on a daily basis. Her family has also been unbelievably supportive – I am quite certain that Becky Chapman thought about founding my very own fan club, until she realized that Ashley Chapman would be the only member. VonDel Chapman, though he will never admit it, has also been an incredible source of support throughout this process. Finally, I would like to thank my mother, Cindy Crezee, and my five siblings for their love and support: Shawn Reeder, Josh Reeder, Dustin Reeder, Brandon Reeder, and Aubree Martin.

To conclude, a very special thanks goes out to the secretary at Firth High School who, when discussing college, told me "ya know Bryce, not everyone is meant for college" – her words continue to motivate me to this day.

Table of Contents

List of Tables . . . . . **ix**

List of Figures . . . . . **x**

List of Abbreviations . . . . . **xi**

Chapter 1 Introduction **1**
1.1 Prior Work on Internal Wars 4
1.1.1 The Local-Level "Causes" of Internal Wars 5
1.1.2 Civilian Victimization at the Hands of Rebels 12
1.1.3 The Move Towards Local-Level Analyses 15
1.2 The Contribution 19
1.3 Identifying a Causal Mechanism 21
1.4 Research Design, Data, and Results 25
1.5 Looking Forward 27

Chapter 2 A Local-Level Theory of Rebel Behavior During Wartime . . **30**
2.1 Rebel Incentives During Wartime 31
2.2 The Political Geography of Survival 38
2.2.1 Security-Based Factors 39
2.2.2 Resource-Based Factors 41
2.2.3 Considering Combinations of Local-Level Factors 43
2.2.4 The Importance of Group Strength 43
2.3 Local Shocks and Rebel Movement 45
2.4 Rebel Movement and Civilian Victimization 47
2.5 Transnational Sources of Local Shocks 51
2.5.1 Militarized Interstate Conflict 51
2.5.2 International Peacekeeping Deployments 54
2.6 Looking Forward 59

Chapter 3 Research Design **60**
3.1 Spatial and Temporal Domain 60
3.2 Measuring Concepts 65
3.2.1 Dependent Variables 66
3.2.2 Independent Variables 70

3.2.3 Control Variables . . . 80
3.3 Summary of Empirical Strategy . . . 82
3.3.1 The Models . . . 82
3.3.2 The Neighbor List (spatial weights) . . . 84
3.4 Limitations and Robustness Checks . . . 85

Chapter 4 The Location and Movement of Rebel Organizations . . . 87
4.1 The Location of Rebel Organizations . . . 88
4.1.1 Data and Methods . . . 89
4.1.2 Findings . . . 91
4.2 Local Shocks and Rebel Relocation . . . 94
4.2.1 Data and Methods . . . 96
4.2.2 Findings . . . 98
4.3 Conclusion . . . 103

Chapter 5 Local Shocks and Civilian Victimization During Wartime . . 106
5.1 Rebel Relocation and Civilian Victimization . . . 107
5.1.1 Data and Methods . . . 109
5.1.2 Findings . . . 111
5.2 Conclusion . . . 120

Chapter 6 Digging Deeper into the Relationship Between Peacekeeping Deployments and Rebel Behavior . . . 123
6.1 Rebel Responses to Peacekeeping . . . 124
6.1.1 Empirical Predictions . . . 124
6.1.2 Data and Methods . . . 124
6.1.3 Findings . . . 128
6.2 Conclusion . . . 133

Chapter 7 Concluding Remarks . . . 135
7.1 What Does it All Mean? . . . 138
7.2 Scope Conditions and Limitations . . . 141

Appendix . . . 145

References . . . 151

List of Tables

3.1 Summary of Local-Level Variables Included in Study 74

4.1 Ecological Niche Factor Analysis of African Rebel Organizations, 1990-2010 . 91
4.2 Influence of Local Shocks on the Movement of Rebel Organizations During Wartime, 1990 – 2010 99
4.3 Militarized Interstate Conflict, International Peacekeeping, and the Movement of African Rebel Organizations Across Geographic Space, 1990 – 2010 102

5.1 Rebel Movement, Local Shocks and Civilian Victimization in Africa, 1990-2010 112
5.2 Rebel Movement, Negative Shocks, and Civilian Victimization in Africa (weak versus strong groups), 1990-2010 115
5.3 Militarized Interstate Conflict, International Peacekeeping, and Civilian Victimization by African Rebel Organizations, 1990-2010 118

6.1 Local Conditions and the Use of Violence Against Peacekeepers by African Rebel Organizations, 1990 – 2005 127
6.2 Local Conditions, Peacekeeping Deployments, and the Diffusion of Civil War Violence in Africa, 1990 – 2005 129

List of Figures

3.1 Rebel Group Home-Range Profiles, January 2001 65
3.2 Intensity of Violence in Africa, 2001 68
3.3 Intensity of International Borders of Africa 72
3.4 Spatial Index of Geographic Space Conducive to Rebel Behavior, January 2001 77
3.5 Visualization of Neighbor List Used for Spatial Regression Models 84

4.1 Visualization of Ecological Niche Factor Analysis for African Rebel Organizations, 1990-2010 93
4.2 The Effect of Changing Local Conditions on Rebel Movement in Africa, 1990 – 2010 101

5.1 Rebel Movement and Civilian Victimization in Africa, 1990 – 2010 113
5.2 Rebel Movement During Negative Shocks and Civilian Victimization by Weak Organizations in Africa, 1990 – 2010 117

6.1 Intensity of Peacekeeping Deployments and the Probabilty of Civilian Victimization by Strong Rebel Organizations 128

List of Abbreviations

CIA	Central Intelligence Agency
COIN	Coalition Counterinsurgency Operations
COW	Correlates of War
DRC	Democratic Republic of the Congo
ENFA	Ecological Niche Factor Analysis
GPS	Global Positioning System
HRW	Human Rights Watch
IED	Improvised Explosive Device
ISIS	Islamic State of Iraq and the Levant
LURD	Liberians United for Reconciliation and Democracy
LTTE	Liberation Tigers of Tamil Eelam
LRA	Lord's Resistance Army
RENAMO	Mozambican National Resistance
PARECO	Resistants Congalais Mayi-Mayi
NPFL	National Patriotic Front of Liberia
RUF	Revolutionary United Front
SCAD	Social Conflict Analysis Database
SPEED	Social, Political, Economic Event Data
SPLA	Sudan People's Liberation Army
SLFP	Sri Lanka Freedom Party

TUF	Tamil United Front
TULF	Tamil United Liberation Front
FARC	The Revolutionary Armed Forces of Colombia
UCDP	Uppsala Conflict Data Program
ULIMO	United Liberation Movement of Liberia for Democracy
UN	United Nations
UNP	United National Party
US	United States

Chapter 1

Introduction

The Lord's Resistance Army (LRA) is one of the most brutal rebel organizations active today. Operating in Uganda and other neighboring countries, the group is known for targeting civilians and engaging in abductions, sexual violence, mutilations, and widespread murder. According to statistics published by the Central Intelligence Agency (CIA) the LRA has been directly responsible for 66,000 abductions between 1986 - 2005, and have forced an estimated 465,000 people to flee their homes from 1986 - 2011.[1] In addition to these significant consequences of LRA behavior, Human Rights Watch (HRW) estimates that hundreds of thousands of civilians have been murdered at the hands of LRA members.[2]

The sheer brutality with which the group operates has long had them on the radar of several countries. The LRA was labeled a terrorist organization in the aftermath of the September 11 attacks on the United States (US) and the United States Treasury Department placed Joseph Kony, the leader of the group, on a list of terrorists and imposed financial penalties (Capaccio, 2011). The US has also been directly involved in military operations against the organization. First, in November of 2008, the US provided equipment and intelligence to the Ugandan military in an effort to force the LRA from their jungle base during a mission code-named Operation Lightning Thunder (Gettleman and Schmitt, 2009). This was following by the decision by President Obama in 2011 to deploy military advisors to train and assist in eliminating the LRA once and for all.[3] The US has not been the only

[1] See the CIA Fact Sheet at: http://www.state.gov/r/pa/prs/ps/2012/03/186734.htm

[2] See the following: http://www.hrw.org/news/2012/03/21/qa-joseph-kony-and-lords-resistance-army

[3] See the following article: http://www.cnn.com/2011/10/14/world/africa/africa-obama-troops/index.html

external actor involved, as in 2012 the African Union launched an initiative to coordinate operations among several different countries in order to better control the LRA threat. Though, there continues to be significant disagreement on the specific roles of the various political actors involved.

These efforts at eliminating the group have been significant. However, the LRA remains active and thus continues to use violence against civilian populations and the troops of several legally-recognized states. This means that the LRA, which is a relatively weak actor, has been able to remain active in the region for nearly two decades. This is notable given the amount of resources that have been allocated with the intent to eliminate them – the advisors and equipment deployed by President Obama cost an estimated 4.5 million dollars per month (Arieff and Ploch, 2014), and the CIA claims to have dedicated nearly 560 million dollars in an effort to mitigate the influence of the group in the area.[4] The question that this brings into the forefront, then, is how was the LRA capable of surviving over such a prolonged period of time? Relatedly, why were international efforts to deal with the threat unable to put an end to the organization?

The answer to this question, which is the central theme of this research project, is that location matters. There are some geographic locations that are conducive to rebel behavior in that they provide access to resources and a notable level of physical security. In the context of the LRA, they are particularly known for exploiting densely forested locations, mountainous terrain, and the presence of international borders. This has allowed them to identify safe geographic locations, set up a safe-haven, and then engage in 'hit-and-run' tactics in which they go commit acts of violence and then flee to security. When pressure increases via the inflow of external resources and media attention, they simply relocate in order to survive the period of uncertainty. The repetition of this pattern helps explain why they have been able to survive for so long, as well as why efforts to eliminate the group have been unsuccessful.

[4]See footnote 1.

The goal of this project is to further delineate local-level factors in order to help explain why rebel organizations behave the ways in which they do – the assumption being, that the factors that are available locally will shape rebel behavior. This is a topic of inquiry that has largely been ignored in the mainstream civil war literature even though empirical evidence suggests that *where* armed non-state groups are operating from is important, as is evident in the LRA case. The stated purpose of this project, therefore, is to begin the process of addressing this shortcoming in the literature by developing a theory that uses the characteristics of localities to explain why rebels choose to base operations from certain geographic locations. Perhaps more importantly, the theory also explores the relationship between changes in local conditions and subsequent shifts in the tactics used by rebels. In this way, the contribution of this project is that it explains variation in the timing and geographic location of political violence that occurs during wartime.

Briefly summarized, the theory that is developed in Chapter 2 argues that much of the variation in the timing of political violence can be explained by identifying moments in which relocation occurs. The notion being that relocation, especially if it is forced, will be apt to limit the range of tactics a group may employ. In addition, the theory argues that the variation in the location of political violence can be explained by identifying specific local-level factors that are apt to attract rebels. Indeed, political violence will likely occur where rebels choose to base operations from as the national government and other political actors have an incentive to target them at those locations. Taken together, then, this project encompasses the following research questions: (i) why do rebels choose to occupy one geographic location over another?, (ii) under what circumstances does rebel relocation occur?, (iii) what are the humanitarian consequences of relocation in terms of civilian victimization?, and (iv) how might transnational factors, such as militarized interstate conflict and peacekeeping forces, influence rebel behavior at the local level?

This chapter begins by outlining the research on civil conflicts. During this process the shortcomings of this work with regard to its inability to account for the evolution of

internal wars is highlighted. Specifically, the argument is made that the focus of this work in on explaining variation *across* civil wars rather than *within* them.[5] This is followed by an explicit outline of the contribution made by this project, a summary of the theoretical framework, and a discussion of the empirical approach used to test the theoretical logic. It is during this section that the findings produced by this study are briefly discussed. Finally, an outline for the remainder of the research project is provided.

1.1 Prior Work on Internal Wars

The consequences stemming from civil war violence are profound. During 1945-1999 an estimated 16 million people have been killed in civil conflicts around the globe (Fearon and Laitin, 2003), while an estimated 90% of all fatalities resulting from warfare in the 1990s took place in internal conflicts (Lacina and Gleditsch, 2005). These immediate human costs are in addition to the socioeconomic costs and also the notable damage that often occurs to economic and social infrastructure. Civil war, for instance, has been shown to have devastating economic consequences for the host state (Koubi, 2005). There is also a growing body of literature that highlights the costs for human security and public health. Findings in this vein of work has produced evidence that internal armed conflict continues to maim and kill even after the cessation of violence (Ghobarah et al., 2003). This is because the legacy of armed conflict promotes the spread of disease (Murray et al., 2002), prevents states from providing public health services to their citizens (Iqbal, 2006), and incentives regimes and their neighbors to increase military spending despite the dire need to provide basic social services to a vulnerable population (Reeder and Reeder, 2014).

Given the severity these consequences, a large body of literature has emerged in recent decades that seeks to identify the correlates of political violence. For the most part, these studies that have sought to explain civil conflict are state-centric – they aggregate the de-

[5]With some notable exceptions, of course. These studies are discussed in the latter part of the literature review.

pendent variable to the state-level and record it on a year-to-year basis. There are some exceptions to this, of course, but much of the work discussed in this section emphasize variation among civil war characteristics. They do not, however, empirically account for the varying frequency, spatial clustering, or severity of violent events as they occur as a civil war evolves. This vein of research can identify the correlates of civilian victimization at the hands of the LRA in 2009, for example, but little can be said as to why a majority of those attacks occurred during only three months.[6]

This section briefly outlines some these important contributions, while also taking special care to highlight how the local-level perspective employed by this project has the potential to increase our understanding of internal wars. The literature covered includes studies of onset that can help explain the evolution of wars when conceptualized as local-level factors that are subject to change – such as levels of state capacity, government repression, and the presence of valuable natural resources. In addition, the correlates of civilian victimization at the hands of rebels is discussed. During the latter portion of this section, some disaggregated work on conflict is highlighted and discussed in order to place the approach here in the context of the burgeoning body of spatially disaggregated studies seeking to better understand political violence.

1.1.1 The Local-Level "Causes" of Internal Wars

State Capacity

Traditionally, theories of internal war have often emphasized the role of weak and/or failed states. Tilly (1975), for instance, notes that the establishment of states in western Europe required a heavy price in terms of "death, suffering, loss of rights, and unwilling surrender of land, goods, or labor." This was necessary, he argues, because there was a need to subordinate several social institutions and recognized authorities into a single centralized

[6]This pattern was observed via exploring the UCDP event data.

organization. This process of 'simplifying' society in order to effectively govern is a process that is very controversial and is thus resisted by much of the population (Scott, 1999). Internal resistance, in turn, is a long process leads to devastating periods of violence in what many scholars see as the inevitable process towards state formation (Ayoob, 2001). In this sense, instability and the use of state violence is a necessary condition in the quest for statehood.

Whether or not state formation is the end game in modern civil wars, the empirical observation that they do tend to occur in weak states is noteworthy. The reason is likely the fact that these states lack the resources, experience, and institutions to filter out popular discontent (Azam, 2001). Because of this, violence is often seen as the only option available to force the regime in question to meet the demands of society. This is difficult because weak states often lack the capacity to do so, which increases the likelihood of violence. This is contrary to developed states, as they usually have the wealth, resources, and institutions necessary to satisfy grievances and enough loyal manpower to keep the population in check via repression if needed. The former is more common in democratic regimes, whereas the latter is usually the preferred method of autocratic governments (Sambanis, 2001). Though, democratic regimes are more likely to increase repression vis-a-vis autocratic regimes when trying to cope with an external threat (Wright, 2014).

According to the literature, therefore, regimes have three potential options at their disposal when domestic instability begins to grow – they can honor the social contract and alleviate grievances, they can ignore the social contract and instead choose to impose order via repression, or they can do nothing. It is those states that choose to do nothing, or are unable to act because of a lack of state capacity, that will be apt to experience civil conflict (Mason and Krane, 1989; Arena and Hardt, 2014). This is why governments that are in the midst of a transition from one regime type to another are most prone to civil conflicts (Henderson and Singer, 2000; Hegre et al., 2001). They do not yet have consolidated democratic institutions at their disposal to alleviate grievances, nor do they have the ability to repress

at a high level. Thus, if a significant grievance arises they have no means to respond in a way that might provide stability and prevent violence from taking place. They are, for all intents of purposes, stuck between a rock and a hard place.

The issue with this focus on weak states and the lack of resources that they have at their disposal, is that the logic assumes that the level of state capacity is homogenous across a state's territory. In other words, there is not significant difference between the ability of a state to project its power near the capital and the ability of mobilize resources to respond to events on the periphery. In the context of a contemporary civil conflict, this assumption implies that the regime governing the Democratic Republic of the Congo (DRC) is equally capable of responding to unrest on its eastern border near Rwanda and Burundi as it is in Kinshasa, the capital city. This, despite the fact that the country is nearly the size of western Europe and Kinshasa is located on its western border. In this sense, conceptualizing state capacity as a state-level phenomenon largely misses the point – all state's are relatively strong in some locations when compared to others. In order to use this logic to explain civil conflicts, therefore, there is a need to account for the variation in the ability of a government to project its power across geographic space and the size of the state relative to that power. This is something that the current literature does not address.

In addition, this body of work also does not account for temporal variation in state capacity. Because troops that are affiliated with regimes have the ability to move across the country in response to events, this implies that the locations of high state capacity today may become areas of low state capacity tomorrow. These constantly evolving attempts to undermine rebels has implications for how the contentious interaction evolves between combatants, as well as the likelihood of another opposition group being born at a location with low state capacity as a consequence of these attempts. When taking this into account, conceptualizing state capacity as a local-level factor that is apt to change over time is not only capable of explaining war onset, but it also provides insight into *where* this violence is likely to erupt. It also has the potential to help scholars understand war dynamics, as levels

of state capacity ebb and flow across geographic space as a war progresses.

Greed and Grievance

In the literature, grievances are usually the result of a lack of economic opportunity for a large proportion of the population. This is why some have found that one of the most important factors in explaining the onset of civil conflict is poverty (Elbadawi and Sambanis, 2000; Collier et al., 2003; Fearon and Laitin, 2003). According to these relative deprivation theories, frustration from persistent poverty and a perception that it is inescapable produce violence via psychological mechanisms. This perception is the direct result of a gap that exists between actual outcomes and personal aspirations (Gurr, 1970), or the position of the individual relative to the most wealthy in society (Boswell and Dixon, 1993). Both mechanisms can arguably be seen in the relationship that has been observed between political violence and the distribution/use of land in the developing world (Moore, 1966; Scott, 1976). Booth (1991), for instance, makes the case that the exploitation of the peasant class by rich landowners in Central America was directly responsible for uprising in the 1970s and 1980s. In addition to these prolonged patterns of inequality, sudden shocks to an economy can give rise to grievances in society. The sudden drop in cocoa prices in the 1980s produced an unstable social environment in the Ivory Coast that many believe can be linked to the subsequent civil war (Woods, 2003). This is consistent with empirical evidence, as sudden drops in commodity prices has been linked to an outbreak in violence (Bruckner and Ciccone, 2010). There is some evidence, however, that this should only occur when wealthy elites are unable to relocate their assets (Boix, 2008).

Notably, grievances usually cluster on specific groups or tend to arise at a specific geographic area. The reason is that ethnicity and identity are often sources of cleavages in society, which has the potential to produce violence when certain conditions are present. These conditions seem to be widespread discrimination against a specific group, which produces the diffusion of anti-government sentiment among members of the group in question

(Horowitz, 1985; Petersen, 2002; Denny and Walter, 2014). Or, on the other hand, focused government repression and discrimination targeting specific geographic areas where support for the governing regime is low.[7] The goal of this state behavior is to mobilize the population in a way that will be beneficial to the current regime, or to marginalize a segment of the population who poses a threat to the status quo. In either case, the result is often the reemergence of societal tensions that are difficult to resolve (Alesina et al., 2003; Kanbur et al., 2011). This was observed in the buildup to the Sri Lankan civil war, in which widespread discrimination against the Tamil population led to the emergence of several different insurgent groups (Swamy, 2002; Roberts, 2009; Mampilly, 2011).

Not only do ethnically-based social cleavages produce grievances, they also provide greater opportunity to mobilize in preparation for war relative to non-ethnic groups. Ethnicity, for example, is highly visible and thus has played a role in many conflicts (Horowitz, 1985; Sambanis, 2001). According to Denny and Walter (2014), this visibility means that political elites are easily able to distinguish their own group from others, making nepotism more likely. In addition, the authors point out that because ethnic groups tend to live close to one another they are better able to mobilize – this is because they have institutionalized important mechanisms for managing intragroup relations.[8] Finally, the inelasticity of ethnicity relative to other forms of identity means that credible commitments are more difficult to come by. Taken together, the authors show that ethnic groups have ample grievances, opportunities, and incentives to fight relative to groups formed along different lines. This can partially explain why the Liberation Tigers of Tamil Eelam in Sri Lanka were able to survive for such a prolonged period time, as well as develop such a sophisticated fighting force (Swamy, 2002).

Given that grievances tend to arise along societal divisions, and that these groups tend to cluster together in geographic space, the role of geography is especially important. Few

[7] This is common and often occurs alongside the targeting of a specific group because ethnic groups tend to be clustered in geographic space (Toft, 2005).

[8] This logic is also found in Toft (2005).

studies account for geography theoretically or empirically, with Toft (2005) being one of the most notable examples. In her work, the author argues that whether or not an ethnic group mobilizes against a government is partially determined by the settlement pattern of the group in question. Those that settled in such a way that they are clustered in geographic space are more apt to mobilize because it eases communication and coordination. Those groups who are dispersed geographically, on the other hand, are less likely to mobilize because of the costs associated with doing so. It is important to note, however, that this work is concerned with the onset of ethnic wars. There has been little work looking at how these sorts of patterns might help explain why civil wars evolve the ways in which they do – something that is particular study is concerned with.

Contrary to the grievance literature (which tends to implicitly absorb ethnicity and identity), scholars have also theorized about civil conflicts being motivated by greed. This distinction became part of the mainstream academic discussion on civil via the work of Collier and Hoeffler (1998, 2001, 2002), and has dominated much of the quantitative civil war literature since. According to the greed hypothesis, civil wars stem from greedy non-state groups who are presented with an economic opportunity to enrich themselves. The source of the wealth can be from (or a combination of) the availability of valuable natural resources, donations from sympathetic groups, contributions from external states who are hostile to the current regime, or multinational corporations who have an interest in working with rebels rather than the regime. These potential sources of wealth are not mutually exclusive, of course. A third-party state or multinational corporation, for example, might be more apt to support rebels if they have access to valuable natural resources. Indeed, there is some evidence that international actors have a keen interest in wars involving natural resources (Humphreys, 2005). In any case, having access to a source of wealth helps sustain the group in question, assists in recruitment by promising personal enrichment, and acts as leverage when dealing with other domestic or international groups. This insight has led some

to argue that rebels should be conceptualized as criminal organizations (Collier, 2000),[9] as the end game is economic gain rather than some grand political ambition. This is arguably the case with the LRA, as the persistent civil unrest allows them to continue engaging in violent activity and profiting from local populations and their resources.

This logic also applies to national governments. The availability of valuable natural resources in a state's territory, for instance, has the potential to influence the likelihood for internal wars. Regimes that are dependent on oil, for example, have the no incentive to create a tax base because of the wealth supplied by the natural resource. This lack of an incentive means that important domestic institutions are not established that are able to communicate the preferences of the citizens to that of the government (Fearon, 2005). In addition, the wealth provides regimes with the ability to purchase equipment that assists in repression and also makes it possible to buy off elites who become upset with the current state of affairs. Though the ability to repress exists in these cases, widespread grievances have no other outlet than violence because of the lack of social/political institutions. This can produce a dangerous interaction between the regime and its citizens because repeated repressive acts tend to give rise to episodes of political violence (Lichbach, 1987; Gartner and Regan, 1996; Moore, 2000; Carey, 2006). With repression and state violence being the only tools in the toolbox, resource-dependent governments often do not have what they need to prevent, or respond to, a widespread uprising.

Despite the importance of the location of natural resources and those locations in which government repression is ongoing in explaining violence, the contemporary literature does not account for this. Rather, the emphasis tends to be on the level of repression or availability of resources at the state-level. Implicit in this logic is the notion that state repression and natural resources are distributed equally throughout a state's territory. There is no difference, for example, between the level of repression occurring at those locations where a popular uprising is taking place and those locations where support for the regime is relatively

[9]See Sanin (2004) for a different perspective.

high. By conceptualizing this relationship in this way, scholars are unable of explaining why violence tends to erupt at some locations but not others. In addition, measuring these concepts annually means that the timing of violence is also poorly understood, as the ebbs and flows of government repression is not accounted for. In this sense, civil war is treated as static, rather than a constantly-evolving process in which strategic interactions are shaping combatant behavior.

This is similar to the shortcomings pertaining to natural resources. By implicitly assuming that natural resources are equally distributed across a state's territory, scholars are also assuming that each rebel organization is influenced by the presence of these resources. The fact of the matter, however, is that a group may be thousands of miles away from diamond mines, which makes it unlikely that they are reaping any benefits from the resource. In much the same vein, the view of natural resources as being dichotomous is also problematic. This is because some locations include several diamond mines (to use one example), whereas another may only be proximate to a single mine. This is an important distinction, as rebels will likely be attracted to those locations that provide them with the most wealth. Because of this, it is necessary to account for *where* these armed non-state actors are in relation to natural resources.

1.1.2 Civilian Victimization at the Hands of Rebels

In the study of civilian victimization at the hands of rebels, scholars have identified a number of important factors that contribute to this strategic decision often made by insurgent groups. The first focuses on the role of group strength in conditioning the frequency and severity of attacks. In one study on the topic, Wood (2010) argues that weak rebel organizations that are coping with collective action problems are more apt to attack civilians via-a-vis their stronger counterparts. The underlying logic is the notion that weaker groups lack the capacity to provide incentives to members, and are also incapable of sanctioning members to compel support. Thus, they must rely on violence, which is a relatively low cost option (also see

Azam and Hoeffler, 2002; Kalyvas, 2006; Kalyvas and Kocher, 2009). One interesting caveat, however, is the additional finding that only weaker groups increase attacks against civilians as government pressure grows. This pattern does not hold for stronger rebel organizations.

This recent finding is supplemented by other work. Wood (2013), for instance, further delineates this incentive for civilian victimization by arguing that the source of support matters. Rebel organizations who rely on resources locally, usually from civilian populations, are less likely to attack civilians if they are stronger. In contrast, when the source of rebel support comes from a different source, the more powerful the insurgent group the more frequent and severe the attacks against civilians become. Thus, the role of group strength in explaining violence against civilians is conditional on the resource acquisition process on a group-by-group basis. This is consistent with the evidence provided by Hazen (2013), as well as recent work using event data that shows that weaker armed non-state groups who are competing with stronger groups are often relegated to killing civilians in an uncertain environment characterized by finite resources (Raleigh, 2012). It also fits nicely with the work of Weinstein (2007), who argues that rebels who are dependent on civilians are less likely to brutalize those that they depend upon.

The second motivation is the notion that by attacking civilians, the rebel organization in question will be able to extract concessions from the regime (e.g. a bargaining tool). This is most relevant to civil conflicts that erupt in democratic states, as rebels can create the perception that the government is unable to protect its citizens. This will lead to a citizenry that is mobilized to hold the regime accountable, either in elections or through other mechanisms. There is an incentive, therefore, for rebels to target civilians in democratic regimes (Eck and Hultman, 2007; Hultman, 2012). There is some evidence that this tactic is successful, as a recent study has found empirical evidence that there is a curvilinear relationship between civilian victimization and the likelihood of a negotiated settlement – a moderate level of violence is associated with what is likely deemed by the insurgent group in question to be a favorable outcome (Wood and Kathman, 2014). The use of violence against

civilians as a bargaining strategy was readily apparent during the civil war in Mozambique, as the Mozambican National Resistance (RENAMO) used this form of violence to undermine the government by producing war fatigue (Hultman, 2009). The overarching strategy was to force the government into negotiations, which is why RENAMO chose to target those living where support for the government was relatively high.

Finally, there is are some that argue that violence aimed at civilian populations is not always strategic, but can sometimes be driven by personal motives that were often present prior to war onset (but inform the evolution of the war and group behavior). This might include local political rivalries (Valentino, 2014), personal revenge (Kalyvas, 2006), resentment (Petersen, 2002), personal greed (Weinstein, 2007), a psychological response to a major loss during war (Midlarsky, 2005), or even sadism (Mueller, 2004). Because these motives undermine the ability of a group to achieve their end goals, those groups with a strong central command structure will likely seek to limit this type of behavior on the part of their members.

In addition to these group-level determinate of civilian victimization, there is also a growing body of work that looks at how international intervention might lead (or deter) civilian deaths. Of particular importance given the aims of this study is work that looks at the role of international peacekeepers. This is an important vein of research, as protecting civilians is now one of the core components of peacekeeping missions (Diehl and Druckman, 2010). This explains why, when looking at patterns of peacekeeping deployments at the local-level, these forces are especially keen on responding to this form of violence (see Townsen and Reeder, 2014; Powers et al., 2015). The most rigorous study to look at the effectiveness of peacekeepers in this regard is that done by Hultman et al. (2013). In the study, the authors find that peacekeepers are effective at protecting civilians, though there is a need for significant manpower in order to do so. This is because the more troops that are on the ground, the less likely that civilians are victimized.

Notably, the use of violence against civilians by rebels is widely seen as being suboptimal.

The importance of having the support of local populations has long been acknowledged by rebel leaders, as these populations often provide sanctuary from government forces, vital provisions that allow the rebellion to continue, and invaluable information about the location, intent and relative power of government troops (Migdal, 1974; Mason, 1996). This plays out empirically, as the level of civilian support is strongly correlated with a preferable outcome from the perspective of rebels (Scott et al., 1970; Kalyvas, 2004; Hultman, 2007). The onset of attacks against civilians at the hands of rebels, therefore, usually represents an attempt to counter a strategic setback (Hultman, 2007), promote group cohesion and encourage mobilization (Byman, 1998), acquire vital and/or strategic resources (Hoffman, 2004), or improve the bargaining position of the group (Lake, 2002).

Each of these motivations imply that there will be periods in time in which it is advantageous or necessary to engage in this behavior, though this incentive will not always be present. By disaggregating the study of civilian victimization spatially and temporally, one can get a sense as to *where* and *when* rebels are employing these tactics. This is contrary to most studies on the topic, as they either aggregate on the group (either a group kills civilians or they do not) or look at yearly patterns in terms of civilian victimization. By isolating specific temporal patterns, one can get a better sense of what factors are correlated with the use of this particular tactic. By accounting for where these attacks are occurring spatially, it becomes possible to correlate local-level factors with civilian victimization. These local-level factors include government repression, the availability of specific forms of resources, as well as other features that promote physical security.

1.1.3 The Move Towards Local-Level Analyses

Disaggregated analyses of political violence is a burgeoning field. There are many ways in which one may disaggregate, however. The two of interest for the purposes of this study is temporal and spatial. Temporal disaggregation is important because it allows scholars to study conflict-related mechanisms at a more appropriate time scale, which is capable

of better linking theoretical concepts and the data used to test expectations derived from theory (Kalyvas, 2008). Spatial disaggregation, especially when combined with temporal disaggregation, essentially affords the same advantage – by looking at where violence takes place, scholars can get a sense of the specific motivations driving the combatants and better understand how local-level features might be linked with the onset, evolution, and outcome of contentious interactions among political actors.

Arguably, the most prolific research program that looks at the local-level determinants of violence is that which explores violence in relation to climate – something that makes sense given the availability of local-level climate data locally. The evidence in this area seems to indicate that weather shocks that impact the growing season of the dominant crops tends to increase political violence at those locations (Harari and Ferrara, 2012), as do temperatures that are much warmer than normal (O'Loughlin et al., 2012). This is especially true when warmer temperatures are contributing to droughts over a significant period of time (Maystadt and Ecker, 2014). Using disaggregated data, rainfall has also shown to be a predictor of violence. Wetter than normal weather is associated with violence according to O'Loughlin et al. (2012), which has been confirmed by another study that found extreme rainfall variations to be associated with violent conflict (Raleigh and Kniveton, 2012). Finally, a meta-analysis confirmed these findings and found warmer temperatures and extreme rainfall to be associated with an increase in political violence (Hsiang et al., 2013). The substantive effect was estimated to be such that a 1 standard deviation change in climate would produce a median rise of 14% in the frequency of armed conflicts.

In addition to this work on climate variability, other work that is related to war dynamics has also appeared in recent years. This work was born out of the fact that civil war violence tends to diffuse across geographic space, with the onset of an event at one location increasing the likelihood that violence occurs at proximate locations (Schutte and Weidmann, 2011). In this sense, it is necessary to account for violence that is occurring nearby in order to understand the characteristics of violence at the location in question. One of the most

prominent examples of work in this area is that done by Balcells (2010, 2011). In a series of articles, the author looks at violence in all municipalities of Catalonia during the Spanish Civil War. The most important finding from the study is that the higher the prewar electoral competition, the more severe violence targeting civilians tended to be during wartime.

Other work has explored the relationship between economic factors and violence at the local-level. Perhaps the first disaggregated study to take on this question was done by Ostby et al. (2009). Using disaggregated data from Sub-Saharan Africa on welfare and socioeconomic inequalities, the authors find that conflict onset is more likely in regions low levels of education, high levels of relative deprivation, and strong intraregional inequalities. In addition, evidence is presented that the presence of valuable natural resources interacts with relative deprivation to make conflict onset more likely. This finding was later supplemented by a study performed by Buhaug et al. (2011), who looked at the relationship between absolute poverty at the local-level and conflict onset. Consistent with expectations and the findings by Ostby et al. (2009), absolute poverty was associated with conflict onset at those locations even if a country's GDP per capita was relatively high. It is noteworthy, however, that these findings differ from that presented by Hegre et al. (2009). In a disaggregated study using event data, the authors find that war events were more common in richer areas – which seems to indicate that opportunity might be more important than relative deprivation in the outbreak of violence at the local-level.

Other studies have focused on the evolution of violence in a number of specific cases. Braithwaite and Johnson (2012), for example, look at the relationship between Coalition counterinsurgency (COIN) action in Iraq and Improvised Explosive Device (IED) attacks. They find a recursive relationship, in that COIN operations respond to IED attacks but can also make IED attacks more likely in some cases. This is consistent with the spatial patterns uncovered by Linke et al. (2012), as they find evidence of a 'tit-for-tat' pattern of insurgent-coalition interactions. In much the same vein, a group of scholars recently published work that explores spatial patterns of contested urban spaces and its relationship to

patterns of violence in Jerusalem (Bhavnani et al., 2014). The authors find that proximity in geographic space and social distance via social networks can help explain violence. Thus, minimizing intergroup interactions might be successful in minimizing violence, though this strategy might be difficult and/or ineffective if entrenched social networks are present. Finally, McCauley (2013) uses micro-level data in Ghana to show that economic development strategies matter – namely, that those that create contestation across group lines will make violence more likely.

In addition to the focus on conflict onset and dynamics at the local-level, other work has appeared recently that looks at the role of peacekeeping forces in influencing violence locally. First, Townsen and Reeder (2014) sought to explain why peacekeepers are deployed to some locations but not others. Notably, they find that the spatial distribution of peacekeeping forces is predicated on a number of local-level factors, such as the presence of transportation networks, population centers and international borders. They also find that peacekeepers tend to be most concerned with government-rebel battles and areas where civilian victimization is ongoing, a finding later confirmed by Powers et al. (2015). In this article the authors also find that a peacekeeping mission becomes better at responding to conflict events the longer they have been in the country. The effectiveness of peacekeepers at the local-level is considered by Costalli (2013), who finds that they tend to be successful in mitigating violence.

Taken together, this growing body of disaggregated work has contributed greatly to our understanding of civil conflicts. The problem with much of this research, however, is that the role of geography in influencing conflict behavior remains understudied and in many ways, taken for granted. The reason is that much of this work still looks at patterns of violence annually instead of disaggregating the work in a manner that is more conducive to understanding war dynamics. In other words, the research is unable to correlate a specific factor with a particular outcome. Using data measured yearly, for example, makes it impossible to determine whether international intervention is truly associated with a decrease in violence

because one is unable to account for the timing of events. Intervention that occurs *after* the onset of violent events are coded the same as interventions that occur *before* an outbreak in violence. Any findings that pertain to this relationship, then, might be spurious as the direction of this causal relationship can not be captured by the statistical models.

The second shortcoming of most disaggregated work is that it is simply disaggregated spatially, but does not actually treat 'space' as an important factor. Most studies, for example, simply use a more disaggregated unit of analysis but continue to rely upon methodologies that fail to account for spatial dependence (most common being various forms of regression analysis). What this essentially means is that scholars are still taking the role of location for granted in their studies of political violence. As such, questions pertaining to the diffusion of violence across geographic space remains poorly understood. In addition, the failure of many studies to account for spatial dependence puts many findings into question as much of the violence occurs could be the result of spillover, or might directly be related in some other way to violence occurring at proximate locations.

1.2 The Contribution

Aside from building on the disaggregated work cited above, the contribution of this project is twofold. First, it seeks to develop a local-level theory of rebel behavior that is predicated on the actual locations utilized by armed non-state groups. In doing so, the argument is made that location matters and can be used to explain why rebels behave the ways in which they do. It can help scholars understand, for example, the timing and intensity of LRA attacks targeting civilians – a tactic that tends to be employed for only a few weeks during each year. This has obvious implications for policymakers, as understanding what specific factors are associated with the onset of violent events can help external actors mitigate the consequences of these events. In addition to identifying the timing of these events, having an estimate as to where armed non-state groups are located can help policymakers identify

those population centers that are most at risk of attack. As such, peacekeepers and other forces can be deployed to deter rebels from engaging in these human rights abuses.

The second contribution of this project is to assist in building a bridge between macro and micro-level studies of political violence. As highlighted during the literature review, some of the important factors that are associated with onset can also play a role in the evolution of wars when conceptualized in a different manner. State capacity, government repression and the location of valuable natural resources, to use the examples cited in the literature review, are actually local-level phenomenon. They are subject to ebbs and flows in terms of intensity and/or value, and also where they fall in geographic space. By accounting for this temporal and spatial variation, these factors can be linked to rebel behavior during wartime. In the context of this particular project, this has the potential to provide insight into why rebels behave the ways in which they do. Through potential extensions to this project, this topic of inquiry also has the potential to help scholars understand the birth of rebel organizations and how local-conditions might influence the structure and institutions that are established by armed non-state actors.

In addition to these two theoretical contributions, this project also develops a unique geo-referenced dataset constructed from existing event data. This data provides month-to-month estimates of rebel locations in Africa. These estimates are used to create two new variables that have yet to be considered by scholars – the extent of movement across geographic space and the spatial extent of rebel organizations. As will be argued in greater detail throughout this project, these two factors are vital in understanding shifts in rebel behavior during wartime. In addition, several local-level measures are attached to these estimates of rebel location. Examples include forest cover, elevation/slope, levels of state capacity, intensity of government repression, intensity of interstate conflict, among others.

The next section outlines the causal mechanism that is used to explain shifts in rebel behavior during periods of civil conflict. As is to be expected, this mechanism has a strong spatial component as it is predicated on the movement of rebels across geographic space.

This section will lead into a more detailed discussion of the research design and findings.

1.3 Identifying a Causal Mechanism

This project is concerned with exploring the spatial dimensions of political violence at the group level, and argues that much of the variation observed in rebel behavior is the result of where these actors are located in geographic space – what resources are available locally, and whether or not relocation is taking place. In doing so, I argue that it is important to consider four interdependent forms of variation: temporal, spatial, severity, and group-level. In other words, *when* do rebels engage in violent activity, *where* do the violent events take place, *how many people* are killed during each violent episode, and *who* was responsible for the attacks. By focusing on these four elements, I am able to explain why an insurgent group chooses to launch attacks at one moment in time, but not another. Similarly, the theoretical approach is able to distinguish those groups that rarely engage in some actions, such as civilian victimization, and those who often rely on the use of such tactics.

Contrary to contemporary work that emphasizes state-level factors, the theory presented in this project focuses on the role of local-level factors. The assumption driving this decision is non-controversial – political violence, especially attacks against civilian populations, is a local-level phenomenon. As such, understanding why these tragic events occur when and where they do requires an account of local characteristics and the motivations driving the specific actors occupying the area. In discussing the impact of these local-level conditions, I argue that armed non-state groups are rational, complex organizations that continually update their tactics in order to meet the realities of a changing strategic environment. By doing so, they are able to maximize the probability of achieving long-term success in an environment characterized by significant uncertainty and danger. They are not, as is implicit in much of the state-level research, a mere collection of individuals that are solely reactive to a more powerful political actor. Rather, insurgent movements have a plethora of strategic

decisions to make over the course of a civil conflict and are willing to adapt in the name of survival.

The most basic (and arguably vital) strategic decision is where to base operations from. The central theme of this dissertation is that this decision matters. The reason for this is that not all locations are created equal – some are more conducive to rebel activity (and thus, survival), whereas others place significant limitations on the group. What this means, essentially, is that the locations occupied by armed non-state actors become a significant causal mechanism in understanding why rebels behave the ways in which they do. In addition, because this is a strategic choice, the locations chosen by insurgent movements can provide important insight into the wartime strategies a group will likely employ at any given moment in time. This aspect of rebellion is one that has been taken for granted in the literature. The theory presented herein fills this gap, by showing why the location of civil conflict activity is vital in understanding the evolution of rebel behavior.

In delineating the importance of local-level characteristics on rebel behavior, the theory relies on the concept of push and pull factors – concepts common in tourism and animal studies. The notion being that rebel organizations will seek out an ecological niche (a concept also borrowed from animal studies) that provides them with the greatest probability of survival. Survival in the context of rebellion is the product of security and resources. Security is found in local-level features such as international borders, forests, mountains terrain, and a general lack of state capacity. Resources can be acquired locally, such as working with civilian populations, via valuable natural resources, operating near productive croplands, and other important terrain characteristics. Those security-enhancing features and resources that assist rebels are conceptualized as pull factors, whereas those that might deter rebels (e.g. government repression) are defined and push factors. Rebels are predicted to seek out locations that have a favorable balance of push/pull factors because doing so increases the menu of tactics available to the group. Notably, however, I argue that the

preferred features will differ depending on several group-level factors.[10]

Though the above logic can explain why one location is chosen over another, it does not answer the central question that inspired this study – what explains the evolution of rebel behavior during civil war? Specifically, the spatial and temporal clustering of rebel attacks targeting civilian populations. In answering this question, I argue that many local-level factors are subject to ebbs and flows during civil conflict. As changes in local conditions produce a fundamental shift in the balance of push/pull factors, a given area is apt to become less or more preferable to rebels at specific moments. I term these events as *local shocks*, which are defined as sudden alterations in the characteristics of the geographic space occupied by rebels. These shocks come in different forms, each of which is predicted to alter rebel behavior in a different manner. The first, which I term *positive shocks*, are instances in which the difference between the pull and push factors increases. During these periods the geographic space becomes more conducive to rebel behavior, increasing the probability of group survival while also expanding the range of options available to the group. This increase in security and/or resources is predicted to decrease attacks against civilians by creating an incentive to remain stationary. Though, which will be discussed at length in the next chapter, this is conditional on the strength of the rebels relative to the regime and other armed non-state groups.

Contrary to *positive shocks*, *negative shocks* are moments in which the geographic area occupied by the group becomes less conducive to rebel behavior. This is usually a consequence of increasing government presence in the area, but might also arise because of the deployment of peacekeeping forces, severe drought, or a natural disaster that leads to an influx of government resources.[11] When a *negative shock* takes place, I argue that there is a strong incentive to relocate in search of an area with a more favorable balance of push/pull factors. This is because the range of options available to the group has decreased, which

[10]The logic driving this argument is found in the next chapter – especially as it pertains to group strength relative to the national government

[11]This is not an exhausitve list of the factors considered in this study.

means that they might not be able to behave in a way that is consistent with group goals. This puts the survival of the rebels at risk. By moving across geographic space in search of a more suitable location that provides an acceptable balance of push and pull factors, they are able to reestablish (or improve upon) the status quo. Reestablishment in this context refers to finding a location where the balance of push/pull factors is roughly equal to what is what before the *negative shock*, whereas improvement refers to finding a location where local conditions are actually more favorable to rebels.

It is the onset of these unexpected *local shocks*, therefore, that are the causal agent of behavioral change that takes place over the course of an internal conflict. Because rebel organizations are strategic actors that seek to maximize the probability of group success, they are unlikely to ignore the onset of a *local shock*. Rather, group leaders will either take advantage of the increased range of options available in the case of a *positive shock*, or attempt to adapt to the changing security environment that is inherent in a *negative shock*. In this sense, the decision to adjust behavior according to these shocks is rational behavior on part of the organization. Failure to account for these local changes can either put the survival of the group at risk, or lead to suboptimal behavior in which the organization fails to exploit a potentially valuable opportunity to improve their prospect for success.

Empirically, however, there are cases in which suboptimal behavior is observed in a geographic sense. In other words, some organizations choose to remain in locations that are not particularly conducive to rebel behavior. This begs the question – why would insurgent forces choose to occupy a less than ideal geographic location? The answer to this question, as argued in the next chapter, has to do with the amount of available space available locally. When territory that is conducive to rebel behavior is in short supply, there is an opportunity on part of the government to be present at these specific locations in a relatively short period of time (or, to maintain a presence). This creates an incentive on part of the rebels to find a location with security-enhancing features and become entrenched at that location. This incentive to stay put is also true when the rebel organization was founded along ethnic lines,

as the sacrifice made in terms of security might be deemed worthwhile if significant gains are made in terms of funding and recruitment. The influence of *local shocks* on rebel behavior, therefore, is predicted to be conditional on a) the range of the difference between push and pull factors locally, b) the spatial extent of geographic space that is conducive to rebels, and c) whether or not the rebel group in question was formed along ethnic lines.[12]

The central causal mechanism employed in this dissertation, which can be described as the characteristics of the local environment and sudden changes in those characteristics, is applied to both internal and international processes in this project. In the case of the former, a theory is developed that describes how the onset of government repression and the presence of other important local-level factors have the potential to produce *local shocks*, fundamentally altering the behavioral profiles of rebel organizations. Regarding the latter, the onset of interstate conflict and the deployment of international peacekeepers are investigated as they pertain to shifts in the local environment occupied by insurgent groups.

1.4 Research Design, Data, and Results

In order to test the empirical expectations derived from the theory, event data is used to construct a spatially-referenced dataset that includes every formally organized rebel group in Africa. The dataset is spatially-referenced, in that each rebel group month is a spatial polygon that represents the likely location occupied by the organization during the month in question. This is accomplished via home-range analysis, which makes it possible to estimate the home-range of a species. It is useful in the study of rebel organizations, as the core assumption is that the chosen location is that which maximizes the ability of the group to survive in the short-term (Krebs and Davies, 1997). Like animal populations, the geographical areas chosen by rebel organizations are not random, but are strategic decisions made by group leaders and thus have an underlying spatial structure. By using this method to

[12]Note that these condtional effects are not the focus of the subsequent empirical chapters, but are accounted for via research design strategies and control variables in the empirical models.

determine the locations occupied by rebels, I am able to empirically explore why one location is chosen over another. In addition, the construction of home-range profiles provides information pertaining to the size of the geographic area occupied by each rebel organization, and also the range of movement observed month-to-month during periods of civil conflict.[13]

In addition to the construction of a geo-referenced dataset that uses individual rebel organizations as the unit of analysis, it was also necessary to operationalize the characteristics of the locations occupied by the groups. The influence of each local-level factor on rebel behavior is examined in isolation, as well is together by creating a spatial index of geographic space conducive to rebel behavior. The notion being that it is the combination of factors at a given location that makes it more desirable to rebels.

Using this data, the various hypotheses (which are developed in Chapter 2) are tested using a series of spatial regression models and some estimation strategies borrowed from ecology. Specifically, ecological niche factor analysis (ENFA) is employed in order to better understand why rebels choose one location over the potential alternatives. In addition to this approach, spatial regression models are used to estimate the influence of *local shocks* on rebel relocation and subsequent behavioral changes. This includes the domestic sources of *local shocks* and transnational sources, such as interstate conflict and peacekeeping deployments.

Notable findings produced by this project, very briefly summarized, are as follows:

- Empirical evidence suggests that rebels do strategically select geographic locations based on the amount of physical security they provide, as well as the extent to which they ease resource acquisition.

- The relationship between rebel movement across geographic space is curvilinear – attacks occur at moderate levels of movement.

- Rebel relocation is associated with deteriorating local conditions. During these periods,

[13]These home-range profiles, along with information about each rebel organization for each month they were active, will be made available via an R package entitled rGIS shortly after the dissertation defense.

organizations who are weaker relative to the national government are more likely to target civilians.

- Interstate conflict is associated with relocation when the group is stronger relative to the national government, weaker organizations decrease their movement across geographic space.

- Interstate conflict that occurs in the context of deteriorating local conditions is associated with increased civilian victimization at the hands of weak groups.

- Rebels that are weaker relative to the national government tend to remain stationary when peacekeepers are deployed to their location in order to exploit the security-enhancing benefits.

- Rebels that are stronger relative to the national government increase levels of civilian victimization and are also more likely to kill peacekeepers when deployments occur nearby.

1.5 Looking Forward

In Chapter 2, I elaborate on the theoretical framework briefly described above. It addresses the factors that make a specific location conducive to rebel behavior, as well as those local-level factors that organizations would prefer to avoid. The availability of space conducive to rebel behavior is then discussed as an explanation of why some rebel groups behave in one way, while simliar groups employ very different tactics during an ongoing civil conflict. Next, the concepts of *positive* and *negative shocks* are further delineated with an emphasis on how these factors might influence the decision of a rebel organization to abandon one location in favor of another. It is during this discussion that an explanation as to why sudden shifts in the behavioral profiles of armed non-state actors occur over time during civil conflicts. Specifically, certain forms of *negative shocks* are predicted to produce an increase in violence

against civilian populations. This chapter is then concluded by considering the role of two transnational factors in this process: militarized interstate conflict and peacekeeping deployments.

Chapter 3 provides a detailed overview of the research design. The chosen method for accounting for local-level factors is discussed in great detail, as is the spatial technique used to estimate where rebels are located during any given moment in time. The former, which I refer to as the Conflict-Space Raster data (CS-Raster), provides month-to-month estimates as to which locations are conducive to rebel behavior. The latter, which I refer to as the Rebel Groups in Space data project (R-GIS), provides month-to-month estimates of where African rebel groups are operating from during the 1990-2010 period.[14] In this chapter, each of the covariates that will be used in testing the hypotheses outlined in Chapter 2 are described, as are the statistical estimation strategies that will be employed. Special care is taken to note any limitations of the research design, and any robustness tests that will be utilized are briefly discussed.

Chapter 4, 5, and 6 are the empirical chapters of this research project, and will thus present the findings from the statistical models and discuss the implications. The focus of Chapter 4 is the locations chosen by rebel organizations, and how each of the factors identified can help explain why one location is chosen over another. In this chapter, the role of *local shocks* in producing rebel relocation is also empirically tested. Chapter 5 tests the hypotheses concerned with the influence of rebel relocation on the behavior of rebel organizations. In particular, this chapter presents evidence of a significant difference between *negative* and *positive shocks* in terms of subsequent behavioral changes on the part of rebel organizations, as well as evidence that group strength matters in this process. Finally, Chapter 6 further explores the relationship between peacekeeping deployments and shifts in rebel behavior. In particular, the factors associated with rebel violence targeting peacekeepers, as well as the

[14]R packages are nearing completion that will make each data source downloadable for use in the study of political violence at the local-level.

correlates of the diffusion of violence across geographic space are considered.

Some concluding remarks are presented in Chapter 7. A summary of the findings is provided, and some implications of this project are discussed. Several extensions to this project are also proposed, most of which focusing on the importance of linking local-level findings to state-level processes.

Chapter 2

A Local-Level Theory of Rebel Behavior During Wartime

Why do rebel organizations shift tactics over the course of a civil conflict? This chapter argues that political violence, especially attacks targeting vulnerable civilian populations, is a local-level phenomenon. As such, understanding why these tragic events occur when and where they do requires an account of local-level characteristics. In particular, the strategic decision of where to base operations from provides important insight into the tactics that will likely be employed by armed non-state actors. Below, the argument is put forth that rebels seek to maximize their probability of survival by occupying geographic locations that are conducive to providing physical security and access to important resources. When the level of protection and/or amount of resources available for acquisition is reduced, the theory that is presented below predicts a strong incentive to relocate will result. This incentive, especially when the group is weak relative to the government, is predicted to produce a fundamental shift in the behavioral profiles of rebel organizations.

The role of the geographic locations occupied by armed non-state groups during wartime has been taken for granted in the civil war literature thus far. The theory outlined herein fills this gap by explicitly outlining why the location of rebels is vital in understanding why they behave the ways in which they do. As is discussed in greater detail below, the reason for this is that the level of security and resources a group has at its disposal directly influences the range of potential strategies that an organization might employ. Thus, rebel organizations who have access to local-level features that provide physical security and resources are more apt to behave in accordance to achieving their end goals. Those organizations who do not have access to security and/or resources, on the other hand, are relegated to do what is

necessary to survive in the short-term. This often involves behavior that is not in the best interest of the group, such as launching raids on villages in order to acquire resources.

This chapter first provides a brief overview of the dangerous environment that rebels are forced to cope with during wartime. It is the fact that rebels are forced to operate in this environment that produces the incentive to occupy geographic areas that have certain features. This is followed by a description of the causal mechanism that is predicted to alter rebel behavior – a fundamental shift in the amount of security and/or resources available at a given locality. During this discussion the concept of *local shocks* is introduced, and a distinction is made between *negative* and *positive shocks*. The next section develops a theory of civilian victimization that is predicated on the movement of rebel organizations across geographic space. The chapter is then concluded by applying this theoretical logic to two transnational sources of local shocks: militarized interstate conflict and international peacekeeping deployments.

2.1 Rebel Incentives During Wartime

Survival in the context of an ongoing civil conflict is difficult for rebel organizations. In particular, the severity of the threat posed to these groups and the great uncertainty surrounding the acquisition of resources are challenges that must be overcome. The most common source of threat is the national government, which nearly always has a much larger amount of military power relative to the rebels (Cunningham et al., 2009). If necessary, the government also has the ability to mobilize significant levels of manpower and resources in the name of putting an end to the rebellion. This is an advantage that states have, as inherent in the process of establishing a governing body is the ability to extract rents in the name of producing military armaments, increasing manpower, and investing in research and development in order to promote technological innovation (Taliaferro, 2006). It is rare that rebels have access to such benefits, which ensures that even if the government does not

possess a preponderance of power during onset, the regime is capable of growing steadily in power as the conflict evolves (i.e. enjoy relative gains).

In addition to the state-based threat, rebel organizations often have to cope with the presence of other armed non-state groups. Examples of rebel-based violence are plentiful, with one being the armed confrontations that occurred between the United Liberation Movement of Liberia for Democracy (ULIMO) and the National Patriotic Front of Liberia (NPFL) during the Liberian Civil War. ULIMO was formed by fighters who took refuge in Sierra Leone, and re-entered Liberia in 1991 and was able to capture NPFL territory near the diamond mines concentrated near Lofa and Bomi counties.[1] These cases are not unique, however, as in many cases rebels spend as much time and resources fighting other armed non-state groups as they do the government (see Cunningham et al., 2009, page 572). The reason that rebels are willing to dedicate such high levels of resources to this end, is that the groups are often competing for resources and other materials that will aid them in their battle against the government (Fjelde and Nilsson, 2012). This behavior is so prevalent among rebel organizations that some communities have established their own armed groups to combat the influence of other rebel organizations. One example is the Patriotes Resistants Congalais Mayi-Mayi group (PARECO) in the Democratic Republic of the Congo, which was formed to defend its constituency from other armed actors.[2]

There are also some extreme cases, especially when the rebel group in question has committed some act that the international community deems unacceptable, when coalitions of states seek to undermine the organization. More prominent examples of this include the campaigns targeting the Lord's Resistance Army (LRA) and the ongoing effort targeting the Islamic State of Iraq and the Levant (ISIS). Intervention in an attempt to undermine rebels is not restricted to coalitions of states, however, as in many cases third-party states have been known to act alone in an attempt to undermine rebels. This tends to occur when

[1] Other examples can be found in Afghanistan, Democratic Republic of the Congo, Burma, and Sudan.

[2] New York Times - Notes from a Young American in Congo: A Rebel Speaks: http://kristof.blogs.nytimes.com/2011/11/04/notes-from-a-young-american-in- congo-a-rebel-speaks/

rebels are using territory as a safe-haven with the consent of the state, or when the rebel organization in question is known to cross the border and inflict harm on the state or its citizens (Gleditsch et al., 2008). In the former scenario, there is a strong incentive to target the rebels because failure to do so might lead to an interstate dispute with the government (Schultz, 2010). This is a costly prospect, as disputes that take this form are apt to be severe, even relative to disputes that arise over territory (Reeder, 2014).

Security is not the only concern, of course, as resource acquisition is often difficult while armed conflict is ongoing. Resources are especially important because they directly shape the capacity of a rebel organization to continue fighting (Hazen, 2013). The difficultly in acquiring resources is predicated on three realities: (i) the government and other actors have an incentive to prevent easy access to resources that benefit the rebels, (ii) there is great uncertainty surrounding the benefit that might be enjoyed by gaining access to a given resource, and (iii) the ability of the government to prevent access, as well as the benefits enjoyed via acquisition, are subject to ebbs and flows over the course of a civil conflict.

The incentive to prevent access is born out of a strong desire on part of the government to undermine the opposition movement. As previously discussed, this can be accomplished militarily, but can also be done by making acquisition more difficult. In most cases, the method for doing so involves shaping policy around the source of resources currently sought by rebels. By some accounts, for example, a large proportion of rebels organizations have extracted and sold natural resources in order to fund their campaigns (see Le Billon, 2001; Ross, 2004; Lujala, 2010). Examples include diamonds in Sierra Leone, timber in Burma, gold in the Democratic Republic of the Congo, cocoa in the Ivory Coast, and ivory in much of sub-saharan Africa. In order to profit from these goods, however, they must be able to bring them to market. Without market access, natural resources are essentially worthless to rebels operating in the context of civil conflict. Thus, in order to undermine a opposition movements, governments can establish roadblocks, border controls, or sanctions against potential buyers. This method also works in preventing small arms from reaching

rebel forces (Killicoat, 2007).

Not all resources are material, which requires different tactics on part of the government if they hope to limit access. Political resources, in which there are political patrons who are willing and able to provide support to rebels, is one such example. This might involve providing material resources through channels that evolve in order to avoid interception by the government. The material support provided to Liberians United for Reconciliation and Democracy (LURD) during the Liberian civil war is one such example. Though, most political support that occurs during civil conflicts involve allowing rebels to establish a safe-haven across international borders. This has been observed in numerous cases, such as Congolese rebels in Rwanda and Uganda, Uganda rebels in Sudan and the Congo, Burundi and Rwandan rebels in the Democratic Republic of the Congo, among others.[3] Finally, diaspora communities often provide substantial financial support, as well as apply political pressure on governing elites in their adoptive states. Tamil diaspora communities played a large role in sustaining the opposition during the Sri Lankan civil war, for example (see Chalk, 2000; Subramaniam, 2000).

The issue with politically-based resources is that there are significant costs, both in terms of the supply and demand side of the equation. From the demand side, most third-party support has strings attached that require that specific actions be taken if support is to continue (Salehyan et al., 2011). This makes this option attractive for weaker organizations who are desperate to maintain some ability to wage war. This incentivizes organizations who grow more powerful over time, however, to abandon political support in favor of an option that allows for more autonomy. Because rebel strength relative to the government is apt to change, both in terms of objective measures of power and perception of power, there is the potential that rebels might burn bridges over time as they sway between sponsorship and non-sponsorship.[4] The relationship also has the potential to turn on the rebels, such

[3]See Salehyan (2009) for more cases and a detailed discussion.

[4]Reputational costs are also likely a consequence of this incentive – in other words, other sponsors will be less apt to provide resources to the group in question.

as what took place in Sri Lanka when Indian support for Tamil rebels evolved into a rather precarious partnership that eventually ended entirely (Smith, 1999).

With regard to the supply side, the third-party partner risks becoming involved in repeated incidents of militarized conflict with the government (Gleditsch et al., 2008). The reason is that ongoing third-party support decreases the probability of settlement by increasing the ability of rebels to wage war. As such, the national government has a strong incentive to put an end to third-party support in order to make the opposition vulnerable and less able to recruit and thrive in the unstable domestic environment. This explains why the two forms of third-party involvement in civil wars that are most associated with benefiting rebels, direct intervention and interstate coercion, are apt to produce severe interstate conflict that is comparable in magnitude to territorial disputes (Reeder, 2014). Becoming involved in severe episodes of militarized conflict also has the potential to produce audience costs, as there might be a backlash domestically as the military is given precedence over public services (see Iqbal, 2006, 2010; Reeder and Reeder, 2014, for a discussion of the consequences for public health).

The incentive of a government to limit access to important resources is not the only obstacle. There is also a need to determine which resources to seek without perfect information. Is it worth it for rebels, for instance, to suffer the costs associated with fighting for a geographic location where lootable diamonds are available if there is uncertainty whether or not they will be able to get the goods to market? Similarly, the price of a natural resource now will not be the price of that resource in the future. Thus, the perceived benefit at the time might not be realized following acquisition. This is especially true because the government would prefer to limit access to those resources that will benefit rebels the most. The fight over access to diamonds in Sierra Leone, for instance, were often severe and led the Revolutionary United Front (RUF) to retreat into the forests. The reason that these resources were given precedence over others, is that they were the primary source of rebel revenue for much of the civil conflict. Though the RUF were able to profit, there were

points in time in which they suffered costs with little financial return because of government pressure (Metelits, 2009).

Finally, the amount of resources that rebels are able to extract over the course of a civil conflict are subject to ebbs and flows. The first reason for this is the back-and-forth that takes place between rebels and the national government, in which the government seeks to prevent armed non-state actors from being able to secure a variety of different resources over time. As the benefit enjoyed by rebels increases, the likelihood that the government attempts to cut off the supply increases, as well. This includes material resources such as access to diamonds, croplands and timber, as well as political support such as a neighbor allowing rebels to operate from their territory. The second reason for ebbs and flows are price shifts in markets that are rooted in the global economy, or occur because outside actors are acting in an effort to undermine rebel funding. This might take place by deterring the sale of "blood diamonds," for instance. Or, by putting political pressure on those who would import the goods in question.

By some accounts, coping with these ebbs and flows is the most important goal task of armed non-state groups because without resources rebellion cannot continue (Metelits, 2009). This is why a significant decrease in resources is often accompanied by behavior that most would argue is not in the best interest of the group. The Revolutionary Armed Forces of Colombia (FARC), for example, began to commit acts of violence against civilians in the face of government repression in order to acquire resources even though it led to a dramatic reduction in popular support for the group (Metelits, 2009). The difficulty associated with resource acquisition is likely also part of the reason that a large proportion of rebel organizations are willing to accept third-party sponsorship, even though it places important limitations on group behavior (see Salehyan et al., 2011, for a discussion).

The importance of both physical security and resources during wartime incentivizes groups to do whatever is necessary to meet the needs of the group. Likewise, from the perspective of the national government (and perhaps other actors), there is a strong incen-

tive to prevent armed non-state groups from overcoming these obstacles. The evolution of a civil conflict, therefore, may be conceptualized as this interaction that occurs among the parties to the conflict. The easier it is for a rebel organization to gain access to physical security and resources, the more likely that the campaign against the government will continue. Much in the same vein, a government that is able to prevent rebels from meeting these basic requirements for rebellion inherently raise the costs on those involved, which has the potential to gut the movement by undermining recruitment and efforts to establish relationships with civilian populations at specific localities.

The source of these costs imposed on rebels are the violence and insecurity faced by rebel group members. If physical security is not guaranteed, for instance, members of the rebellion will be more likely to be killed by government forces. Similarly, civilians who cooperate with rebels will be more apt to suffer at the hands of government forces. This implies that cooperation between the regime and civilians will increase, which will also make it more likely that those involved in the opposition movement will be identified. Identification risks having those close to individual members, such as family and friends, imprisoned or killed by those operating under orders issued by the current regime. This is a real risk, as in the context of an ongoing civil conflict civilians are often caught in the middle of the contentious interaction and are often killed due to a perception that they are favoring one side over the other (Kalyvas, 2006; Balcells, 2010).

Preventing rebels from acquiring resources has a simliar influence on the rebellion, as the benefits associated with participation are limited. This means that recruitment efforts will not be predicated on the promise and wealth and prosperity, but will instead need to focus on the overall goal of the movement or guarantees that certain human rights abuses will be tolerated (see Gates, 2002; Weinstein, 2005, for a discussion of rebel recruitment efforts). Recruitment is further complicated by the costs that it might impose on individuals. Without access to wealth that is necessary to survive at a personal level (and in many cases, support a family), potential members must be willing to sacrifice their livelihood in the name of

participation. Scenarios such as these mean that it will be difficult to attract members, which puts the short-term survival of the group at risk.

At the group-level, failure to acquire resources undermines the ability of rebels to wage war. This is not only because access to resources includes military armaments, manpower and other necessary tools, but also because the inability to feed rebel troops makes it more difficult to maintain discipline. This increases the probability that the group, on a whole, begins to behave in a manner that might undermine the end goals of the movement. This includes raiding villages in order to acquire resources, the use of indiscriminate killing during these raids, kidnapping for ransom, and the use of sexual violence (see Bakke et al., 2012, for a brief discussion of discipline in rebel organizations). In addition, the likelihood that the group splinters into other sub-groups is apt to increase during these periods as some members become apprehensive about the behavior of their peers.

Overcoming the challenge of physical security and resource acquisition, therefore, is a central goal among all rebel organizations engaged in civil conflict. Doing so is not only a necessary condition for survival, but it will also allow the group in question to act in accordance with group goals. Because political violence is a local-level phenomenon, it is necessary to understand what specific local-level factors can assist rebels in overcoming these obstacles and why it is often so difficult to do so. In the following section this is explicitly addressed, with an emphasis on developing a theory as to why rebels choose to occupy the geographic locations that they do.

2.2 The Political Geography of Survival

Explicit in the above logic is that rebel organizations will seek to occupy locations where physical security and resource acquisition is possible and relocate when there are sudden changes to the amount of security and/or resources available. In order to explain which geographic spaces are likely to be preferred by rebels, I employ the concept of pull and

push factors. Pull factors are those that tend to attract rebel organizations because of the availability of vital and/or strategic resources, or due to an ability to enhance group security. Push factors, on the other hand, are those factors that push rebels away from a given location because the current conditions put the group at risk and prevents them behaving a way that is conducive to securing group survival. In other words, pull factors are those associated with security and/or resources, whereas push factors are those associated with the lack thereof. In this section, a series of push and pull factors are discussed and placed into one of two groups: security-based factors and resource-based factors.

2.2.1 Security-Based Factors

As highlighted by previous work on civil war violence, security during wartime is usually extracted from the local environment. In particular, mountainous terrain and forest cover have been linked to the onset and escalation of domestic political violence in some state-level analyses (Buhaug and Gates, 2002; Fearon and Laitin, 2003). These locations tend to attract combatants because they provide a sense of physical security. Rebels are able to employ what amount to 'hit-and-run' tactics, in which they attack government forces or civilian populations and then retreat to terrain that is difficult to navigate. Any effort to pursue or root out the groups that occupy these locations is likely costly, as the positions are defensible. The RUF, for example, often speaks of the forest as their 'savior' due to the security it has provided.[5] As such, mountainous terrain and forested areas are considered pull factors, in that they are likely to attract armed non-state groups who are seeking to avoid being sanctioned by the regime in question.

The role of the third security-based factor, international borders, is well-documented (Salehyan, 2008, 2009; Salehyan et al., 2011). According to this literature, international borders provide physical security by allowing the group in question to establish safe-haven

[5]A detailed discussion of the importance of forests can be found in the RUF manifesto: www.sierra-leone.org/AFRC-RUF/footpaths.html

in another state's territory. Operations are thus conducted in close proximity to the border so that rebel troops can quickly retreat across the border in order to avoid being sanctioned by the government they are fighting. This arrangement between rebels and a third-party can be voluntary, or may exist simply because the third-party state lacks the capacity to prevent the rebels from maintaining a base in their territory (Salehyan, 2009). In any case, pursuing rebels across international borders increases the likelihood of interstate conflict, whereas continued third-party support often leads the government to aggressively target the third-party state in an effort to raise the costs associated with allowing rebels to operate within their territory (Schultz, 2010; Reeder, 2014). Thus, international borders are not only a pull for rebels because they provide safe-haven, they are also a pull because it might also force the government to dedicate resources to fighting an external state. This will reduce the amount of resources the regime can dedicate to combating the rebels, increasing group autonomy is those spaces that once were subjected to state violence and government repression.

Implicit in this discussion is that rebels would prefer to avoid any area where the government is able to exert its power. Even if rebels choose to base operations from a location where government forces are absent, for example, the risk of the government quickly deploying troops would likely prove to be far too risky for a group concerned primarily with survival. This provides a strong incentive on part of non-state actors embroiled in civil conflict to seek out those geographic spaces that have been described by some scholars as being 'black spots' or 'ungoverned spaces' (see Rabasa et al., 2007; Stanislawski, 2008). At these locations rebels enjoy more autonomy and are sometimes able to begin functioning as shadow states (Reno, 1998), hybrid political orders (Fischer and Schmelzle, 2009), or engage in warlordism (Marten, 2006). By doing so, rebels are able to establish more reliable mechanisms to acquire resources, and are also more apt to connect to the international system much in the same way that states do (Vinci, 2008). All of which increases the probability of survival.

From this discussion, the following hypothesis is proposed:

Hypothesis 1 *Rebel organizations will prefer to occupy locations that provide them with a sense of physical security. This includes:* **(1a)** *forested areas,* **(1b)** *mountainous areas,* **(1c)** *localities near international borders,* **(1d)** *away from areas with high levels of state capacity., and* **(1e)** *away from locations in close proximity to government repression.*

2.2.2 Resource-Based Factors

The pull of natural resources on rebel organizations, the next economic factor, is well-documented empirically. In addition to the large-N analyses that have confirmed a positive relationship between natural resources and the dynamics of political violence (see Lujala, 2010, for an overview), there is a large body of qualitative work that has documented the importance of natural resources to combatants on a case-by-case basis (see Le Billon, 2001; Samset, 2002, for a few examples). Consistent with this work, this theory argues that natural resources are a strong pull for rebel organizations. Phrased using the terminology of contemporary civil war studies, both groups motivated by greed and grievance have strong incentives to occupy these areas (see Collier and Hoeffler, 2001, for the logic). For rebels driven by greed, natural resources provide a source of significant wealth and can also assist in recruiting other members with the promise of financial rewards (Weinstein, 2005). For those groups motivated by grievance, the wealth can be used to provide social services to the population that the regime has chosen to exclude, or simply be a source of revenue that is able to sustain operations for a prolonged period of time. Though the location of these resources are relatively static,[6] the market value of natural resources is apt to change over time. This is especially true in the context of civil war, as violence has the potential to fundamentally alter the production of some resources (Mitchell and Thies, 2012).

[6]This depends on the resource being considered, of course. If the drug trade is thrown into 'natural resources' this is not the case. Also, there are often new discoveries of petroleum or minerals that increase the amount available to rebels.

The second economic factor, which is considered to be a pull factor, is the amount of crops being produced at a given location. There are several accounts of rebel organizations who have essentially adopted a 'hunting and gathering' method to acquiring vital resources. The benefit to operating near areas where crops are being produced are twofold. First, it alleviates some of the difficulty with maintaining supply lines that are necessary to sustain troops as combat operations are ongoing. This is especially salient in the case of weaker groups who lack the institutional structure or leadership necessary to make sure that supplies are being supplied to where they are most needed. Relying on local food sources allows rebel troops to stray from the group's home base without much fear of going hungry. Second, high crop yields imply the presence of civilian populations engaged in agricultural activities. Civilians such as these are highly attractive to rebels because they are apt to live in rural environments that are relatively far away from centers of state power and control, and also because the benefits associated with establishing rebel-civilian relations are higher relative to civilians that do not participate in the production of resources. In addition, if the rebels became desperate there is ample opportunity to simply pillage the food sources in order to survive.

The final pull factor that is predicted to supply resources to rebels are locations where acts of political expression are ongoing. Political expression are anti-state acts perpetrated by civilians with the aim of expressing their discontent with the national government. These can include protests, riots, sit-ins, boycotts of government goods, and other related activities. The presence of these actions signal to rebels that the likelihood of establishing relationships with civilian populations is relatively high. As is the opportunity to attract new recruits and funds from the civilian population at these locations. There is an incentive, therefore, to seek to move to these locations if the group in question can benefit from civilian support.

From this discussion, the following empirical expectation is derived:

Hypothesis 2 *Rebel organizations will prefer to occupy locations that provide them with access to resources. This includes:* **(2a)** *diamond mines,* **(2b)** *croplands, and* **(2c)** *near acts of political expression.*

2.2.3 Considering Combinations of Local-Level Factors

Determining which geographic locations are conducive to rebel behavior will not likely be predicated on a single factor – rather, various combinations of pull factors might attract rebel forces. The reason for this is that one factor might be able to substitute for another. If rebels were to lose third-party sponsorship, for example, diamond mines might become more attractive as a consequence. In much the same vein, losing access to a densely forested area might prompt a rebel organizations to seek out an international border in order to achieve some sense of physical security.

In addition to substitution effects, there is also the possibility that the benefits provided by the presence of one pull factor is worth the costs that might be imposed by some specific push factors. If having access to another state's territory by operating near a border region is deemed to be essential for survival, for instance, rebels might be willing to remain at that location even in the face of increasing government repression (via the government or external state). This is especially likely to be true when a strong incentive exists for rebels, such as those formed along ethnic lines. These groups have a strong incentive to remain in close proximity to their ethnic kin in order to provide protection. Doing so also allows the group to recruit, coordinate, and engage in other activities that enhance their ability to survive. Even though the location of their kin may not be near some local-level features that would prove to be beneficial, these groups are still likely to choose these locations as a base of operations. This was observed in the case of the SPLA in South Sudan, as they often suffered significant costs to retake cities that the government captured (Rone, 1994).

2.2.4 The Importance of Group Strength

The behavior predicted above is conditioned by the strength of the rebels relative to the national government. Rebel organizations who are stronger relative to the national government are less apt to be concerned with physical security, as the level of threat imposed is not

severe enough to threaten survival. Weaker groups, on the other hand, are likely to seek out those locations that provide physical security and resources because they likely lack other means to cope with these problems that are inherent in waging rebellion.

This is consistent with recent work that differentiates between stronger and weaker groups, and finds strong empirical support that the latter behave fundamentally different vis-a-vis the former. This difference is usually predicated on resource availability and security concerns. There is evidence, for instance, that weaker rebel organizations target civilian populations because they suffer from collective action problems (Wood, 2010). This is because they lack the resources necessary to provide incentives to members and are thus forced to rely upon violent tactics (also see Azam and Hoeffler, 2002; Kalyvas, 2006; Kalyvas and Kocher, 2009). Notably, evidence is also presented that only weaker groups increase violence against civilians when government repression takes place. Stronger groups are able to cope with this and behave in a manner that is more conducive to realizing the group's end goals.

These recent findings have been supplemented by other work. Wood (2013), for instance, further delineates this incentive for civilian victimization by arguing that the source of support matters. Rebel organizations who rely on resources locally, usually from civilian populations, are less likely to attack civilians if they are stronger relative to the national government. In contrast, when the source of rebel support comes from a different source, the more powerful the insurgent group the more frequent and severe the attacks against civilian populations become. Thus, the role of group strength in explaining violence against civilians is conditional on the resource acquisition process on a group-by-group basis. This is consistent with the evidence provided by Hazen (2013), as well as research using event data that shows that weaker armed non-state groups who are competing with stronger groups are often relegated to killing civilians in an uncertain environment characterized by finite resources (Raleigh, 2012). It also fits nicely with the work of Weinstein (2007), who argues that rebels who are dependent on civilians are less likely to brutalize those that they depend

upon.

In the literature, therefore, there is growing evidence that group strength matters. These findings are especially salient when outlining the incentives concerning *where* rebels are likely to operate during wartime. Because of this, I propose the following hypothesis:

Hypothesis 3 *The stronger the rebel organization relative to the national government, the more likely that they will operate away from areas that are conducive to rebel behavior.*

2.3 Local Shocks and Rebel Movement

Though the above explains why rebels choose to operate from the geographical locations that they do, it does not explain why a group would choose to relocate. Briefly stated, rebel organizations will prefer to operate from locations where the total influence of pull factors are greater relative to the sum influence of push factors. This, as described above, is because it is these locations offer a higher probability of survival – in other words, rebels will have the autonomy to behave in a manner that is conducive to achieving their end goals. The process of finding and occupying these spaces, however, is not as simple as it seems. Many of the push and pull factors identified in the above discussion are not static over space and time; rather, several are subject to sudden change that can dramatically alter the amount of security and/or resources available at a locality. I refer to these sudden changes as *local shocks*, which are defined as any factor that produces a sudden change in the local environment occupied by a rebel organization. These *local shocks* can be sudden, such as the onset of government repression or state violence. Or, take place over a longer period of time, such as the consequences for crops and water supplies that often result from an intense heat wave.

According to this logic, *local shocks* have the potential to take two forms. The first, *negative shocks*, are those in which the locality occupied by a rebel organization becomes less conducive to rebels. This means that the amount of physical security and/or resources

at the location in question decreases, which reduces the probability that the group can survive. This produces a strong incentive to relocate in order to find a new locations where the group might be better off than it would be if they remained stationary. Though a group need not heed the incentive to relocate, not doing so has the potential to be disastrous. This essentially socializes groups to relocate under these conditions, or risk extinction.[7] For all intents and purposes, therefore, this movement may be conceptualized as being forced relocation. From this, I derive the following:

Hypothesis 4 *Rebel organizations will be more likely to relocate during periods of negative shocks.*

Contrary to *negative shocks*, *positive shocks* are instances in which conditions for rebels improve at a given locality. In other words, the amount of security and/or physical security has increased at the location that they occupy. This increases the probability of survival and produces an incentive that is opposite of that present during periods of *negative shocks* – namely, that the organization should remain at the current location and enjoy the improved conditions. From this, I derive the following:

Hypothesis 5 *Rebel organizations will be less likely to relocate during periods of positive shocks.*

It is notable, however, that there are other factors that might influence the decision to relocate during the onset of a *local shock*. Or, stated differently, it is possible that the decision to relocate is conditioned by the experience of the group in the locality. If, for instance, a rebel organization has become entrenched at a given location and has begun establishing social services, relocating might be unlikely even in the context of a *negative shock*. Group goals and structure also play a role here, as secessionist groups might be unwilling to abandon

[7]This is not unlike the socialization argument put forth by Waltz (1979). In *Theory of International Politics* he argues that states are free to ignore the constraints imposed by anarchy, but will likely not do so because that would risk disaster.

the territory that they hope to govern. In the same vein, ethnically-based groups may be unlikely to leave their ethnic kin as they are often a vital source of funding, and there is often an expectation to protect one's kin. To take one example, the SPLA in Sudan lost one of their strongholds of Bor to the Sudanese government in 1992. In response, they launched a counterattack in order to regain the city and prevent the government from killing those civilians loyal to the SPLA (Rone, 1994) – a risky move that would likely not have been made if they had not become so entrenched in the area.

2.4 Rebel Movement and Civilian Victimization

Relocation is not a simple process, but represents a significant strategic decision that fundamentally alters the menu of options available to a group. There are three core reasons why this is the case. First, movement across geographic space can potentially devastate an opposition movement. By relocating, rebels are abandoning any local-level feature that provided physical security, access to resources and are forced to sacrifice any other investments that they have made in the local community (i.e. deal with losing sunk costs). During periods of movement, therefore, rebels are especially vulnerable because the level of uncertainty surrounding both resource acquisition and security has increased dramatically. If a rebel organization fails to reach an area that is more conducive to survival, or perceived a location to be more suitable than it actually was, there is an opening for the national government (or some other actor) to target the organization. Doing so will make survival more difficult, as recruitment will decline as the costs associated with membership increases. There is also an increased likelihood that members will defect in order to avoid the costs being imposed by the more powerful actor.

The second reason why relocation is a costly action has to do with the strategic limitations it places on the group. Not only are groups that relocate more vulnerable because they are losing access to the local-level features that they once enjoyed, but they are also

placing notable limitations on how they might respond to an event that takes place during the relocation period. Stationary groups, for instance, have many more options at their disposal vis-a-vis organizations that are on the move because they have access to security-enhancing features and likely have an established source of resources. Depending on how long they have been occupying the location in question, there is also the possibility that they have established relationships with local civilian populations. The presence of these factors affords the group in question the autonomy to continue their campaign against the national government and any other actor that is impeding the group from attaining their end goals. Because basic needs are met, stationary groups might also choose to engage in institution-building or other non-violent actions that further improve the prospects of group survival.

Groups on the move, on the other hand, are usually entering territory where there is uncertainty surrounding the most reliable sources of security and vital resources. They have also not had an opportunity to work with civilian populations, which means that they will not be able to rely on civilian-rebel relationships to survive the current period. There is also little incentive to begin to establish institutions, as there is a real possibility that the group will not be choosing the current area as the location to occupy. When push comes to shove, therefore, rebels that are engaged in relocation will be more likely to emphasize short-term survival over other ends. This might lead to the use of suboptimal tactics, as they are not in the best interest of the group. This includes coercing civilians into providing aid, and perhaps even killing in the process. This occurred when government pressure increased on FARC (Metelits, 2009), was observed early in the Sri Lankan civil war when survival was difficult for the LTTE (Swamy, 2002), and is likely the reason for surges in violence against civilians by the Sudan People's Liberation Army (SPLA) in Sudan (Arnold and LeRiche, 2013).

The final reason that relocation is costly for rebels is the notable uncertainty surrounding the process. The decision to relocate in the context of war requires some sort of decision-

making regarding the likely target location. The assumption being, that this new location will provide the group in question with a renewed sense of physical security and access to the resources that are needed for survival. The issue with this assumption is that rebels are not currently near the new area, and thus have no sense as to what the group will encounter upon arrival. In addition to this reality, there is the possibility that a *local shock* will occur during the movement period. This means that the chosen location will be fundamentally different than what was anticipated. This risk, therefore, is that the organization in question will make themselves worse off rather than better – something that further decreases the likelihood of survival.

Because relocation is potentially costly for rebels, it is unlikely to occur in cases in which there is not increasing pressure on rebels and the rebels possess relatively good information about the target area. All else equal, armed non-state actors would prefer to occupy a given locality for an extended period of time, as entrenchment can only increase the probability of group survival.[8] The exception to this are moments in which positive shocks occur in close proximity to a rebel organization. During these periods there is an opportunity to improve the prospects of survival by relocating to the location where the difference between the pull and push factors is greater relative to the current location. If the area in question is directly contiguous to the locality occupied by rebels, there is also an incentive to expand in order absorb the new territory.[9] This should only take place, however, if the group is certain that the potential costs of doing so are lower when compared to the perceived benefit. Thus, rebels will only engage in relocation in the absence of a *local shock* if the group can continue to behave in a manner that is in the best interest of the organization.

It is during periods in which *negative shocks* occur, therefore, that there is likely to be a fundamental shift in the behavioral profile of a rebel organization. During these moments, rebels are essentially forced to abandon the location in question. This creates an environment

[8]This is evident in the frequency of institution-building observed among rebel organizations.

[9]Note that spatial expansion is not explored in this dissertation, but instead is an extension that may be explored in a later project.

plagued by uncertainty regarding physical security and the acquisition of resources. The probability that the group in question is relegated to coercing civilian populations into providing support is likely to increase. This is especially true for weaker organizations, as the extent to which their options decrease as a consequence of movement is greater relative to stronger groups.[10] In particular, not only do stronger organizations have a larger portfolio of resources, but they are also more capable of confronting government forces military and are also apt to occupy a larger geographic area. Basing operations from a larger area implies an ability to move away from one location while still enjoying the benefits of having access to important local-level features. Thus, they are able to pull out of the location under threat while still being able to secure themselves and access important resources. This leads to the following empirical prediction:

Hypothesis 6 *Movement that occurs in the context of negative shocks will be associated with an increase in the use of violence against civilian populations by weak rebel organizations.*

Like the decision to move across geographic space, the use of violence is a costly action that requires time, effort, and resources. There is, therefore, a limit on how frequent and severe violent action can be during periods in which relocation is taking place. This implies that the relationship between relocation and the use of violence against civilians during periods of negative shocks is nonlinear – it should increase as movement increases, but decrease as movement becomes extreme. In other words, rebels will be apt to attack civilians during periods of movement, but not if they are dedicating all of their time and energy to finding a new location that is conducive to rebel behavior. From this, the following empirical prediction is proposed:

Hypothesis 7 *There will be an inverse-U relationship between movement across geographic space and the use of violence against civilian populations by rebel organizations.*

[10]This is evident by several studies which have highlighted the importance of group strength in conditioning civilian victimization in the context of civil conflict (as already cited).

2.5 Transnational Sources of Local Shocks

The logic above discusses the role of domestic factors in conditioning where rebels operate from and under what circumstances relocation makes sense. As is evident by the civil war literature, however, very few internal conflicts are isolated from the influence of global politics and outside intervention. In this section, I discuss two potential transnational sources of local shocks and theorize about how they might influence the local environment occupied by rebels. Doing so can provide insight into how interactions between states, and international efforts to end civil war violence, might influence armed non-state actors.

In particular, I apply the main causal mechanism outlined above – the onset of *local shocks* that incentivize rebel organizations to relocate in order to find a locality more conducive to rebellion. Doing so will increase the likelihood of survival during an ongoing civil conflict, but will require behavior that is not in the best interest of the group. This is predicted to be especially true of weaker organizations, who have a much smaller portfolio of tactics/strategies available when relocation is ongoing (and, in general). In the discussion that follows, therefore, specific components of interstate conflict and peacekeeping deployments are identified that are apt to give rise to *local shocks*.

2.5.1 Militarized Interstate Conflict

The logic outlined above has been applied to factors that are, for the most part, endogenous to the civil war. Political factors that push and pull rebels to specific locations, for instance, tend to evolve alongside the war itself. State violence, government repression, and political expression are all intimately related to the civil war, which explains why they are predicted to be the factors associated with the location and movement of rebels across geographic space. Civil conflicts, however, are rarely isolated to the host country. Rather, there are several transnational dynamics that have the potential to alter every phase of the conflict under consideration. Some of these transnational features are also endogenous to the civil

war, such as the role of refugees (Salehyan and Gleditsch, 2006), cross-border safe havens (Salehyan, 2009), third-party sponsorship (Salehyan et al., 2011), and the diffusion of violence across international borders (Buhaug and Gleditsch, 2008). There are others, however, that are exogenous to the civil war and are often out of the control of the combatants embroiled in conflict.

Exogenous shocks, be they *negative* or *positive*, are significant to the dynamics of war because they are, in many cases, out of the control of all involved parties to the conflict. Such events influence the evolution of rebel-government interactions, often without the consent of either party. One such example, interstate conflict, warrants consideration in this study because it is commonplace during internal wars (Gleditsch et al., 2008). Not only are contentious interactions between states more likely when civil conflict is ongoing, but they are also apt to recur and become serious threats to regional security (see Schultz, 2010; Reeder, 2014). This is especially true when the host state is involved in an active rivalry, as the internal conflict provides a useful vehicle for the third-party rival to undermine the regime (Salehyan, 2010).

As an external state becomes involved in militarized conflict with the host country, resources are diverted away from the civil war in an attempt to cope with an external threat. This reduces the amount of 'push' a government can impose on the geographic space, increasing the amount of autonomy enjoyed by rebel organizations.[11] On the other hand, if a regime decides to ignore the external threat and continue using a large proportion of available resources to engage rebels, they risk setting a dangerous precedent – any external challenge that occurs during a civil war will not be met with a response. Thus, the government has a difficult decision to make – they can either continue to suppress the rebellion in order to increase their probability of victory in the civil war, or divert resources in order to respond to the external challenge (while also potentially deterring future challenges by setting a

[11]This is especially the case in autocratic regimes because they have a higher baseline of repression (Henderson and Tucker, 2001; Regan and Henderson, 2002)

precedent for responding to aggressive challenges).

The choice that the national government makes is likely predicated on the level of external threat and/or the salience of the issue at stake. A salient issue in which the third-party adversary has mobilized forces is likely to prompt a militarized response from the government because such an act has the potential to undermine national security. Evidence suggests that in scenarios such as this, states have a tendency to respond in a resource-intensive manner. Territorial disputes, for example, are more prone to escalate and thus tend to produce more fatalities when compared with disputes that arise over other issues (Hensel, 1996; Senese and Vasquez, 2003). It is also notable that interstate rivalry is often born out of interstate competition related to territory (Diehl and Goertz, 2000), which implies that states are willing to dedicate a significant amount of resources over a prolonged period of time in order to pursue a desired outcome. This implies that disputes that arise over certain issues might be more apt to lead to a response on part of the government. The empirical evidence suggests that along with territory, some forms of disputes that are born directly out of the war itself can produce an extremely aggressive reaction (Reeder, 2014).

The onset of interstate conflict that leads to a diversion of resources away from fighting the civil war in favor of responding to an external threat might influence the behavior of rebels in a number of different ways, depending on *where* the conflict is occurs. Interstate conflict that occurs inside (or, in close proximity) of the geographic space occupied by a group will likely lead to an influx of government resources and manpower. Like government repression, this will impose hierarchy at that location, limiting the menu of tactics/strategies available to the group. This sudden decrease in the organization's ability to employ the strategy that best guarantees its survival will provide an incentive for the group to seek a more favorable geographic location.

It is not only the reduced menu of tactics/strategies that likely push rebels away from locations in close proximity to where interstate conflict has occurred. Indeed, with the birth of an external threat comes an increased likelihood that the regime in question will begin

to increase state repression as a direct consequence (Regan and Henderson, 2002). This is especially true of regimes experiencing civil wars at the same moment in time, as a segment of the population already has the means and willingness necessary to fight. Thus, interstate conflict not only has the potential to produce an influx of government resources to a specific area, but it also makes the government more apt to target rebels and those who they perceive to be affiliated with them.

Militarized interstate conflict that occurs in close proximity to the geographic space being used by rebels, therefore, will constitute a negative shock.[12] From this, the following is derived:

Hypothesis 8 *Interstate conflict that occurs in close proximity to the territory occupied by rebels will be associated with rebel relocation.*

Per the theoretical logic outlined previously in this chapter, the level of civilian victimization that occurs as a direct consequence of relocation is conditioned by group strength. Weaker organizations who are forced to cope with a negative shock are predicted to be more likely to increase their attacks on civilians because of growing uncertainty surrounding security and resource acquisition. Stronger organizations, on the other hand, are more capable of coping with relocation that occurs as a consequence of negative shocks because of their ability to militarily compete with government forces, as well as the relatively large portfolio of resource acquisition options. From this, the following hypothesis is proposed:

Hypothesis 9 *Movement that occurs because of interstate conflict will be associated with an increase in the use of violence against civilian populations by weak rebel organizations.*

2.5.2 International Peacekeeping Deployments

The bulk of the literature on international peacekeeping seeks to determine whether this conflict management strategy is successful (see Fortna, 2003, 2004, 2008, for examples). In

[12]The exception to this expectation are cases in which a third-party state initiates a conflict on behalf of the rebels.

other words, does the deployment of peacekeepers to a given country lead to the cessation of violence, which in turn, might make the settlement of the conflict more likely? Or, if a some form of settlement has already been reached, do peacekeepers assist during the implementation of a ceasefire or peace agreement? As is appropriate given the question at hand, this work is at the state-level as it is concerned with the outcome of civil conflicts.

Disaggregated work that does look at *where* peacekeepers are deployed are relatively rare, but are becoming more common in the literature. By shifting the unit of analysis away from the state and to a lower-level of analysis, scholars are able to explore several new questions. The first, and perhaps most fundamental, is where are peacekeeping sent within a country once a mission is approved? Using data from the Democratic Republic of the Congo, Townsen and Reeder (2014) find that peacekeeping forces tend to target violent events that are most related to their mandate – namely, battles between rebels and government forces and areas where civilians are being victimized. This finding is consistent with the work of Powers et al. (2015), who find that peacekeepers cluster spatially around rebel-government battles and where violence against civilians have occurred. Finally, Costalli (2013) looks to see whether or not peacekeepers are effective at the local-level and finds that they are.

The issue with the work cited above is twofold. First, despite the availability of data that is recorded daily, all three studies temporally aggregate the data and conduct their analyses yearly. Much is lost in this decision, as the inferences made are subject to criticism. It is difficult to say, for instance, that peacekeepers cluster to violent events when there is a real possibility that the peacekeepers arrived *before* the violent event was observed. Second, there is no distinction made among different actors. The focus of disaggregated work is on 'violence' and does not seek to account for which specific actors were involved. The underlying assumption, therefore, is that violence is created equal and that no variation should be expected regardless of who is involved in the act.

For the purposes of the theoretical logic presented here, the timing of violent events and the arrival of peacekeeping forces is vital in understanding how site-specific deployments

might influence local conditions (i.e. has the potential to produce *local shocks*). As is information about which specific groups are in close proximity to the deployments, because the subsequent reaction is apt to be conditioned by group strength. Finally, the specific aims of the peacekeeping deployments are likely to be important as well – those whose aim is to disarm a group, or prevent it from operating in a certain way, will likely influence rebel behavior much differently relative to those that are simply monitoring missions. It is important, therefore, to differentiate between the purposes of different deployments in order to understand the potential influence on the localities occupied by rebels.

In accounting for the timing, specific groups involved and stated purposes of peacekeeping deployments, there are two ways in which the arrival of peacekeepers might influence rebel behavior. First, peacekeepers might be perceived as a source of security that can be exploited. In this scenario the arrival of peacekeeping forces is a *positive shock*, as they increase the likelihood of survival by improving levels of physical security. By remaining near the locations where peacekeepers have been deployed, rebels can begin to rearm, recruit new members, and seek out new resources that might be available nearby. From a spatial perspective, this means that we should expect weak rebel organizations to cluster near peacekeepers.

This should only be the case, however, if the specific purpose of the peacekeeping mission is not a serious threat to group survival. When group survival is put at risk by peacekeepers, because they are attempting to disarm or otherwise reduce the ability of the group to defend itself, a *negative shock* is the likely result. Group strength is also important in this discussion, as there is a stronger incentive for weaker organizations to exploit the security offered by the presence of peacekeepers. Stronger organizations, on the other hand, have little need for security as they have the ability to confront their adversary militarily and win. From this, the following empirical expectation is derived:

Hypothesis 10 *Peacekeeping deployments near weak rebel organizations will be associated with less movement across geographic space.*

Contrary to weak rebel organizations, strong groups do not view peacekeepers as a significant source of security. Nor is there a need to shelter their group from the national government in the same way that weak organizations must in order to survive. The reason is the power of stronger organizations relative to the national government, and the limited ability of peacekeeping troops to use force. Even if peacekeepers are deployed in an attempt to rein in rebel aggression, for example, the targeted group usually has the resources necessary to avoid being limited by the presence of peacekeeping forces. The RUF in Sierra Leone, for example, were able remain near diamond mines while simultaneously threatening the capital upon the arrival of peacekeeping forces in 1999. This was because they were occupying a large geographic area, which means that they were able to move away from peacekeeping forces when it served their goals, and return when necessary to obtain resources (Hazen, 2013).[13] Peacekeepers in this instance, therefore, were much more of a nuisance than a real threat to the goals and ambitions of rebels.

This implies that there is no real incentive to relocate when peacekeepers are deployed near strong rebel organizations. Rebels might choose to move away from a portion of the territory that they occupy, but complete abandonment of a geographic space is unlikely. This is especially true if the purpose of the deployment is to monitor activity, or some other action that does not seek to directly undermine the ability of an organization to behave as they prefer. Thus, peacekeeping deployments near strong rebel groups are unlikely to produce a *local shock*, and if it does, it is not likely to be great enough to warrant relocation.

This does not mean that peacekeepers are inconsequential to rebels, as deployments near the group might lead to logistical problems that can become a significant concern. Indeed, one of the core activities is the monitoring of events that transpire at a given location. This means that peacekeeping forces will likely be apt to track rebel movement, which in turn, might allow for the deployment of peacekeepers to new locations that the group would prefer to operate from free from the restraints imposed by the external actor. In addition,

[13]Hazen (2013) attributes this to military training.

patterns of civilian support for rebels might be fundamentally altered by the presence of a peacekeeping force. This is likely to occur for the sake of security, as individuals would likely prefer not to be identified as being sympathetic to rebel forces (especially if a government victory is plausible). Instead of suffering the costs associated with relocation, therefore, rebels should instead seek to force peacekeepers away from the areas that they occupy. This is because this option imposes much less risk on the group relative to the complete abandonment of an area.

The most efficient way to accomplish this is to signal to commanders on the ground, the national government and the international community, that the mission is not effective. This might lead to a number of different shifts in the behavior of rebels, but the most likely is an increase in the use of violence against civilians. Preventing these attacks is often one of the most central goals of a peacekeeping mission, which means that by taking part in these actions rebels can undermine the mission – a simliar tactic used when rebels seek to undermine a democratic regime during war (Hultman, 2012). This should only occur, however, when the goal of specific deployments is to monitor activity in the area in order to minimize casualties. The expectation is that creating the perception that peacekeepers are unable to accomplish what they set out to do will reduce the likelihood that peacekeepers will remain at that location in the future.

This tactic might have consequences, however. An increase in the use of violence targeting civilians might lead to an influx of peacekeeping forces. The ability of peacekeepers to monitor, or directly target the group, will increase dramatically as a consequence. During these moments, in which peacekeepers are seeking to directly undermine the ability of a strong rebel organization to behave in the manner they would prefer, a strong incentive to raise the costs associated with deployments is born. This is accomplished by targeting peacekeepers with violence, in the hope that fatalities will lead to withdrawal (Salverda, 2013). From this, I derive the following:

Hypothesis 11a *Peacekeeping deployments that occur near strong rebel organizations will*

be associated with the use of violence against peacekeeping forces.

Hypothesis 11b *Peacekeeping deployments that occur near strong rebel organizations will be associated with an increase in the use of violence against civilian populations.*

2.6 Looking Forward

The next chapter outlines the empirical approach that will be used to test the hypotheses developed in this chapter. In particular, the method chosen to estimate rebel group location will be discussed in detail, as will the manner in which the variables of interest will be operationalized. Special care is taken during this process to be explicit about the limitations of the chosen empirical strategies.

In Chapter 4 the hypotheses concerning the locations chosen by rebels, as well as under what circumstances armed non-state actors are likely to move, are empirically tested. This will lead into Chapter 5, where rebel relocation and civilian victimization are linked by testing the notion that *negative shocks* will lead weak organizations to resort to using violence against civilians in order to acquire resources and survive during movement. The suspected curvilinear relationship between violence against civilians and movement across geographic space is also explored in this chapter. Finally, Chapter 6 will test the relationship between two transnational sources of local shocks and shifts in rebel behavior (in terms of movement, the use of violence against civilians, the use of violence targeting peacekeepers, and conflict diffusion).

The final chapter of the dissertation, Chapter 7, will summarize the findings and discuss them in terms of the current literature on political violence that takes place in the context of civil wars. During this discussion, special care will be taken to link these findings to existing work. In addition, several direct extensions will be outlined that can further our understanding as to why civil conflicts evolve the ways in which they do.

Chapter 3

Research Design

This chapter outlines the research design that will be employed in this study. The first part of the chapter will provide an overview of the spatial and temporal domain. It is during this process that the method used to estimate rebel location is introduced and described in detail. The second section of the chapter deals with measuring the concepts under consideration – or, stated differently, focuses on the variables (dependent, independent, and control) that are used in the empirical models. This is followed by a brief introduction to the empirical models that are used for the purposes of this study. In describing these statistical approaches, a 'neighbor list' is also described. It is this component of the tests that captures and/or controls for diffusion effects. Finally, some limitations of the research design are discussed.

It is worth noting that this chapter does not discuss every potential detail of the empirical models. Most notably, more details about specific model specifications are provided in the relevant empirical chapters. This allows these decisions to be justified in the context of the hypotheses under consideration.

3.1 Spatial and Temporal Domain

In order to test the hypotheses outlined in the previous chapter, I construct a spatially-referenced dataset that includes every organized rebel group in Africa on a month-to-month basis from 1990-2010. The only groups included are those that are deemed by the UCDP Actor Dataset to be formally organized.[1] These are rebel organizations with a formally

[1]See www.pcr.uu.se/research/ucdp/datasets/ for more information.

announced name that have a relatively high level of group organization. Less-organized insurgent movements are dropped because the decision about where to base operations is less likely to be strategic due to limited coordination among members, as well as a general lack of centralized leadership. The result is a dataset that includes a total of 3568 rebel group months, which is the unit of analysis in the study. In total, there are 193 organized rebel groups represented (including splinter groups).[2] A majority of these groups only appear in the data for a few months, but all of the major organizations that were active in civil conflicts for a prolonged period of time are included as well. Per the method described below, the dataset also includes an estimate of *where* each rebel group was located during every month of the study period, as well as a measure of how much geographic space was occupied.

Information pertaining to rebel group behavior during periods of civil conflict is taken from the UCDP Georeferenced Event Dataset (Sundberg and Melander, 2013). This data project records every violent event that takes place in the context of an ongoing civil conflict, as defined by the 25+ battle death threshold. In addition, events are disaggregated based on the type of event and also includes information about how many people were killed.[3] I subset the data based on the non-state group involved in the event. This information is then used to determine where each rebel group was located for each month during the study period.

The method that provided me with the most data, because a relatively high threshold of events need not be met during each period, was home-range analysis.[4] Home-range analysis is predicated on the observation that animals tend to restrict their movement to finite areas. Or, as articulated long ago by one prominent ecologist, "No wild animal roams at random

[2]A list of these groups can be found in the appendix.

[3]The three event types are state-based violence (rebel-government confrontations), non-state violence (rebel-rebel confrontations), and one-sided violence (rebels or the regime attacks unarmed civilians).

[4]This is done in two different ways, with each serving as a robustness check for the other – I use geographic criminal targeting (CGT) and home-range analysis. I only describe home-range analysis in this chapter because the models reported use this method. This extent of differnece was estimated by calculating the percentage of the resulting polygons that overlapped. This value ranged from 83.23%-95.31%, which seems to indicate that little difference exists when applying these methods to rebel groups.

over the country; each has a home region, even if it has not an actual home" (Seton, 1909). According to this logic, a home-range is the geographic space that a given species uses to find security, resources, and to maximize the probability of survival (Krebs and Davies, 1997). These locations are not chosen at random, but evolve alongside the environment and the needs of the species under consideration. If there a fundamental shift in the availability of resources, for example, the habitat is apt to expand or move entirely. In this sense, a habitat is the location at which a sufficient amount of resources is available to support the group. If the level of resources becomes insufficient for the purposes of survival, finding a new location that meets this requirement is necessary.

Though rebel organizations are much more complex relative to animal populations, there are two core similarities that make applying this technique to armed non-state actors possible from a methodological perspective. First, like animal populations, the locations chosen by rebel organizations are not random but are a strategic decision made by group leaders and thus have an underlying spatial structure. The Revolutionary United Front in Sierra Leone, for example, actively sought out forested areas that were proximate to diamond mines (Denov, 2010). This provided them with a sense of physical security and access to a valuable natural resource that served as an important source of wealth. This implies that not only is it possible to determine where these groups are located, but it is worthwhile to investigate why one location is chosen over another.

Second, like animal populations, rebels are forced to seek out 'habitat' that is conducive to their survival. Though this habitat must contain more than just food sources, there is strong evidence that specific geographic features are attractive to armed non-state groups currently embroiled in conflict.[5] These locations are also likely difficult to find and protect, as there is an incentive on part of the government (and perhaps other actors) to prevent rebels from occupying these areas. Like animal populations, therefore, there is a constant need to

[5]This is evident by the large body of literature that explores the role of natural resources and rough terrain in the onset of civil conflicts.

adapt when location conditions change. The Revolutionary Armed Forces of Colombia, for example, have undergone several transformations. Most of which have been the direct result of being forced from locations via government pressure, where they were then relegated to acquiring access to resources in new areas (Metelits, 2009).

In animal studies, determining where a species is located requires reliable information about spatial distributions during the study period under consideration. In contemporary research, this usually involves the use of GPS technology as it has the ability to monitor and record animal locations at regular intervals. We do not have the ability to monitor rebel groups in this way, of course, but the UCDP Georeferenced Event Dataset does include information about when and where insurgents are involved in violent actions.[6] These events serve as a proxy for the footprints found in the snow, human recordings of animal locations, and/or GPS coordinates obtained via radio collars – common sources of data in the ecology literature. This allows for the use of a habitat identification method that is common in the animal studies literature that relies on kernel density estimation to derive utilization distributions (Worton, 1989).[7]

Utilization distributions, as usually calculated, estimates the probabilities of where an animal might be found at a chosen moment in time. As evident by the literature, this technique allows one to estimate animal preferences for different types of landcover, the likelihood that different species overlap, and the effect of topography on home-range locations (Horner and Powell, 1990; Mitchell et al., 2002; Fieberg and Kochanny, 2005; Ryan et al., 2006). One documented shortcoming of utilization distributions is the underlying assumption that the probability of spending time in a certain location is a measure of the importance of that place to the animal in question, which is not always true when looking at some animal

[6]There are several instances in which the duration of an event was longer than a single day. In order to account for this, I expand the data based on the duration of each event. A battle between government and rebel forces that was recorded as taking place from July 2-July 7, for example, is expanded to 6 events (one for each day the event was ongoing).

[7]This method is best-suited for the problem at hand, as other approaches assume large numbers of observations via GPS technology.

populations. This assumption is actually an advantage when applying the technique to rebel organizations, however, as rebels will be choose locations that emphasize security and access to vital resources (e.g. important) because the alternative would prove to be far too costly. It is also notable that the notion that home-range estimation techniques can be applied to human beings is not new (see Powell and Mitchell, 2012, for an example). Humans are a product of their social and physical environment, which means that we each have our own habitat – the geographical area where we work, go to school, purchase food and clothing, exercise, among other activities.

In building a utilization distribution model, the use of space of the rebels in question is described by a bivariate probability density function, which gives the probability density that the group will be present at any place during the time period under consideration (in this case, each month). This is accomplished by placing a bivariate kernel function over each observed location. The values of these functions are then averaged together. Though the choice of kernel function does not greatly influence the estimates, I choose an Epanechnikov kernel as it has been shown to be more efficient (Wand and Jones, 1995). In terms of bandwidth selection (size of the kernel function), I use what is referred to in the literature as the 'reference bandwidth.' Because I use an Epanechnikov kernel, this value is multiplied by 1.77.[8] Doing so is necessary when using an Epanechnikov kernel in the context of habitat analysis because it helps increase the probability that the resulting surface is consistent with the data (Silverman, 1986).[9]

This technique is used to create home-range profiles for each rebel organizations for each month that they were active. Figure 3.1 contains an example month, with each color/polygon representing a different rebel organization. These estimates are then attached to each observation, which is why the data in question are referred to as being spatially-referenced.[10] As

[8]Note that this technique assumes the presence of a single home-range. There is an alternative option, least square cross validation (LSCV), but this option is too computionally intensive to apply so broadly.

[9]Consistent in the sense that the surface will not be over or under smoothed.

[10]These home-range profiles will be made available for download after the completion of the dissertation project. In preparation, an R package entitled rGIS has been developed that allows for the data to be

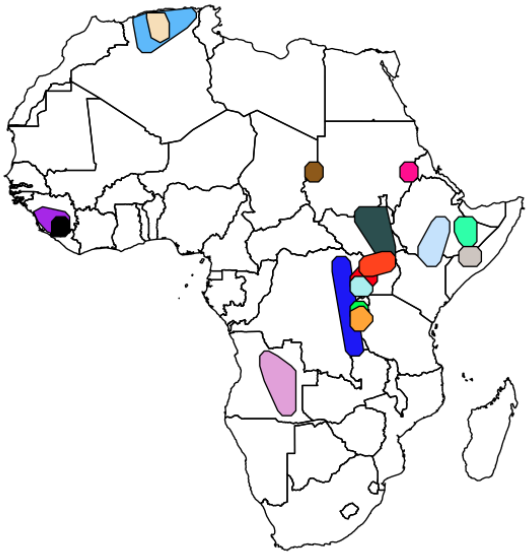


Figure 3.1: Rebel Group Home-Range Profiles, January 2001

is described in greater detail below, this information allows for the extraction of information at the local-level, which provides a much more nuanced account of rebel behavior in the context of an ongoing civil conflict.

3.2 Measuring Concepts

This study is concerned with estimating the influence of local-level conditions on shifts in rebel behavior during civil conflicts. In order to build empirical tests that are able to capture this variation, it is necessary to measure various aspects of rebel behavior (dependent varaibles) and the characteristics of the local environment occupied by rebels (independent varibles). Finally, there is a need to measure the international sources of behavioral change – interstate conflict and international peacekeeping (additional independent variables). Regarding rebel behavior, measures of violence against civilians, rebel movement, rebel violence against peacekeepers, and rebel expansion/conflict diffusion are developed. These four variables will serve as the dependent variables in the empirical models. Local-level conditions

accessed. In addition, the functions used to create the profiles are also available so that they may be applied to other event data.

are accounted for empirically by creating a spatial index of geographic space that is conducive to rebel behavior. This index includes nine different covariates, each representing either physical security or an important resource. This index is then used to operationalize the concept of *local shocks*, as well as in making a distinction between *positive* and *negative shocks*.

In addition to outlining the dependent and independent variables of interest, this section also describes several control variables that are included in the regression models. These include information taken from existing datasets that account for group-level factors, as well as geographic information that was used to construct the spatial index referenced above.

3.2.1 Dependent Variables

Movement and Spatial Expansion

In order to create the dependent variables that are concerned with the geographical locations occupied by rebel organizations, I use the home-range profiles produced via habitat analysis. First, regarding the movement of rebels across geographic space, I take the centroid of the home-range profile at time t and calculate the distance to the centroid of the home-range profile at time $t + 1$. In order to be considered movement, the group must be in the dataset during consecutive months; otherwise, the movement variable is coded as missing. Of the 3568 rebel group months, 2714 were recorded during consecutive months. This means that in 854 instances this variable is coded as missing. The range of movement for the 2714 rebel group months is 0-1168.26 kilometers. The mean movement is 101.48 kilometers, whereas the median distance is 51.23 kilometers. The natural log of this variable is used due to skew.

The same method is used to measure the extent of rebel expansion/conflict diffusion. Specifically, the area of each home-range profile at time t is subtracted by the area at time $t + 1$. The result is the change in the geographic size of the area occupied by rebels on a month-by-month basis from 1990-2010. Like the movement dependent variable, this measure

is only included if the group in question was active during consecutive months. Otherwise, it is coded as missing. Of the 3568 rebel group months, 2714 were active during consecutive months. The range of the value for the study period is -16858.59-13214.68 kilometers. The mean change in the geographic area is -5.32 kilometers, and the median value is 0.

Violence Against Civilians

Though there are several potential ways in which a rebel group might choose to behave, this study emphasizes a group's propensity for violence and locations that these groups occupy. In the case of the former, there are three potential ways to proceed – event counts, battle deaths, or a combination of the two. Using the same information that was employed in order to construct home-range profiles for each group (Sundberg and Melander, 2013), I choose to develop a measure of violence that accounts for both the frequency of violent events and the number of people killed. This avoids the real possibility that two events in which no one was killed is deemed to be more 'intense' relative to a single event where 100 people lost their lives. In addition, the fact that the data being used is geo-coded makes it possible to use a method that can also account for the spatial clustering of events. The resulting measure, therefore, assumes that locations where numerous events took place, people were killed and other events were nearby, experienced high levels of political violence relative to locations that lacked one (or all) of these factors. The inclusion of clustering is not controversial, as the influence of violence on behavior at a given location is apt to increase as the proximity to violent events decreases. Or, simply stated, rebels organizations are likely to take note of an increase in political violence occurring nearby their current location.

The chosen method to create this measure is kernel density estimation. This spatial method uses a point pattern, which in this case is the known locations of violent events, to estimate the 'intensity' of a events across the study area. The intensity value of the point pattern is constructed in such a way so that higher values indicate more violent locations, whereas lower values are assigned to areas where less violent activity was observed. Creating

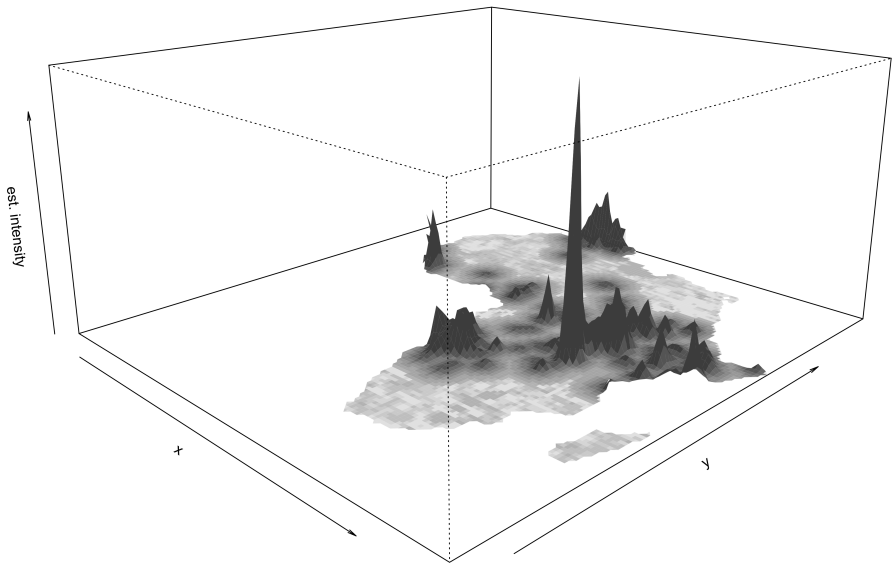


Figure 3.2: Intensity of Violence in Africa, 2001

these local-level intensity measures via kernel density estimation is accomplished in three steps. First, the point pattern under consideration is overlaid across the study area (in this case, Africa). In the context of this study, this is done for every group for each month that they were active. Second, a series of grid cells are placed over the study area and the point pattern in question. Finally, the kernel visits the centroid (i.e. center) of each grid cell and calculates the 'intensity' of the events at that location based upon the number of points in the cell, as well as the surrounding grid cells.[11] The result is a spatial surface that estimates the intensity of violent events at the local-level – an example of which can be seen in Figure 3.2. In the figure, the peaks are those locations where high 'intensity' of violence was estimated, whereas the valleys are those locations with little (or no) episodes of civilian victimization.

In employing this method to measure the propensity for group violence, I subset the

[11]The shape of the kernel means that those events in surrounding grid cells are given much less influence on the resulting measure vis-a-vis those that are in the grid cell in question.

data based on the group and the type of event. I also weigh each point by the number of people killed, which means that the influence of a given spatial point on the creation of the intensity measure will increase as the number of people killed during the event increases. In the context of the use of violence targeting civilian populations at the hands of rebels, the range is 0-183680.4, the mean value is 1739.07, and the median value is 0. Note that when creating this measure, only those events in which rebels attacked civilians are included – instances in which government forces were the responsible party are dropped from the data.[12] Because this variable is skewed, the natural log is taken in order to correct for this.

Rebel Violence Targeting Peacekeepers

Data pertaining to rebel violence targeting peacekeepers is taken from the replication data for Salverda (2013). The variable is a dummy variable that is coded as a 1 if the rebel group in question attacked peacekeepers; otherwise, it is coded as a 0. The rebel groups that are not encompassed by the temporal or spatial domain of the study done by Salverda (2013) are assigned missing values. When combining this information with the spatially-referenced data created for this project, there are 70 rebel group months in which violence was used against peacekeeping forces by rebels. There are 170 rebel group months in which no violence was used.

One important limitation of this data in the context of this study is the fact that the data are recorded annually. Thus, a rebel organization is coded as targeting peacekeepers for an entire year, even if the attack occurred during a single month. Though this is less than ideal, the data are indeed capturing rebel organizations that have displayed a propensity for this type of action in the past (or, in some cases, will in the future).

[12]Variables were also created to measure battles with government forces and battles with other rebel groups. Though, these are not used in this study they will be used when extending this project.

3.2.2 Independent Variables

The independent variables of interest deal with the local conditions experienced by rebel organizations on a month-to-month basis during a civil conflict. I explore each local-level factor in isolation, as well as the interaction among them by creating a spatial index of geographic space that is conducive to rebel behavior. In order to aggregate these variables to the group-level, I extract the values that are found within each home-range profile that is attached to each observation. In doing so, I take the mean value of each measure in order to control for the size of the territory occupied by rebels.[13] The descriptive statistics presented below, therefore, are the values extracted from the various rebel organizations and not the global values taken from the entire study area.

Local-Level Factors

The local-level factors that are available take one of three forms: constant, observed periodically, or date-specific event data. Of the nine local-level factors included in this study, three are constant in the sense that the data are only available for a single year. The first is a measure of forest density that was derived from a satellite image captured in 2005 (Sexton and Townshend, 2013). The data were then processed to create a single raster file that contains an estimate for the percentage of forest cover in each grid cell worldwide.[14] In order to be included in the estimate, a tree must have been greater than 5 meters in height. In addition, the forest cover measure incorporates all vegetation that is attributed to trees. This means that leaves, stems, branches, and any other object that provides cover are accounted for.[15] This is useful given the research question at hand, as it is the fact that these locations provide physical security that associates them with armed conflict. This factor, as mentioned above, is constant as it is only available for a single year. Though, it

[13] In order to do this, I convert each data source to raster data. The average that is calculated, therefore, is the mean of the grid cells that are found within each home-range profile.

[14] Raster data is spatial data that is a matrix of cells organized into rows and columns. Each cell contains a value representing the information under consideration.

[15] The range of this value in Africa is 0%-80%.

should be noted that the rate of global forest change is estimated to be around 0.6% per year (Hansen and Potapov, 2010). Thus, it is therefore unlikely that any dramatic changes occurred during the study period.

The second constant factor is the location and intensity of international borders. The data were acquired via Natural Earth, a collection of basic GIS-related data that are in the public domain.[16] I drop all ocean borders and only include land borders among states. In operationalizing this information for use in the study, I rely on kernel density estimation to estimate the intensity of borders at each location – intensity being the concentration (and thus availability) of international borders relative to rebel location. The logic behind this is the notion that those locations where several international borders intersect will likely be more secure relative to areas where only one border is present. The reason, which is discussed in the theoretical story, is that the rebels will have multiple options in place, and will still be able to find security if one of the states decides to close off its border.[17] Finally, using kernel density estimation is also useful because it allows for a gradient effect. In other words, a rebel organization need not be located directly on an international border. Rather, the security provided by the border decreases as the distance to the border increases, but there remains a security-enhancing effect when nearby (and not directly contiguous to) a border region (see Figure 3.3 for a visualization of this variable). The range of values for this variable is 0-11.65, the mean is 5.72, and the median is 5.29.

The third and final constant factor is elevation. As described in the theoretical story, elevation is predicted to be associated with the presence of armed non-state groups because of the difficulty associated with traversing mountainous regions. This difficult makes projecting state power difficult, and also increases the likelihood that rebels will use locations at higher elevations as a base of operations because of the security that is provides. The data for this conflict-related factor were taken from the CGIAR Consortium for Spatial Information

[16]See http://www.naturalearthdata.com/about/terms-of-use/ for more information.

[17]In the civil war literature, this is usually understood as an attempt to deter externalization or spillover events from taking place (Gleditsch et al., 2008).

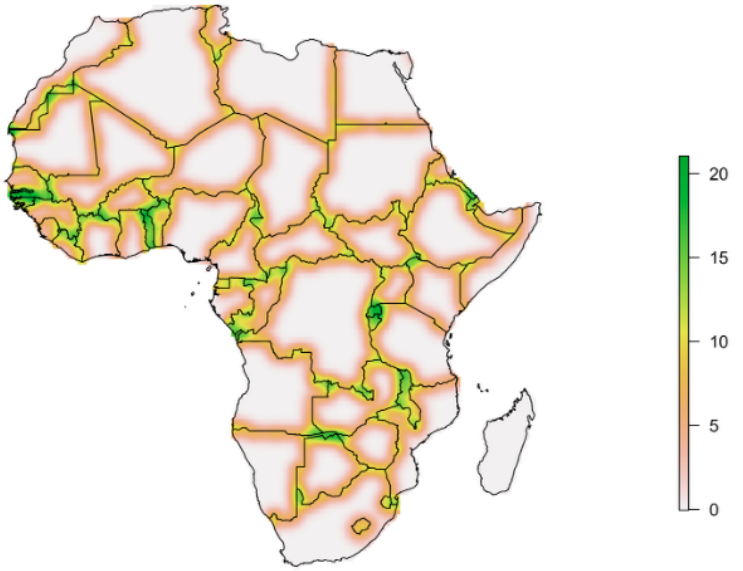


Figure 3.3: Intensity of International Borders of Africa

(version 4).[18] This data project used data collected by the NASA Shuttle Radar Topographic Mission (SRTM) and added all missing information around the globe. The result is raster data that contains the elevation for 5 x 5 degree grid cells around the world. In conducting a series of case studies in order to evaluate the quality of the data the authors find it not only to be accurate, but also a modest improvement to other data sources available.[19] In addition to elevation, I also create a measure of slope (the rising or falling of the surface) and find no statistically significant difference between these two measures in the statistical models.[20] The range of elevation when looking at rebel organizations is 19.14-2185.36 feet above sea level. The mean value is 751.12 feet and the median is 722.61 feet.

Like the constant factors described above, three of the nine local-level factors used in the study were observed periodically. The first is the intensity of lights that can be seen from space, which in this study serves as a proxy for state capacity and economic development. This is not a new idea, as these data have been shown to be highly correlated with industrial

[18]See http://srtm.csi.cgiar.org/ for more information.
[19]This report can be found at: http://srtm.csi.cgiar.org/PDF/Jarvis4.pdf
[20]Because of this, I choose to report the findings using elevation in this study.

activity and gross domestic product (Small and Elvidge, 2005; Doll and Morley, 2007). The data are available via the NOAA's National Geophysical Data Center,[21] and contain lights from cities, towns, and other sites with persistent lighting. I use the satellite images from 1993, 2003 and 2010 and use interpolation to predict the values for the missing years. In doing so, I assume a normal growth curve for each year in which the values are being predicted. Using this method, I am able to derive yearly changes in the intensity of night-time lights from 1990-2010.[22] The result is a series of raster files in which each grid cell contains the percentage of the cell that contains lights, which are then extracted from each home-range profile estimated for rebels. The range is 1.98%-15.26%, the mean is 2.46%, and the median is 2.22%.

The second factor, which also required spatial interpolation, is active croplands. They are 'active' in the sense that they produced some crops during the observed period. This data were acquired via Earth Stat, a collaborative project between McGill University and the University of Minnesota to study agricultural issues globally.[23] The cropland data available is an expanded version of the data presented in Ramankutty and Foley (1999), and includes the location and intensity of croplands from 1700-2007. In order to predict the missing years, I take the mean change at each location in Africa over the 1990-2007 period and use that value to predict the missing 3 years (2008-2010). In other words, I assume that the trend observed during the years that will be included in the study hold for the final 3 years at each location. Extracting these variable using the home-ranges profiles produces the percentage of rebel territory that contains croplands. This value ranges from 0%-77.19%, the mean value is 11.53%, and the median is 8.27%.

The same data source cited above also contains information about pasturelands. These are locations where domesticated livestock are grazed. Per the definition, the land is usually available to livestock with minimal effort by humans. This is in contrast to meadows or

[21]See http://ngdc.noaa.gov/eog/ for more information.
[22]The only exception to this are the years 1990-1993. During these years the values for 1993 are retained.
[23]See http://www.earthstat.org/ for more information.

Table 3.1: Summary of Local-Level Variables Included in Study

Variable	Type	Interpolated?	Years Available
Forest Density	Constant	No	2005
International Borders	Constant	No	2010
Elevation	Constant	No	2012
Night-Time Lights	Periodic	Yes	1990-2010
Croplands	Periodic	Yes	1990-2010
Pasturelands	Periodic	Yes	1990-2010
Diamond Mines	Date-Specific	No	1990-2010
Government Repression	Date-Specific	No	1990-2010*
Political Expression	Date-Specific	No	1990-2010*

* available monthly

other land cover, where they are usually only available for use after being made suitable for animal habitation (significant maintenance is also required). Like croplands, pasturelands have the potential to provide rebels with vital food supplies that are necessary to continue to rebellion. Using this information in combination with the home-ranges profiles provides the percentage of rebel territory that contains pastures. The range of this variable is 0%-80.21%, the mean is 29.77%, and the median is 23.66%.

Finally, three of the nine local-level factors used in this study are date-specific event data. These are data sources that provide information about the specific location and date that a particular spatial point appeared. Information about the first local factor, the location of diamond mines, was taken from the DIADATA project (Gilmore et al., 2005). This data include the location of diamond mines, the date that they appeared, and distinguishes between primary and secondary diamonds. As the authors note, this distinction is important because secondary diamonds are easier to gain access to and are thus more apt to be looted by rebel forces. In order to account for this important difference, I create a weight for secondary diamonds that gives those locations 50% more influence relative to primary diamonds when calculating the intensity measure via kernel density estimation. Because this intensity measure is used to estimate how conducive a given location is to rebel activity, this is an appropriate method as rebels are more apt to prefer secondary over

primary diamonds.[24] The range of diamond intensity, when aggregated to the group level using home-ranges profiles, is 0-8.07. The mean value is 0.52 and the median is 0.

The final two date-specific event data used to account for local-level conditions come from the Social Conflict in Africa Database (Hendrix and Salehyan, 2014). First, in order to account for government repression, I create kernel density estimate every month from 1990-2010 that only includes those events in which a national government responded to anti-state activity with repression. In producing these monthly measures I weigh each spatial point by the number of people killed at each event.[25] These forms of events, especially if they are severe, are predicted to push rebels away from the area in question. The range of the intensity of repression when aggregated to the group-level is 0-1.71, the mean is 0.01, and the median is 0. Second, I also create a measure using the same method that includes every incident in which anti-state activity occurred but no government repression followed. Events that take this form are predicted to signal anti-government sentiment, which is likely to be attractive to rebels during periods of civil conflict. Like the intensity measure created for government repression, I also weigh each spatial point by the number of people killed at each event.[26] The range of the intensity of these events is 0-9.79, the mean is 0.19, and the median is 0.01.

Spatial Index

In addition to being tested in isolation, each of the factors above are used to construct a spatial index of geographic space that is conducive to rebel behavior. This index will allow this study to investigate how these various factors might interact, which is important in

[24] As a robustness check, I also create this variable by using different weight schemes. There is no difference when altering this weight.

[25] Note that in the data deaths are only observed when a regime responded with repression. This strongly implies that a) either a government response leads to the escalation of violence, or b) government forces are actually doing the killing. Given the empirical evidence, the latter is most likely.

[26] Though, as described in the previous footnote, this is rare. An alternative would be to weigh each point by the number of people involved in anti-state activity, but this information is missing for a large proportion of the observations.

understanding why rebels choose the locations that they do. A location that has access to diamonds *and* is heavily forested, for example, is likely to be more attractive to armed non-state groups vis-a-vis another location with only natural resources. 'Conducive' in this context, therefore, refers to those locations that contain a favorable balance of physical security and access to the resources necessary to continue the rebellion. Rebels prefer to occupy these locations because doing so greatly increases the likelihood of group survival. It also improves the probability that the group will be able to act in accordance with the goals of the rebellion, which makes a preferable outcome more likely.

With regard to the local-level factors considered in this study, I use the civil war literature to derive the local-level factors that are apt to make a certain area conducive to rebel activity.[27] First, in terms of those factors that provide a sense of physical security, I assume that rebels prefer densely forested areas, the presence of international borders, and higher elevations. In addition, I believe that rebels will avoid areas where government repression is taking place, as well as locations where state capacity is high. In the case of those factors that provide vital and strategic resources, I assume that rebels prefer to operate near diamond mines, croplands, pasturelands, and those areas where anti-state activity is taking place but no government response has occurred. Those locations in which anti-state activity is present represent a hot spot of rebel recruitment, as well as a location where it might be possible to establish rebel-civilian relationships – though only when the regime signals that they are hesitant to exert influence on the area.

In order to construct this spatial index, I transform each data source described above into spatial quantiles – that is, each grid cell is assigned a value of 1-4 depending on how desirable each location is predicted to be to rebel forces. Notably, each quantile contains an equal number of raster cells. Grid cells that are assigned a value of 1 represent those locations most favorable to rebel activity, whereas 4 are locations that are are apt to be avoided by insurgent movements. In the case of government repression, for example, areas

[27]Note that these are discussed at length and cited in the previous chapter.

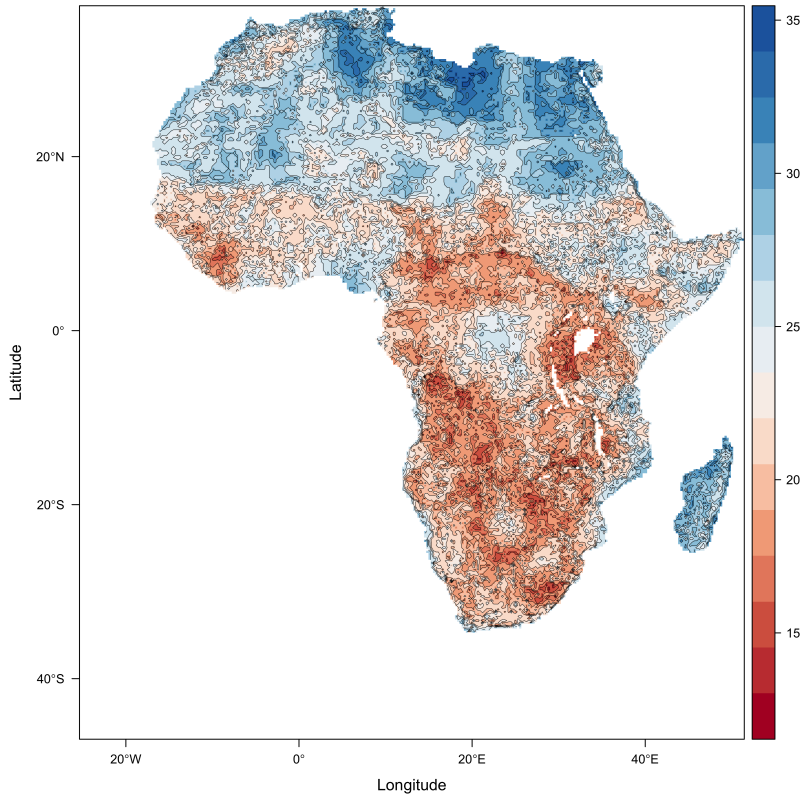


Figure 3.4: Spatial Index of Geographic Space Conducive to Rebel Behavior, January 2001

in which no repression is taking place is given a value of a 1, while the areas experiencing the highest levels are assigned a 4. The transformed data are then stacked together to form a single raster file. The sum in each raster cell is then taken to determine how conducive the location in question is to rebel activity. Aggregating this information up the the group-level using the home-range profiles produces an index with a theoretical range of 9-36, with lower numbers indicating locations more conducive to rebel activity. This is performed each month included in the study (see Figure 3.4 for an example from 2001). The range of the spatial index occupied by rebels is 15.64-32.11, the mean value is 22.33, and the median is 21.94.[28]

[28]In building this spatial index, I also took special care to construct an R package that will allow others to download the data. Entitled CSRaster, this package allows one to access specific components of the index, as well as construct their own spatial index using a chosen set of local-level factors. This will be released after the defense of the dissertation.

Local Shocks

This index is used as an independent variable in the statistical models, and is also important in operationalizing the concept of *local shocks*. Per the theoretical logic proposed in this project, a *local shock* is an instance in which the geographic space that a rebel organizations occupies is subjected to a sudden shift. In other words, there is a sudden change in either the push or pull factors associated with a given area. This will make the location more or less conducive to rebel behavior. Instances in which the geographic space becomes less favorable to rebel behavior are referred to as *negative shocks*, whereas cases in which an area becomes more conducive are referred to as *positive shocks*.

In operationalizing these concepts using the spatial index, the difference from time $t+1$ and time t are taken. A positive value indicates a negative shock, in that conditions have deteriorated for rebels at their current location. A negative value, on the other hand, indicates those moments in which conditions have improved. This information is used to create two variables. The first is the extent of negative shocks that have occurred – the range of this value is 0-12.84, the mean value is 1.31, and the median is 0.008. The second variable is the extent of positive shocks, which is derived from taking the absolute value of the difference variable when it is negative. The range of this variable is 0-14.22, the mean value is 1.28, and the median value is 0.004.

Rebel Group Strength

In order to determine rebel group strength relative to the national government, information is taken from the Non-State Actor Data (Cunningham et al., 2009).[29] Specifically, two variables are created. The first is a dichotomous variable that is coded as a 1 if the rebel group under consideration was equal to or stronger in terms of military strength relative to the national government; otherwise, it is coded as a 0. The second variable is a dichotomous

[29]This was released by David Cunningham, Kristian Gleditsch, and Idean Salehyan. It can be accessed at the following link: http://privatewww.essex.ac.uk/ ksg/eacd.html.

variable that is coded as a 1 if the rebel organization in question was weaker in terms of military strength relative to the national government; otherwise, it is coded as a 0.

Interstate Conflict and Peacekeeping Deployments

Finally, there is also a need to measure the location and intensity of two international sources of local shocks: interstate conflict and international peacekeeping deployments. In order to operationalize both variables, kernel density estimation is utilized (per the method described previously). In the case of militarized interstate conflict, version 1.1 of the Militarized Interstate Dispute Locations data are used to determine where each episode of interstate conflict occurred (Braithwaite, 2010). With temporal coverage up to 2001, this data project records the date and location of each militarized interstate dispute. Aggregating the intensity of interstate conflict to the location and geographic extent of each rebel organization produces a variable that ranges from 0-0.35. The mean value is 0.004 and the median is 0. Because the values are skewed, the natural log of the variable is taken for use in the empirical models. In addition, the values from 2002-2010 are coded as missing because the coverage is only up to 2001.

In order to account for the intensity of local-level peacekeeping deployments the same technique is used. Specifically, geo-coded event data are used that identifies the specific locations where peacekeepers were deployed during each month in Africa (Dorussen and Ruggeri, 2011). In many cases the deployment locations are coded to the capital because the necessary site-specific information was not available. During these instances, which constitute less than 3% of the total sample, the event is dropped because it is not 'local' enough.[30] Like the other variables, this information allows one to aggregate the intensity of the point pattern to the group-level by taking the mean value of the resulting grid cells that are found within rebel-occupied territory. The range of this value is 0-26.85, the mean

[30]Also note that events that were not deployments were dropped – such as those coded as the start of a mission, a meeting between combantants, among others.

value is 1.09, and the median value is 0.001. Because the measure is skewed, the natural log is used in the statistical models.

3.2.3 Control Variables

In order to control for group-level and state-level factors, I rely on the Non-State Actor Data (Cunningham et al., 2009). Covering the time period 1946-2010, the data provides information on the characteristics of armed non-state groups in relation to the government they are fighting (a dyadic approach). Because this is a direct extension of the Uppsala Armed Conflict Data, I am able to merge this into the home-ranges profiles as the same unique IDs are used. In addition, my use of the UCDP Georeferenced Event data means that the definition of a civil war used by the authors is identical to that employed in this study. Thus, data are available for every instance in which there is an going civil conflict in Africa during the temporal domain used in this study.

In addition to those variables taken from the Non-State Actor Data, the spatial index and individual local-level factors (cited above) are used to control for the characteristics of the locality utilized by rebels. In Chapter 4, each local-level factor is included to get a sense of how they might influence the dependent variables. In subsequent chapters, however, the spatial index is included as it is a combination of each of the local-level factors.

The controls taken from the Non-State Actor Data, and included in each equation, are as follows:

- *Secessionist Group*: A dummy variable that is coded as a 1 if the rebel organization in question is seeking secession. Otherwise, it is coded as a 0. Secessionist groups have been shown to behave differently than other groups, as they are attempting to achieve state recognition. This likely has implications for the various dependent variables used in this study, as they should be less likely to kill civilians and are also apt to remain stationary and protect the areas that they one day hope to govern. A discussion about

the incentives present for these groups can be found in Lasley and Thyne (2014).

- *Ethnically-Based Group*: A dummy variable that is coded as a 1 if the rebel organization in question was formed along ethnic lines. Otherwise, it is coded as a 0. This is an important control for the purposes of this study because ethnic wars tend to erupt for different reasons(Sambanis, 2001), which implies that they will evolve differently than non-ethnic wars. This is particularly salient for rebel group location, as ethnic groups that are receiving aid and support from their ethnic kin will likely choose to remain stationary and fight then relocate and put their ethnic group at risk.

- *Terrorist Group*: A dummy variable that is coded as a 1 if the rebel organization in question is widely seen as being a terrorist organization. Otherwise, it is coded as a 0. Unlike secessionist and ethnic groups, who have an incentive to remain at a given location, terrorist organizations benefit from remaining mobile. In addition, they have a keen interest in attacking civilian populations. As such, controlling for this type or organization is necessary.

- *External Support*: Indicates whether or not the rebel group in question is supported by the government of an external state. It is a dummy variable that is coded as a 1 if external support is being provided to the rebels; otherwise, it is coded as a 0. Rebel organizations that are being sponsored by a third-party behave differently than those who are not (Salehyan et al., 2011). As such, it is necessary to account for this factor when considering the behavior of rebels during wartime.

- *Territorial Control*: A dummy variable that is coded as a 1 if the rebel organization in question has explicit control over territory. Otherwise, it is coded as a 0. A group will be likely to remain stationary and suffer the costs imposed by a *negative shock* if they have become entrenched in the area. In addition, territorial control will likely impact patterns of civilian victimization – either because groups kill civilians in order to force

support, or kill fewer civilians because of an active working relationship.

In addition to controlling for these factors, I also take special care to address independence among organizations. Specifically, social networks are developed that include rebels that are in an alliance, as well as those organizations that can be characterized as splinter groups. A splinter group is deemed to be so because it was born directly from an existing group. It does not include those instances in which the original group ceases to exist. Rather, the group in question operates alongside the original organization. By developing a set of social networks that are able to allow related groups to interact in the empirical models, I am able to control for the impact that the behavior of one group might have on another. More specific information on how this was accomplished is found in the subsequent section that describes the neighbor list utilized in the statistical models.

3.3 Summary of Empirical Strategy

3.3.1 The Models

In Chapter 4, the empirical strategies used to explore rebel group preferences are presented. Specifically, ecological niche factor analysis (ENFA) is used to identify ecological niches that are utilized by rebel organizations. In doing so, the data are disaggregated based on rebel strength relative to the national government. This allows for an exploration into the differing preferences of strong versus weak rebel groups. In addition to borrowing this technique from ecology, spatial regression models are also estimated in order explore the influences of local shocks on rebel relocation. These models are estimated on the complete sample, and also sets of data that are subsetted based on group strength. The independent variables employed during this analysis are the measures for *negative shocks*, *positive shocks*, and the difference in the spatial index from time t to time t+1.

Chapter 5 continues this line of inquiry by exploring the consequences of relocation in

terms of civilian victimization at the hands of rebels. This is accomplished by estimating a series of spatial regression models. The first set of statistical models includes movement, the difference in the spatial index from time t to time t+1, and the measures for *positive* and *negative shocks* as the independent variables of interest. These variables are used to explain variation in the intensity of rebel attacks against civilian populations. The second set of statistical models are disaggregated by group strength, and include an interaction term that accounts for local shocks and rebel movement across geographic space. This approach is used to test the relationship between different forms of local shocks, relocation that occurs as a consequence, and the use of violence against civilian populations.

The final empirical chapter, Chapter 6, explores the relationship between transnational sources of local shocks and shifts in rebel behavior. The first set of statistical models are spatial regression models that seek to explain variation in the movement of rebel organizations. Measures of interstate conflict and peacekeeping deployments at the local-level are used to explain variation in rebel movement in various ways – including an interaction term between each of these variables and the forms of *local shocks*. The second set of models estimated in this chapter look to explain variation in the intensity of civilian victimization. The same independent variables that were utilized in the first set of models are included here, as well. In both sets, the models are estimated on the full sample and then sets of data disaggregated by group strength.

In the latter portion of Chapter 6, models are also estimated to test the relationship between the deployment of peacekeeping forces and other types of shifts in rebel behavior. Specifically, logistic regression models are estimated to explain variation in the probability of a rebel group using violence against peacekeepers. Like the prior models, the estimation is done on the full sample and disaggregated samples subsetted based on group strength. In addition, variation in the geographic size of the area occupied by rebels is used as a dependent variable. This done in order to determine if there is a relationship between peacekeepers and the diffusion of violence. These models are spatial regression models, which allows the

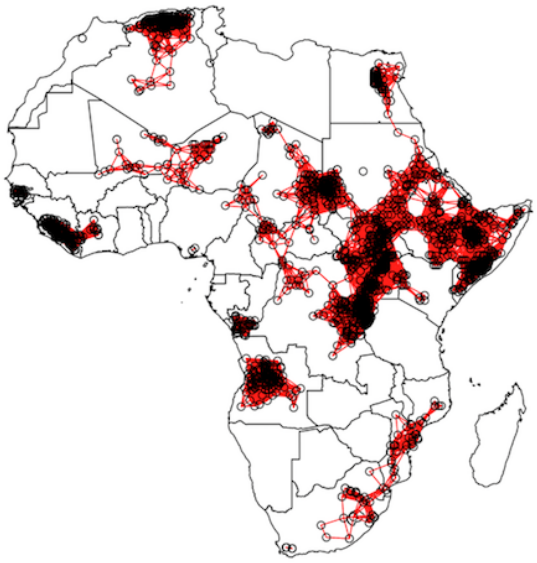


Figure 3.5: Visualization of Neighbor List Used for Spatial Regression Models

estimates to account for dependence among observations.

3.3.2 The Neighbor List (spatial weights)

As is evident from the summary of models, this project relies heavily on spatial regression models. The reason for this is that rebel organizations are likely influenced by other groups that are in close proximity. Or, on the other hand, those groups who they share a relationship with. This is especially true when attempting to explain variation in rebel location and movement, as the presence of other rebel organizations in close proximity would influence these decisions. If a weak group was looking to relocate, for example, it would be unlikely to do so if it would risk getting involved in a violent interaction with a stronger group. Similarly, a rebel organizations that is allied with another group would be unlikely to relocate if doing so would prevent them from acquiring resources and information from the allied organizations. In this sense, it is necessary to account for the distance between organizations *and* formal relationships that might be active.

Accomplishing this involves constructing a neighbor list, which is essentially how the

observations in the dataset are connected. For the purposes of this study, the neighbor list is constructed in such a way that any groups within 200 miles of one another are connected, as are those who are formally allied or deemed to be a splinter group that was born out of a larger organization (see Figure 3.5 for a visualization – the points are the centroid of rebel territory, whereas the red lines are the links). The percentage of nonzero links is 6.53, the average number of links is 232.94, and there are 4 rebel groups with 0 links. The average number of links is rather high, because the time-series nature of data mean that each group is also connected with itself for each month it appears in the dataset. This is actually useful, as it allows the value of the dependent variable influence subsequent values. Or, stated differently, it allows prior behavior exhibited by a rebel organization to influence the characteristics of subsequent behavior.

In creating spatial weights from this neighbor list, row standardization is used to create proportional weights because rebel organizations differ in the number of neighbors each is assigned. This process involves dividing each neighbor weight by the sum of all neighbor weights, and is useful in accounting for any potentially biasing features of the aggregation scheme imposed in this project. Using this spatial weights matrix, Moran's I tests are performed for each equation to confirm spatial autocorrelation. Once confirmed, Lagrange multiplier diagnostic tests for spatial dependence are estimated in order to determine which type of dependence is present. Then, the appropriate model is selected.[31]

3.4 Limitations and Robustness Checks

There are several limitations of the research design that warrant mention. First, the temporal and spatial scope of the empirical analysis is quite small when compared to contemporary studies of civil conflict. The fact that most studies emphasize state-level factors that are measured yearly allows for global analyses that include a significant amount of time (usually

[31]The results from these tests can be found in the appendix.

1946-2001, sometimes extended to 2008). This makes it possible to generalize the findings produced by these models across all civil conflicts in the post World War II period. This study, however, is limited to the African continent from 1990-2010. The only inference that can be drawn, therefore, pertains to how rebels behave during civil conflicts in Africa during the post-Cold War period. In many ways this is a worthwhile trade-off, as I examine the evolution of violent conflicts vis-a-vis an actor-centric approach for each month of the conflict (rather than annually). Thus, even though the temporal and spatial domain is limited, the level of disaggregation has the potential to offer new insight. This is because not only can short-term changes be explored in the context of intrastate violence, but so can the behavior of multiple groups embroiled in the same conflict.

In addition, this study acknowledges the limitations associated with many of the local-level factors used. Some local-level variables, such as forest density and night-time lights, are only available for a specific subset of years. This required me to make some assumptions about the variables in order to account for the missing values. In addition, most of the data are only available yearly. This is problematic in the context of this study because I am interested in exploring month-to-month variation as it pertains to the behavior of rebel organizations. When exploring the relationship between these local-level factors and rebel behavior individually, I am unable to account for this problem. In the context of the spatial index of geographic space conducive to rebel behavior, however, I am still able to use this information to build a monthly measure. Though, as is obvious, the variation that occurs is the product of only those factors that are available monthly. Thus, like most other data sources, what is available for use in this study is not ideal given the aims of this project. This fact does not mean, however, that scholars should ignore the influence of geography in the evolution of political violence in the developing world. Indeed, the findings that are revealed now can be verified/updated as data become more reliable in the future.

Chapter 4

The Location and Movement of Rebel Organizations

This chapter empirically tests the hypotheses that are concerned with addressing two fundamental questions born out of studying rebel organizations at the local-level. First, why do rebel organizations choose to operate from the locations that they do? And second, under what circumstances do rebels choose to take on the costs associated with relocation and move across geographic space?

As discussed in Chapter 2, the theory predicts that rebels will choose to occupy those locations that maximize their probability of survival. These are areas that are capable of providing armed non-state actors with physical security and access to important resources. The level of physical security provided at a given location and the amount of available resources, however, are subject to ebbs and flows over the course of a civil conflict. As such, we should expect rebel organizations to relocate when there is a sudden decline in the ability of the group to survive at the location in question. Relocation, therefore, is predicated on finding a new locality that eases resource acquisition and provides a renewed sense of physical security.

In testing these propositions, a combination of spatial regression models and methods borrowed from ecology are used. Specifically, in exploring the locations occupied by rebel organizations, ecological niche factor analysis (ENFA) is employed. This method allows for an exploration into the specific local-level features used by rebels, as well as provides important insight into the geographic preferences of rebels. In empirically testing the hypotheses regarding the movement of rebels across geographic space, a series of spatial regression models are used. This will include two sets of models – the first tests the hypotheses regarding

the influence of local shocks on relocation, whereas the second will look at the influence of the difference in the value of the spatial index from time t to time t+1 (which, is a different way to operationalize *local shocks*).

Below, the location and movement of rebel organizations are separated into two sections. Each will briefly reintroduce the theoretical expectations, outline the data and variables that will be used, and discuss the findings from the empirical tests.

4.1 The Location of Rebel Organizations

Survival during civil war is inherently a local problem – the location that a group occupies fundamentally shapes the ability of that group to survive. The easier it is to access important resources that are necessary to continue fighting, the more likely that the civil conflict in question will continue. In much the same vein, the more security-enhancing features that are in close proximity (e.g. mountainous terrain, forests, etc.), the more secure the location will be perceived to be. This perception of security is vital, as it affords rebels the freedom to act in accordance with their end goals instead of emphasizing short-term survival. From this, the first two empirical predictions were derived:

Hypothesis 1 *Rebel organizations will prefer to occupy locations that provide them with a sense of physical security. This includes:* **(1a)** *forested areas,* **(1b)** *mountainous areas,* **(1c)** *localities near international borders,* **(1d)** *away from areas with high levels of state capacity, and* **(1e)** *away from locations in close proximity to government repression.*

Hypothesis 2 *Rebel organizations will prefer to occupy locations that provide them with access to resources. This includes:* **(2a)** *diamond mines,* **(2b)** *croplands, and* **(2c)** *near acts of political expression.*

As described in Chapter 2, much of this behavior is conditioned by group strength. Groups that are strong relative to the national government are better able to defend them-

selves and are thus not fearful of extinction. Because their risk is lower relative to weaker groups, they enjoy much more autonomy regarding where they are able to base operations from. This implies that they will be more apt to venture into areas that might not be conducive to rebel behavior, per the logic described in the theory chapter. This leads to the following empirical prediction:

Hypothesis 3 *The stronger the rebel organization relative to the national government, the more likely that they will operate away from areas that are conducive to rebel behavior.*

4.1.1 Data and Methods

In order to test the empirical predictions outlined above, the geographic profiles described in the previous chapter are used. Each profile is a spatial polygon, which allows for local-level information to be extracted. This makes it possible to derive measures for each of the push and pull factors described in the theoretical logic. In sum, there are 3851 rebel group months that will be used when employing ecological niche factor analysis (ENFA).[1]

Variables

The dependent variable used for ENFA is the physical location of rebels as defined by the home-range estimation profiles. In particular, local-level information is extracted from each profile. In doing so, the mean value is taken in order to account for the spatial extent occupied by the group in question. This is accomplished by converting each data source into a raster file, which divides the study area into a series of grid cells and assigns each a value.

Per the data sources outlined in the previous chapter, the analysis will include measures of forest density, elevation as a proxy for mountainous terrain, the presence of international borders, nighttime lights as a proxy for state capacity, and government repression. In addition to these security-based features, measures that capture the intensity of diamond mines,

[1]This number is reduced to 1851 in the subsequent regression analysis. The reason is missing values in several of the controls.

croplands, and acts of political expression are also included.[2]

Estimation Techniques

In testing the hypotheses that pertain to the geographic locations occupied by rebel organizations, ecological niche factor analysis (ENFA) is used. Simply stated, ENFA accounts for the fact that ecological variables are not independent (e.g. mountainous areas also tend to be those that are forested) by identifying combinations of the spatial covariates to produce uncorrelated indices or components. In other words, it recognizes and accounts for those locations that would likely bias the results because of significant correlations among the factors under consideration. This allows one to identify the geographic space most preferred by the actor in question with confidence.[3]

Central to ENFA are the concepts of marginality and specialization. Marginality refers to the extent that the ecological niche occupied by the group differs from the available conditions in the study area. A positive value indicates that the actor under consideration prefers higher-than-mean values on the ecological variable (with closer to 1 being a stronger preference), whereas negative values indicate the inverse – that the actor prefers lower-than-mean values (a value of 0 means that a groups preference is equal to the mean available in the study area). A positive value on forest density, for example, would indicate that rebels choose forests as part of their ecological niche. The second concept, specialization, indicates how restricted an actors' niche is in relation to the study area. The higher the value, the more restricted the range of the actor on the corresponding ecological variable. Or, stated differently, the more that the group under consideration relies on this particular ecological variable over time.

[2]Please see the previous chapter for a detailed discussion of each variable.

[3]In the literature, this geographic area is termed an ecological niche – that area that the group under consideration is likely to occupy because it is characterized by factors that are conducive to survival.

Table 4.1: Ecological Niche Factor Analysis of African Rebel Organizations, 1990-2010

	Marginality	Specialization
STRONG GROUPS		
International Borders	0.518860461	0.0051352063
Elevation	0.018633942	0.0052956182
Forest Density	0.232767295	-0.0296638085
State Capacity	0.006137199	-0.9964339294
Croplands	0.120859155	-0.0475324283
Diamond Mines	0.732204969	0.0004369695
Political Expression	0.354223838	0.0447129153
Government Repression	0.003569378	-0.0438896506
WEAK GROUPS		
International Borders	0.3633115	-0.21144240
Elevation	0.3430765	-0.05380430
Forest Density	0.2221710	0.58389922
State Capacity	0.2879760	-0.30977199
Croplands	0.1371179	0.20186779
Diamond Mines	0.2849831	-0.07280578
Political Expression	0.7020208	-0.08548043
Government Repression	0.1586291	0.67981029

4.1.2 Findings

The findings from the ENFA analysis can be seen in Table 4.1. Per the theoretical logic, there is expected to be a difference between strong and weak organizations. As such, the data were subsetted and ENFA was conducted for each type of rebel group.

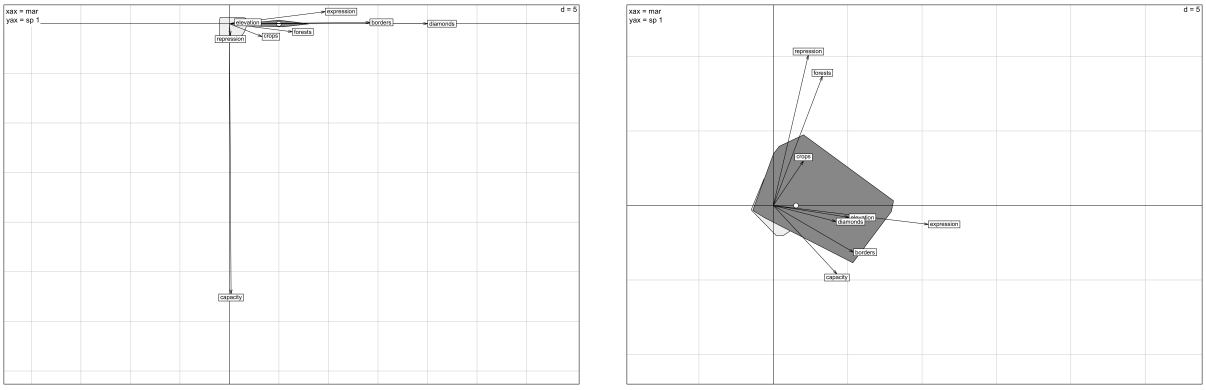
The first value of interest is the Marginality score, which provides a sense of whether or not the value of a given spatial covariate is above or below the mean in the study area. Because the potential range of this value is -1 to 1, we can confirm that both strong and weak rebel groups have a preference for all of the factors under consideration, but some preferences are much stronger relative to others (note that positive values indicate higher than the mean, whereas negative indicate lower). There is notable variation, however, in the strength of preferences observed between strong and weak organizations.

First, with regard to stronger rebel groups, there appears to be a strong preference for

diamond mines and international borders. In addition, there is a more moderate preferences for those locations where political expression is ongoing and densely forested areas. Their weaker counterparts, on the other hand, have a strong preference for areas where political expression is ongoing. More moderate preferences are revealed for international borders, mountainous regions, areas of state capacity, diamond mines, and forested areas. This implies that these are the factors that rebels seek out when choosing a suitable location to operate from.

The Specialization score for each type of rebel organization provides further insight, as it identifies how restricted an actor's niche is in relation to the study area. Positive values indicate some degree of specialization, with those values that are closer to 1 indicating that the groups in question occupy those locations consistently over time (thus, they are seen to 'specialize' in relying on these factors). The first observation from these scores is that stronger organizations tend not to significantly specialize in any of the factors under consideration. The highest specialization score is 0.045, which suggests that they occupy areas where political expression is ongoing most often. Weaker rebel organizations, on the other hand, are highly specialized in three different local-level factors (in order): government repression, forested areas, and croplands. Also notable, both types of rebel groups are extremely unspecialized in areas where state capacity is highest. This is especially true with regard to stronger organizations, who likely have the means to thrive away from these locations.

The fact that the evidence presented here shows that weaker organizations are highly specialized in government repression (Specialization score = 0.680) seems to indicate that governments are more apt to target weaker organizations. This interpretation is supported by the negative Specialization score produced by the ENFA models for stronger organizations. The specialization in forests and croplands are also notable with regard to weaker groups, as it implies that these two particular local-factors are those that the group targets when selecting a suitable habitat. Perhaps most important given the aims of this study, especially



(a) Strong Groups (b) Weak Groups

Figure 4.1: Visualization of Ecological Niche Factor Analysis for African Rebel Organizations, 1990-2010

as it relates to Hypothesis 3, is the strong evidence that strong rebel organizations need not specialize in any particular local-level factor. Instead, it appears as if they enjoy the autonomy to move around the study area as they deem necessary. This is likely because stronger organizations have a much larger portfolio of resources, and are also likely less threatened because they are able to challenge the government militarily.

Figure 4.1 provides a visualization of the ENFA analysis. The x-axis is the Marginality score, whereas the y-axis is the Specialization score. In addition, the light gray polygon in each plot represents the geographic space that is suitable for rebels. Or, in other words, the amount of geographic space that rebels have to choose from. The dark polygon is the geographic space actually utilized by rebels. Overlap, therefore, indicates that the organizations are choosing those geographic spaces that are likely to improve their prospects for survival. The lack of overlap, on the other hand, indicates that the organizations are venturing away from the geographic locations that are most conducive to survival. In addition, because the axes represent both Marginality and Specialization, the further from the intersection the factor is the more important that factor is to rebels.

Using these visualizations as a guide, the ENFA analysis reveals that the most important factor for strong rebel organizations is state capacity, as they are very effective at avoiding those locations. In addition to this finding, it appears that these groups are likely to operate

near diamonds, international borders, and locations where political expression is ongoing. They have a moderate preference for forests and croplands. Finally, as evident by the position of the polygons, stronger organizations are apt to operate away from areas that are most apt to ensure their survival. As previously discussed, this implies that these groups have a larger portfolio of resources and are much less fearful of being confronted by government forces.

Weaker rebel organizations, on the other hand, are especially attracted to locations where government repression is ongoing, forests, and croplands. The finding regarding government repression does not likely represent a strategic choice, as it likely implies that governments are more apt to target weaker groups. Forests and croplands, on the other hand, are likely attractive to these groups because they provide resources and physical security. In addition to these two features, weaker groups also have a moderate preference for areas where political expression is ongoing, diamonds, international borders, and mountainous regions. Like stronger groups, they prefer to avoid areas of high state capacity. Also notable, weaker organizations are much more likely to occupy the geographic space that improves their prospect for survival (per the polygons). The fact that the dark polygon is larger relative to the light gray polygon, implies that there is not enough habitat available to satisfy the demand. This finding has the potential to produce important insight regarding rebel-on-rebel violence.[4]

4.2 Local Shocks and Rebel Relocation

Sudden shifts in the characteristics of a locality occupied by rebels is referred to as a local shock. Local shocks, as discussed at length in Chapter 2, can take one of two forms. First, *negative* local shocks are instances in which the geographic space in question becomes less conducive to survival from the perspective of rebels. These shifts can be sudden and dramatic, such as the onset of government repression or a decision by a third-party state to

[4]The assumption being that rebel groups will compete for this finite geographic space.

deny access to their territory. Or, they might evolve slowly over a significant period of time, such as prolonged drought or a decline in the value of a natural resource that rebels were relying upon. In either case, the worsening environment creates an incentive for the group to relocate in order to find more conducive geographic space. This incentive is much more powerful in the case of weaker groups, as *negative* local shocks represent a serious threat to group survival. From this, the following is derived:

Hypothesis 4 *Rebel organizations will be more likely to relocate during periods of negative shocks.*

Contrary to *negative* local shocks, *positive* local shocks are when the locality occupied by rebels become more conducive to survival. These are instances in which government repression decreases, a new market is opened for a natural resources found within rebel-held territory, a third-party state begins to allow access to rebels, or some other fundamental shift in local-level characteristics. During these moments there is an incentive born to remain at the location in question. Doing so will allow the organizations to enjoy the benefits of the local shock, which will further enhance their ability to survive in the context of civil conflict. As such, the following empirical expectation is proposed:

Hypothesis 5 *Rebel organizations will be less likely to relocate during periods of positive shocks.*

Militarized interstate conflict is common during periods of civil conflict, as the dynamics of internal wars tend to produce issues of contention between states. As states confront one another over these issues, rebels are likely to respond if they are forced to do so. As described in Chapter 2, this is likely to be the case if the episode of interstate conflict occurs in close proximity to rebels. The reason for this is twofold. First, interstate conflict will lead to an influx of military-based resources from the government and the third-party state. Thus, this has the potential to function as a significant *negative shock*. Second, regimes are apt to

ramp up repressive actions during these periods. Because of this, this theory presented in this project expects rebels to avoid these locations. From this, the following hypothesis is proposed:

Hypothesis 8 *Interstate conflict that occurs in close proximity to the territory occupied by rebels will be associated with rebel relocation.*

In addition to interstate conflict, this project also proposes an important relationship between peacekeeping deployments and patterns of rebel movement across geographic space. In particular, the expectation is that rebel groups who are weaker relative to the national government will remain stationary in the shadow of peacekeeping forces. The reason is that the group can exploit the security-enhancing benefits indirectly afforded to them by their presence, which will increase the likelihood of survival. From this, the following is derived:

Hypothesis 10 *Peacekeeping deployments near weak rebel organizations will be associated with less movement across geographic space.*

It is notable that local shocks are predicted to influence the behavior of rebels, regardless of group strength relative to the government. The reason for this expectation is the assumption that all rebel organizations will do whatever is necessary to make themselves better off, as failure to to so undermines their ability to engage in the behavior that best suits their interests. The difference that exists in relation to group strength, therefore, rests in how each type of group is able to cope with movement across geographic space – a topic that will be empirically explored in the subsequent chapter.

4.2.1 Data and Methods

The unit of analysis is rebel group months, per the geographic profiles described in the previous chapter. Unlike the ENFA analysis, not every observation is used in the regression equation because of missing values in some of the control variables. As such, there are a total of 1851 rebel group months included in the analysis.

Variables

The dependent variable in the regression equations is the extent of rebel movement across geographic space. Specifically, the distance in kilometers is measured between the two points. This is done on a month-to-month basis for each rebel organizations included in the analysis. The natural log of the variable is used in the analysis in order to correct for skew. Thus, the coefficients will be interpreted as indicating a percentage change in the dependent variable in relation to change in the independent variables included in the equation.

There are five independent variables of interest that will be used to explain variation in rebel movement across geographic space: the extent of *negative shocks*, the extent of *positive shocks*, the difference in the spatial index from the previous month, the intensity of interstate conflict in rebel territory, and the intensity of peacekeeping forces in rebel territory. In addition, a set of interaction terms are constructed in order to examine how external factors (interstate conflict and peacekeepers) interact with changing local conditions to either promote or deter relocation.

A set of control variables are also included in the regression equations in order to account for group-level characteristics that might influence movement across geographic space. Of those described in detail in the previous chapter, those that capture group strength, the type of organization, whether or not the group has external support, and territorial control are included. In addition, dummy variables for each month are included in order to account for changes in the ease of movement during certain seasons.

Estimation Technique

In order to estimate the influence of shifts in local-level characteristics on rebel movement, spatial regression models are employed. The spatial weights matrix is based on the neighbor list described in Chapter 3, which means that groups within 200 miles of one another, those who are formally allied, and splinter groups are linked. In each model, spatial autocorrelation was verified via a Moran's I test. In addition, Lagrange multiplier diagnostic tests identified

the type of spatial dependence present and was used to select the correct model specification.[5]

4.2.2 Findings

The findings from the spatial regression models can be found in Table 4.2. The estimates strongly support Hypothesis 4, which expects periods of *negative shock* to be associated with an increase in rebel movement across geographic space. This, as described while introducing the theoretical logic, is the case because a strong incentive is born during these moments to relocate in order to increase the probability of survival during wartime. The importance of negative shocks in also notable, as an increase of 3.1% is anticipated for every one unit increase in the extent of the shock (see Model 3). This finding is supported by the model estimated with the difference in the spatial index from time t to time $t+1$ as the independent variable of interest. The coefficient is positive, indicating that movement increases as the value of the spatial index increases. Because higher values are associated with deteriorating local conditions, this is further evidence of this incentive to relocate. The model indicates an increase in movement of 1.5% for every one unit increase in the spatial index (see Model 4).

The substantive effect of changing local conditions on rebel movement can be found in Figure 4.2. The figures show the simulated change in the range of movement exhibited by rebel organizations when moving from the minimum to maximum observed values (along with the corresponding confidence intervals).[6] As can be seen in the figure, moving from the minimum to the maximum extent of a *negative shock* is predicted to produce an increase in movement of roughly 40 kilometers during the month in question. This equates to a 37% increase. The simulation from the model that relies on the difference in the spatial index also reveals a simliar pattern – moving from the most extreme *positive shock* to the most extreme *negative shock* is predicted to increase rebel movement by roughly 35 kilometers. In

[5]The results from these tests can be found in the appendix.

[6]Note that are dummy variables are held at 0, whereas continuous variables are held at their mean values.

Table 4.2: Influence of Local Shocks on the Movement of Rebel Organizations During Wartime, 1990 – 2010

	Dependent variable:			
	ln Movement (kilometers)			
	(1)	(2)	(3)	(4)
Negative Shock	0.030**		0.031**	
	(0.013)		(0.014)	
Positive Shock		−0.012	0.001	
		(0.013)	(0.014)	
Spatial Index Change				0.015*
				(0.008)
Strong Group	−0.828***	−0.831***	−0.828***	−0.829***
	(0.187)	(0.187)	(0.187)	(0.187)
Weak Group	−0.399***	−0.409***	−0.399***	−0.406***
	(0.134)	(0.134)	(0.134)	(0.134)
Secessionist Group	0.174	0.185	0.175	0.178
	(0.215)	(0.215)	(0.215)	(0.215)
Ethnic Group	−0.043	−0.024	−0.043	−0.034
	(0.173)	(0.173)	(0.173)	(0.173)
Terrorist Group	0.658***	0.656***	0.659***	0.657***
	(0.160)	(0.160)	(0.160)	(0.160)
External Sponsorship	0.438***	0.434***	0.439***	0.435***
	(0.089)	(0.089)	(0.089)	(0.089)
Territorial Control	−0.102	−0.104	−0.102	−0.104
	(0.118)	(0.118)	(0.118)	(0.118)
Forest Density	−0.003	−0.003	−0.003	−0.003
	(0.004)	(0.004)	(0.004)	(0.004)
Elevation	−0.0001	−0.0001	−0.0001	−0.0001
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
International Borders	−0.029*	−0.028*	−0.029*	−0.028*
	(0.015)	(0.015)	(0.015)	(0.015)
State Capacity	−0.062	−0.062	−0.062	−0.061
	(0.085)	(0.085)	(0.085)	(0.085)
Diamond Mines	−0.048	−0.047	−0.048	−0.049
	(0.045)	(0.045)	(0.045)	(0.045)
Political Expression	0.022	0.019	0.022	0.023
	(0.034)	(0.034)	(0.034)	(0.034)
Government Repression	−0.443	−0.415	−0.442	−0.447
	(0.332)	(0.333)	(0.333)	(0.333)
Constant	5.125***	5.178***	5.122***	5.163***
	(0.332)	(0.332)	(0.333)	(0.332)
Observations	1,511	1,511	1,511	1,511
Log Likelihood	−2,110.836	−2,113.159	−2,110.832	−2,111.716
σ^2	0.932	0.935	0.932	0.933
Akaike Inf. Crit.	4,257.671	4,262.318	4,259.664	4,259.433
Wald Test (df = 1)	520.341***	519.428***	519.905***	523.977***
LR Test (df = 1)	131.674***	130.706***	131.664***	131.405***

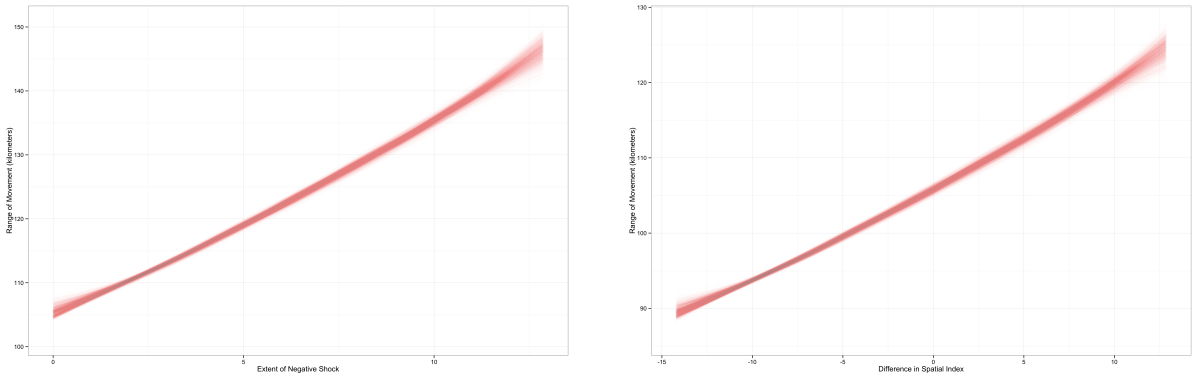
Note: spatial error models *p<0.1; **p<0.05; ***p<0.01

this case, this represents an increase in movement across geographic space of approximately 38%. It notable that movement might often encompass multiple months, which implies that these increases in movement may extend far beyond the time period included in the empirical models.

Regarding the relationship between *positive shocks* and rebel movement across geographic space, no evidence is produced by the statistical models that this is an important one. Each of the coefficients fails to reach statistical significance, which means that *positive shocks* do not alter the way in which rebels behave spatially. This is not inconsistent with the theoretical framework, as this simply implies that these organizations continue operating according to the status quo. Thus, taken together, the evidence shows that while *negative shocks* create a strong incentive to relocate in order to increase the probability of survival, *positive shocks* do not necessarily lead a rebel organization to remain stationary.

Because the dependent variable and many of the control variables have yet to be considered in the conflict literature, a brief discussion of these findings is also warranted. First, regarding the relationship between the variables taken from the Non-State Actor Data, there are four variables that reach statistical significance in each of the statistical models. First, both strong and weak groups are negatively associated with movement. Though, the effect is much greater for stronger organizations as their movement across geographic space is found to be reduced by 82.5% (as compared to 39.9% for weak groups). In addition to the importance of group strength found in the models, terrorist groups and those with external support are found to move more during periods of civil conflict. Terrorist organizations move 65.9% more, holding all else constant. Similarly, those groups who enjoy external sponsorship move 43.9% more when all the other factors are held constant. No patterns are uncovered for secessionist groups, ethnically-based groups, or those who control territory.

Those controls that account for local-level conditions all fail to reach statistical significance, with the exception of international borders. The coefficient for this factor is negative, which indicates that rebels operating near borders regions are less apt to move across geo-



(a) Negative Shocks (b) Spatial Index Change

Figure 4.2: The Effect of Changing Local Conditions on Rebel Movement in Africa, 1990 – 2010

graphic space. The effect, however, is relatively minimal – producing a decrease in movement of 2.9% in the empirical model.

Hypothesis 8 predicts that interstate conflict that occurs in close proximity to rebels will be associated with relocation. The reason is that this form of event may lead to an influx of resources, both government and those from an external state. The estimates from the models used to test this expectation can be found in Table 4.3. The model estimated on the full sample finds no support for this hypothesis, as the variable is negative and fails to reach statistical significance. When subsetting the data based on group strength, however, some noteworthy findings appear. Weak organizations seem to be hesitant to relocate during these periods (for every one percent increase in interstate conflict, movement decreases by 1.1%), whereas stronger organizations are associated with increased levels of movement (for every one percent increase in interstate conflict, movement increases by 2.1%). This seems to show that weak organizations are uneasy relocating during such an uncertain period, or are moving cautiously as external resources come to the location. Strong groups, on the other hand, seem concerned with getting away from interstate conflict as it is ongoing.

Looking further at the models that use the subsetting data (see Model 8 and Model 9), some more nuanced findings emerge. When interacting interstate conflict with the various forms of *local shocks*, it appears that *negative shocks* are important in understanding why

Table 4.3: Militarized Interstate Conflict, International Peacekeeping, and the Movement of African Rebel Organizations Across Geographic Space, 1990 – 2010

	Dependent variable:					
	ln Movement					
	full sample	*weak groups*	*strong groups*	*full sample*	*weak groups*	*strong groups*
	(5)	(6)	(7)	(8)	(9)	(10)
ln Intensity of Interstate Conflict	−0.007	−0.011**	0.021*	*NA*	*NA*	*NA*
	(0.005)	(0.005)	(0.012)			
ln Intensity of Peacekeeping Forces	*NA*	*NA*	*NA*	−0.001	0.001	−0.005
				(0.004)	(0.004)	(0.009)
Spatial Index	0.028	0.027	−0.037	0.016	0.013	0.013
	(0.026)	(0.033)	(0.060)	(0.019)	(0.021)	(0.038)
Positive Shock	−0.014	0.019	−0.135*	−0.053*	−0.057*	−0.022
	(0.040)	(0.048)	(0.074)	(0.028)	(0.033)	(0.051)
Negative Shock	0.041	0.065	−0.060	−0.023	−0.023	0.013
	(0.044)	(0.051)	(0.091)	(0.029)	(0.033)	(0.059)
ln Interstate Conflict x Positive Shock	−0.00005	0.001	−0.006	*NA*	*NA*	*NA*
	(0.002)	(0.002)	(0.004)			
ln Interstate Conflict x Negative Shock	0.003*	0.004**	−0.011**	*NA*	*NA*	*NA*
	(0.002)	(0.002)	(0.004)			
ln Peacekeeping Forces x Positive Shock				−0.004***	−0.004**	−0.002
				(0.001)	(0.002)	(0.003)
ln Peacekeeping Forces x Negative Shock	*NA*	*NA*	*NA*	−0.003**	−0.003*	−0.002
				(0.001)	(0.002)	(0.003)
Strong Group	−0.823***	*NA*	*NA*	−1.109***	*NA*	*NA*
	(0.284)			(0.246)		
Weak Group	0.222	*NA*	*NA*	−0.394**	*NA*	*NA*
	(0.230)			(0.174)		
Secessionist Group	−1.301***	−1.976***	*none*	0.697*	0.470	*none*
	(0.250)	(0.343)		(0.357)	(0.383)	
Ethnic Group	−0.186	−0.232	0.029	−0.377*	−0.079	−1.565**
	(0.198)	(0.491)	(0.590)	(0.222)	(0.339)	(0.667)
Terrorist Group	0.872*	1.325**	*none*	1.025***	1.113***	*none*
	(0.501)	(0.570)		(0.378)	(0.392)	
External Sponsorship	0.592***	1.158***	−0.775*	0.673***	0.784***	−0.566
	(0.131)	(0.189)	(0.467)	(0.106)	(0.121)	(0.504)
Territorial Control	0.787***	2.410***	0.052	−0.195	0.063	−0.370
	(0.168)	(0.329)	(0.566)	(0.160)	(0.197)	(0.585)
Constant	0.229	1.247	2.768*	4.087***	3.784***	5.087***
	(0.626)	(0.786)	(1.548)	(0.465)	(0.497)	(1.011)
Observations	952	774	178	818	682	136
Log Likelihood	−1,925.440	−1,563.521	−353.109	−1,166.160	−988.011	−179.295
σ^2	3.296	3.240	2.978	0.974	1.016	0.753
Akaike Inf. Crit.	3,882.879	3,155.042	730.218	2,364.320	2,004.021	382.591
Wald Test (df = 1)	101.354***	154.212***	61.755***	393.109***	401.646***	188.734***
LR Test (df = 1)	93.417***	70.629***	43.611***	153.005***	140.301***	45.145***

Note: spatial regression models *p<0.1; **p<0.05; ***p<0.01

rebels relocate in the context of interstate conflict. First, regarding weak organizations, the interaction terms is positive and statistically significant – indicating that weak organizations are more apt to relocate when interstate conflict occurs in the context of a negative shock. Contrary to weak groups, those groups that are strong relative to the government are less likely to relocate in the context of a negative shock. It is also notable that these groups are also less likely to move across geographic space during periods of *positive shocks*. Thus, not only is interstate conflict associated with rebel movement, but it is also conditioned by changes occurring locally.

The second hypothesis tested in this section, Hypothesis 10, predicts that weak organizations will remain stationary when peacekeeping deployments occur nearby because they want to enjoy the protection that these forces afford. According to the estimates produced by the statistical models (see Models 4-6), this is indeed the case. When estimating the model using the full sample there is no relationship between the intensity of peacekeeping forces and movement across geographic space. When looking at the interaction terms, however, the coefficient becomes negative and statistically significant for both forms of *local shocks*. As is evident by the models that use subsetted data (Model 5 and Model 6), this findings only holds for weak organizations. There is evidence, therefore, that weak organizations prefer to remain stationary when peacekeepers are deployed to their locations – likely because peacekeepers provide a sense of security. Movement of strong groups, on the other hand, is not influenced by peacekeeping forces.

4.3 Conclusion

In summary, the empirical analyses presented in this chapter have uncovered some important patterns pertaining to the location and movement of armed non-state groups engaged in civil conflict. First, there is strong evidence that rebels do indeed choose to strategically occupy certain geographic locations. This is especially the case for weaker groups, as they are seen

to specialize much more relative to their stronger counterparts. In particular, these weaker groups have an affinity for forested areas and croplands. Stronger organizations, on the other hand, have a preference for diamonds mine, international borders, political expression, and forests. Though, as noted, they do not specialize in any one factor.

Relocation during periods of civil conflict is associated with *local shocks*, but only those that are *negative* in the sense that local conditions are deteriorating. There is no empirical relationship uncovered between *positive shocks* and the predicted incentive for rebels to remain stationary. Rather, this form of shock shares no relationship with the movement of rebels across geographic space. The implication, then, is that armed non-state actors are especially attune to shifts in their strategic environment that increases threat. This is consistent with the findings regarding the presence of interstate conflict, as weaker organizations are shown to be more apt to flee when it occurs in the context of a *negative shock*. This is contrary to instances in which peacekeeping forces are deployed in close proximity to weaker organizations, as they decrease their range of movement across geographic space. This provides support for the notion that they prefer to remain stationary in order to exploit the security-enhancing benefits provided by these forces.

The policy-making implications that stem from these findings are twofold. First, the fact that rebels strategically select into areas that provide certain benefits imply that the amount of space that is conducive to rebels matters. This means that ending civil wars may be possible when the national government, or some other external actor, is able to prevent access to areas that are conducive to rebel behavior. Though this might be difficult in the context of wars ongoing in relatively large countries governed by weak regimes, such as in the Democratic Republic of the Congo, it might have been possible in other cases – such as defending the diamond mines against the RUF in Sierra Leone. Though, significant manpower would be needed in order to accomplish this task.

Second, the fact that weak rebel organizations exploit peacekeepers in order to enhance their security implies that these forces might be inadvertently prolonging civil conflicts. As

groups begin to feel more secure, and have the autonomy to coordinate and remobilize, the likelihood that a lasting peace is achieving decreases. It might be a better tactic, therefore, to deploy in close proximity to rebels and focus on containment – or, stated differently, prevent rebel forces from occupying those geographic locations that provide them with the most benefit. A potential problem with this strategy, however, is that weaker organizations might relocate closer to peacekeepers if they are deployed in close proximity. This study has not taken up this question, so future empirical work will need to address this possibility.

In terms of scholarly work, these findings highlight the fact that local conditions matter for rebel behavior. As such, variation in how rebels groups behave can be explained by the level of resources that they have at their disposal locally. When the level of resources becomes insufficient for survival, they relocate in order to find a more suitable locality. As will be empirically explored in the next chapter, these periods of relocation can potentially explain fundamentally shifts in the tactics employed by rebels. Or, stated differently, explain why civil war violence clusters temporally during internal wars.

This leads directly into the question posed in the next chapter – how might relocation alter rebel behavior? Specifically, this study has a strong interest in movement that occurs as a result of *negative shocks* because of the expectation that the group in question is coping with threat during these moments. This move the motivation of the group away form long-term objectives and to those that prioritize survival in the short-term. Confirmation that *negative shocks* are indeed associated with rebel movement justify this further exploration in rebel behavior during periods of war.

Chapter 5

Local Shocks and Civilian Victimization During Wartime

In the the previous chapter empirical tests confirmed that rebels strategically select specific locations that provide them with access to resources and security, and relocate when *negative shocks* occur – that is, when the amount of resources and/or level of security available at a location decreases. Evidence was also presented that indicates that weak organizations relocate when interstate conflict occurs in the context of a *negative shock*, whereas stronger groups are more apt to remain stationary. In addition, weaker rebels seem to remain stationary when peacekeeping forces are deployed nearby in order to exploit the security-enhancing benefits that these troops afford. This chapter builds directly off of these findings by empirically exploring the potential consequences of this relocation. In other words, what observable shifts in rebel behavior might be observed during these periods of uncertainty?

The expectation, as outlined in Chapter 2, is that movement across geographic space requires a shift in rebel tactics. This is especially true when the movement is involuntary via a significant *negative shock*. During these moments, armed non-state groups are essentially forced to abandon their previous sources of security and resources in the name of surviving in the short-term. It is expected that weaker rebel organizations will be more apt to behave in this way, as they are at much greater risk of extinction relative to their stronger counterparts.

In what follows, the empirical predictions are further delineated and reintroduced. The research design is then presented, and is followed by a discussion of the findings. The chapter is concluding by briefly linking the findings from the previous chapter to those presented here. Special care is taken during this discussion to foreshadow the necessity of the subsequent chapter, which considers other potential ways in which peacekeeping forces might influence

rebel behavior during wartime.

5.1 Rebel Relocation and Civilian Victimization

Relocation in the context of civil conflict has the potential to produce serious consequences. This is because doing so necessitates leaving local-level factors behind that were being relied upon for physical security and resources. If rebels fail to find a new location to operate from that provide them with these benefits, the survival of the group will likely be at risk. In addition to abandoning local-level features vital for rebellion, movement also decreases the range of options that a group has. Or, stated differently, limits the tactics and strategies that a group may employ. This puts the organization at a serious strategic disadvantage, and often forces them to behave in a manner that is commonly viewed as being sub-optimal – such as targeting civilian populations for resources.

This cost of relocation means that rebels will only engage in this behavior if there is a high probability that doing so will make them better off and will not put the survival of the group at risk, or if they are forced to relocate because of increasing threat. As described in Chapter 2, it is during these periods of forced relocation via the onset of a *negative shock* that begins the shift in the behavioral profile of rebels. During these moments they do not choose to abandon potentially important local-level features, but instead must do so in order to avoid suffering the costs imposed locally. As movement occurs, the group is now relegated to behaving as "roving bandits," in that resource acquisition takes place by raiding and looting villages in close proximity to the escape route. Even though this behavior may be sub-optimal, it occurs because surviving in the short-term is given precedence over longer term goals and aspirations.

This process likely only occurs if the group in question is weaker relative to the national government. Those rebel organizations that are capable of engaging the government militarily are less likely to feel the pressures associated with a*negative shock*. In addition, stronger

organizations are apt to enjoy a much larger portfolio of resources. As such, relocation is less likely during these moments. In addition, if relocation occurs, these forms of groups are less likely to resort to sub-optimal tactics as their survival will not be perceived as being at risk. From this, the following empirical predictions is derived:

Hypothesis 6 *Movement that occurs in the context of negative shocks will be associated with an increase in the use of violence against civilian populations by weak rebel organizations.*

The use of violence targeting civilians takes time and resources – as such, it is a relatively costly action. As such, we should expect extreme movements across geographic space to be associated with relatively fewer attacks targeting civilian populations. This, when paired with the expectation that this tactic will not be employed when relocation is not occurring (or, was not forced) means that empirically we should observe a curvilinear relationship – violence should not occur during low-level of movement, nor should it occur at the extremes. Rather, it is moderate ranges of movement across geographic space that are expected to be associated with civilian victimization. From this, the following is derived:

Hypothesis 7 *There will be an inverse-U relationship between movement across geographic space and the use of violence against civilian populations by rebel organizations.*

Because movement is expected to result from interstate conflict that occurs in close proximity to rebels, it is anticipated that the main causal mechanism outlined in this study will be sparked. In particular, as weak rebel organizations are forced to abandon local-level features that provide them with physical security and access to resources, they are likely to become increasingly desperate. As such, there is a strong incentive born to emphasis short-term survival over any long-term goals or aspirations that the group in question might have. This will increase the likelihood that during these moments weak groups will become to rely on civilian populations for support. As no prior relationship has been established,

this will involve coercion – usually in the form of raiding and looting villages that are near the route being traveled. From this, the following empirical expectation is proposed:

Hypothesis 9 *Movement that occurs because of interstate conflict will be associated with an increase in the use of violence against civilian populations by weak rebel organizations.*

This project also asserts that the deployment of peacekeeping forces also has the potential to alter patterns of civilian victimization at the hands of rebels. As described in Chapter 2, this is because strong organizations will seek to undermine a mission because they would prefer not to be monitored to interfered with during periods of civil conflict. One way to undermine a peacekeeping mission is to kill civilians. Because protecting these populations is one of the core purposes of peacekeeping missions, killing civilians sends the signal that the mission is not effective in its purpose. This is not unlike the finding in the literature that rebels target civilians when fighting democratic regimes because they want to signal to the population that the government is unable to protect them. In this case, however, the purpose is to signal to the international community that intervention is a wasted effort. From this, the following is derived:

Hypothesis 11b *Peacekeeping deployments that occur near strong rebel organizations will be associated with an increase in the use of violence against civilian populations.*

5.1.1 Data and Methods

The sample used for the empirical models below consists of 1851 rebel group months. This is lower than the 3568 available months for two reasons. First, in order for a *local shock* to occur to rebels they need to be active for consecutive months. This is because the home-range analysis method used to create the geographic profiles needs known locations of rebel activity. Thus, the observations in which this was not the case are dropped as the *local shock* variables are coded as missing. Second, the control variables are only available for a subset

of rebel organizations. When this information is not available, therefore, the group is absent from the sample.

In addition, the data are disaggregated by group strength in order to estimate the interaction between rebel relocation and *local shocks* on the intensity of civilian victimization. In doing so, strength is defined relative to the national government – strong groups, therefore, are stronger or equal in military strength to the national government. Weaker groups are, of course, weaker relative to the national government.

Variables

The dependent variable used in this portion of the study is the intensity of violence used against civilian populations by rebel organizations. As described in Chapter 3, this variable was created using kernel density estimation. Because violence targeting civilians is relatively rare when looking at month-to-month patterns, the variable is highly skewed. Thus, the natural log is used in the empirical models.

In terms of independent variables, there are seven that are used to test the hypotheses outlined in developing the theory. The first is the natural log of rebel movement in geographic space, as measured in kilometers. In addition to including this measure, the variable is squared in order to test the expectation of a curvilinear relationship between movement and civilian victimization. If both versions of the variable reach statistical significance, with one coefficient revealing a positive relationship and the other negative, the evidence will be such as to support this hypothesis.

In addition to rebel movement, five others are included: the extent of *negative shocks*, the extent of *positive shocks*, the difference in the spatial index from the previous month, the intensity of interstate conflict, and the intensity of peacekeeping deployments. These variables are also used to construct a series of interaction terms to explore the interaction between local conditions and other potentially important factors.

A set of control variables are also included in the regression equations in order to account

for group-level characteristics that might influence the use of violence targeting civilian populations. Of those described in detail in the previous chapter, those that capture group strength, the type of organization, whether or not the group has external support, and territorial control are included. In addition, the value of the spatial index is included to account for local-level characteristics.

Estimation Technique

In order to estimate the influence of shifts in local-level characteristics on civilian victimization during wartime, spatial regression models are employed. The spatial weights matrix is based on the neighbor list described in Chapter 3, which means that groups within 200 miles of one another, those who are formally allied, and splinter groups are linked. In each model, spatial autocorrelation was verified via a Moran's I test. In addition, Lagrange multiplier diagnostic tests identified the type of spatial dependence present and was used to select the correct model specification.[1]

5.1.2 Findings

Hypothesis 7 predicts that a curvilinear relationship will exist between rebel relocation and the use of violence targeting civilians. The reason for this, which is discussed at length in Chapter 2, has to do with the combination of opportunity and willingness. When movement across geographic space is not taking place (or is occurring in a very limited way), there is no willingness on part of rebels to shift to using violence against civilians. When movement is extreme, on the other hand, the group is dedicating high levels of resources towards this task. As such, there is very little opportunity to target civilian populations with violence. The estimates from the empirical models provide evidence that this is indeed the case (see Model 1, Model 3, and Model 4). Using Model 4, for every one percent increase in the range

[1]The results from these tests can be found in the appendix.

Table 5.1: Rebel Movement, Local Shocks and Civilian Victimization in Africa, 1990-2010

	Dependent variable:			
	ln Intensity of Civilian Victimization			
	(1)	(2)	(3)	(4)
ln Movement	0.529***		0.535***	0.533***
	(0.087)		(0.087)	(0.087)
ln Movement^2	−0.084***		−0.085***	−0.085***
	(0.015)		(0.015)	(0.015)
Spatial Index Change		0.020	0.027	
		(0.020)	(0.020)	
Negative Shock				−0.001
				(0.032)
Positive Shock				−0.051*
				(0.030)
Spatial Index	−0.039**	−0.054**	−0.063**	−0.060**
	(0.019)	(0.026)	(0.026)	(0.026)
Strong Group	−0.815	−0.440	−0.816	−0.906
	(1.648)	(1.658)	(1.647)	(1.649)
Weak Group	1.230**	1.550***	1.316**	1.264**
	(0.522)	(0.507)	(0.526)	(0.527)
Secessionist Group	−3.019**	−3.032**	−3.021**	−3.060***
	(1.184)	(1.195)	(1.184)	(1.184)
Ethnic Group	−2.251**	−1.938**	−2.349**	−2.323**
	(1.029)	(0.985)	(1.030)	(1.029)
Terrorist Group	−1.509***	−1.270***	−1.522***	−1.516***
	(0.383)	(0.368)	(0.383)	(0.383)
External Sponsorship	−1.072***	−0.680*	−0.949**	−0.999**
	(0.411)	(0.404)	(0.421)	(0.423)
Territorial Control	0.974**	1.167***	0.926**	0.942**
	(0.382)	(0.366)	(0.383)	(0.383)
Constant	1.231	1.528	1.728*	1.777*
	(0.879)	(0.950)	(0.951)	(0.951)
Observations	1,851	1,851	1,851	1,851
Log Likelihood	−3,944.143	−3,961.757	−3,943.223	−3,942.604
σ^2	4.136	4.209	4.132	4.129
Akaike Inf. Crit.	8,036.286	8,069.514	8,036.447	8,037.207
Wald Test (df = 1)	15.112***	21.945***	15.254***	15.393***
LR Test (df = 1)	11.499***	16.458***	11.597***	11.649***
Note: spatial error models				*p<0.1; **p<0.05; ***p<0.01

of movement produces an increase in the intensity of violence against civilians of 53.3%.[2] The observed negative relationship produced when this variable is squared indicates that the curve begins to decline as this measure increases. Specifically, for every one percent

[2]The percentage is used during the interpretation beacuse both the dependent and independent variable are logged.

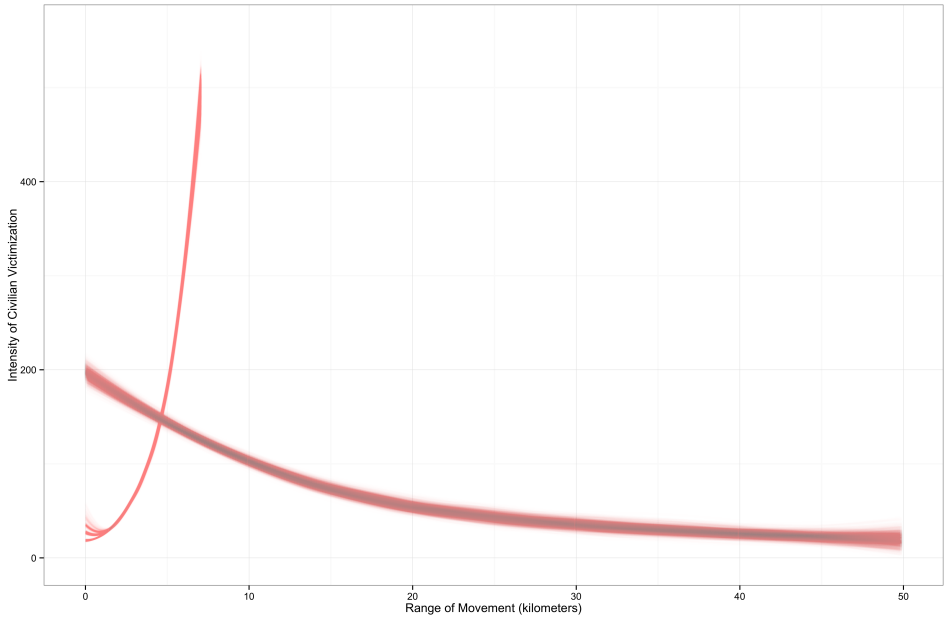


Figure 5.1: Rebel Movement and Civilian Victimization in Africa, 1990 – 2010

increase in movement when the variable is squared decreases rebel attacks against civilians by 8.5%. Thus, the use of violence against civilians increases dramatically when relocation is occurring, but decreases slightly as the range of movement becomes extreme. It it also notable that *positive shocks* are associated with a reduction in the intensity of attacks against civilian targets, producing roughly a 5.1% decrease for every one unit increase in the extent of the positive shock.

In terms of substantive impact, the nonlinear relationship can be seen in Figure 5.1. Each curve (the movement of rebels and squared term) are simulated while holding all other variables constant – dichotomous variables are set at 0, whereas continuous predictors are set at the mean value. The inverse-U relationship, then, is captured by looking at where the two curves overlap. According to the model, therefore, the intensity of violence targeting civilians is at its highest at around 6 kilometers. Following this point, the curve begins a gradual descent with no significant difference in the intensity of violence being observed after the 30 kilometer mark (roughly). The fact that this relationship holds for strong *and* weak rebel organizations means that this finding might be capturing the strategy that rebels employ

in attacking civilian targets – rebels may be moving beyond their base of operations, killing civilians, and then returning. This would be consistent with the behavior of the LRA, for example, as they prefer to employ the same 'hit-and-run' tactics that this empirical pattern seems to be picking up.

Looking at the control variables included in each equation, some interesting patterns emerge. First, only weaker groups are associated with violence against civilian populations – a finding that is consistent with the literature in this area. The effect is also significant, leading to an increase of 126.4% when all other factors are held constant. In terms of the type of group, all four included in the equation are negatively associated with the use of violence against civilian populations (secessionist, ethnic, and terrorist). The most substantively important of the three are secessionist groups, with are associated with a decrease of 306%. Finally, those rebel organizations who enjoy external sponsorship are less likely to kill civilians in these models, yet those who control territory are more likely to engage in this behavior. This is consistent with the argument found in the literature that controlling territory often involves using violence to coerce civilians into providing support. In the model, those groups that control territory are associated with an increase of 94.2% in the intensity of civilian victimization.

The next hypothesis, Hypothesis 6, predicts that movement that occurs because of a *negative shock* will be associated with the use of violence against civilian populations by weak organizations. This is because these forms of *local shocks* incentivize relocation in the name of survival, which forces rebels away from resources and the features that were providing physical security. As such, they begin to resort to tactics that are not always in their best interest – such as raiding and looting villages, or coercing civilians into providing support. *Positive shocks*, on the other hand, do not force the hand of these organizations in the same way.

The estimates from the models used to test this notion are found in Table 5.2. Model 5 uses a subset of the data that only include organizations that are weak relative to the

Table 5.2: Rebel Movement, Negative Shocks, and Civilian Victimization in Africa (weak versus strong groups), 1990-2010

	Dependent variable:	
	ln Intensity of Civilian Victimization	
	weak groups	*strong groups*
	(5)	(6)
ln Movement	0.477***	0.537**
	(0.095)	(0.269)
ln Movement^2	−0.083***	−0.083*
	(0.015)	(0.044)
Negative Shocks	−0.075	−0.143
	(0.060)	(0.132)
Positive Shocks	−0.033	−0.075
	(0.061)	(0.152)
ln Movement x Negative Shocks	0.026**	0.016
	(0.014)	(0.033)
ln Movement x Positive Shocks	−0.001	−0.015
	(0.014)	(0.037)
Spatial Index	−0.074***	0.002
	(0.029)	(0.068)
Secessionist Group	−3.084***	*none*
	(1.148)	
Ethnic Group	−2.503***	−1.790*
	(0.900)	(0.967)
Terrorist Group	−1.563***	*none*
	(0.365)	
External Sponsorship	−0.940**	3.127***
	(0.403)	(0.908)
Territorial Control	0.865**	2.070**
	(0.365)	(0.948)
Constant	3.544***	−0.317
	(0.778)	(2.150)
Observations	1,570	281
Log Likelihood	−3,289.243	−634.545
σ^2	3.836	5.259
Akaike Inf. Crit.	6,710.487	1,311.090
Wald Test (df = 1)	30.165***	9.175***
LR Test (df = 1)	16.759***	8.184***
Note: spatial error models	*p<0.1; **p<0.05; ***p<0.01	

national government, whereas Model 6 provides the estimates from groups that are stronger relative to the national government. First, in the case of weak organizations, it is first notable that the curvilinear relationship between relocation and civilian victimization is still present in this sample. There is no relationship, however, between the two forms of *local shocks* and

civilian victimization. When interaction terms are used between the extent of movement and extent of these *local shocks* patterns do emerge. In particular, movement that occurs in the context of *negative shocks* is associated with an increase in civilian victimization, supporting Hypothesis 6. This finding implies that even though the nonlinear relationship between movement and civilian victimization might be picking up the 'hit-and-run' tactics rebels employ, there is something else going on with regard to weaker groups. In this sense, the only form of movement that actually increases violence against civilians is that which occurs in the context of a negative shock imposed on a weak organization.

When teasing out the substantive importance of this interaction between rebel relocation as a consequence of *negative shocks* and civilian victimization at the hands of weak organizations, the effect appears to be significant. As is evident by the relationship presented in Figure 5.2, a move from the minimum value of this interaction term to the maximum is associated with an increase in the intensity of civilian victimization of roughly 90 – which, in terms of the estimates produced by the simulation, represents nearly a 20% increase in the intensity of these attacks (the maximum value of the intensity measure is roughly 460 in the simulations).

Stronger groups are simliar to weaker organizations, as the curvilinear relationship between movement and civilian victimization is present as well (see Model 6). There is no relationship, however, between the interaction terms and the intensity of these attacks. This seems to imply that unlike weak groups, stronger organizations do not enter that period of desperation in which shifting to this tactic makes strategic sense. There is a notable shift in the direction of an empirical relationship vis-a-vis weaker groups – there is a strong positive relationship between external sponsorship and the use of violence against civilian populations (being associated with a 312.7% increase in intensity). This is contrary to weaker organizations, who are less apt to engage in this behavior in the content of external sponsorship. This finding pertaining to stronger groups is consistent with the literature in this area, but the negative relationship observed among weak organizations is notable – it might be

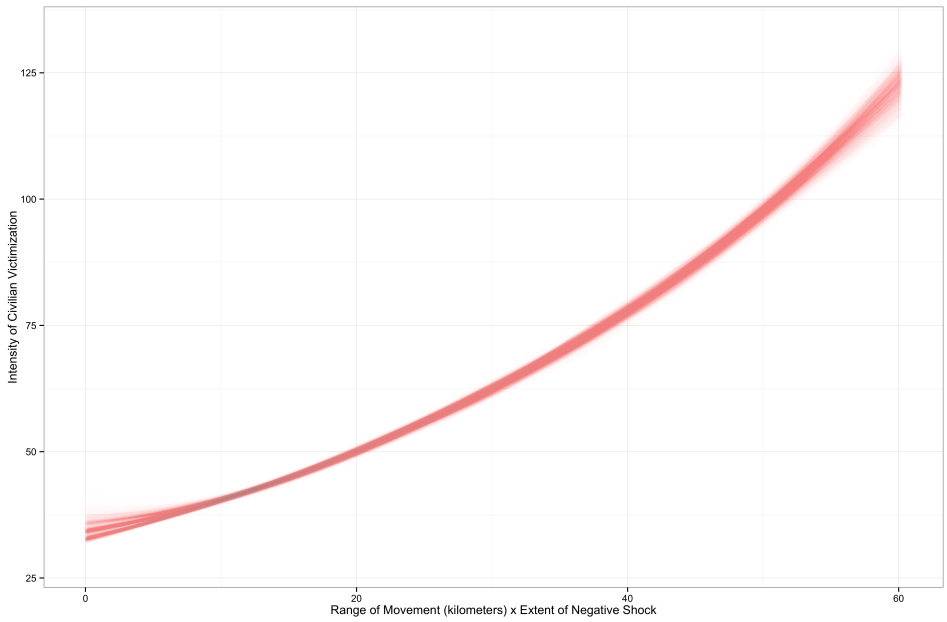


Figure 5.2: Rebel Movement During Negative Shocks and Civilian Victimization by Weak Organizations in Africa, 1990 – 2010

the case that they are much more concerned about losing third-party support and are thus guarding against reputational costs that might be imposed on the third-party. Evidence that this might be the case is found in a recent study by Reeder (2015), who finds that during periods in which an external actor is being pressured to end support for rebels, the rebels in question become less likely to kill civilians but more likely to violently engage government forces. The notion being that the rebels want to signal their resolve to the third-party, as well as prevent any unnecessary reputational costs.

Hypothesis 9 predicts that weak organizations will increase their use of violence against civilian populations, especially in cases in which movement occurs as a result of negative shocks. The estimates produced by the models, including those estimated with the subsetted data, can be found in Table 5.3. The first thing to note is that in the model that was estimated using the full sample, none of the independent variables of interest reach statistical significance (see Model 7). The models that use samples based on group strength, however, tells a different story. First, regarding weak organizations, Hypothesis 9 receives some sup-

Table 5.3: Militarized Interstate Conflict, International Peacekeeping, and Civilian Victimization by African Rebel Organizations, 1990-2010

	Dependent variable:					
	ln Intensity of Civilian Victimization					
	full sample	*weak groups*	*strong groups*	*full sample*	*weak groups*	*strong groups*
	(7)	(8)	(9)	(10)	(11)	(12)
ln Intensity of Interstate Conflict	−0.002	−0.010	0.036*	*NA*	*NA*	*NA*
	(0.007)	(0.007)	(0.019)			
ln Intensity of Peacekeeping Forces	*NA*	*NA*	*NA*	0.007	−0.003	0.057***
				(0.008)	(0.009)	(0.019)
ln Movement	0.001	−0.011	0.440***	0.007	−0.007	0.589***
	(0.046)	(0.047)	(0.122)	(0.042)	(0.044)	(0.100)
Negative Shock	−0.027	0.003	−0.235*	0.013	0.021	−0.130
	(0.064)	(0.068)	(0.142)	(0.055)	(0.059)	(0.119)
Positive Shock	−0.036	0.028	−0.213*	−0.033	0.009	−0.184*
	(0.058)	(0.063)	(0.121)	(0.053)	(0.057)	(0.106)
ln Interstate Conflict x Negative Shock	0.0001	0.005*	−0.014**	*NA*	*NA*	*NA*
	(0.003)	(0.003)	(0.007)			
ln Interstate Conflict x Positive Shock	0.0004	0.002	−0.0004	*NA*	*NA*	*NA*
	(0.002)	(0.003)	(0.007)			
ln Peacekeeping Forces x Negative Shock	*NA*	*NA*	*NA*	0.0001	0.003	−0.008
				(0.003)	(0.003)	(0.008)
ln Peacekeeping Forces x Positive Shock	*NA*	*NA*	*NA*	−0.0002	0.001	−0.002
				(0.003)	(0.003)	(0.007)
Spatial Index	−0.048	−0.001	−0.057	−0.055	−0.036	−0.079
	(0.042)	(0.043)	(0.101)	(0.038)	(0.040)	(0.086)
Strong Group	2.609***	*NA*	*NA*	3.658***	*NA*	*NA*
	(0.616)			(0.536)		
Weak Group	−1.438***	*NA*	*NA*	−0.788**	*NA*	*NA*
	(0.492)			(0.401)		
Secessionist Group	−1.303***	−0.915**	*none*	−1.617***	−1.599***	*none*
	(0.480)	(0.457)		(0.347)	(0.340)	
Ethnic Group	−2.690***	−0.870	−0.847	−2.552***	−1.162**	4.637**
	(0.527)	(0.615)	(1.708)	(0.493)	(0.566)	(1.839)
Terrorist Group	−3.194***	−3.548***	*none*	−1.440	−2.149**	*none*
	(0.815)	(0.749)		(1.016)	(0.922)	
External Sponsorship	−1.511***	−1.850***	4.899***	−0.967***	−1.596***	4.983***
	(0.250)	(0.252)	(1.200)	(0.235)	(0.242)	(1.442)
Territorial Control	1.808***	0.111	2.380	1.694***	0.065	5.194***
	(0.407)	(0.434)	(1.562)	(0.325)	(0.340)	(1.641)
Constant	5.764***	3.385***	−0.671	5.178***	4.226***	−1.396
	(1.113)	(1.028)	(2.772)	(0.970)	(0.931)	(2.218)
Observations	952	774	178	1,249	1,048	201
Log Likelihood	−2,267.174	−1,774.006	−438.621	−2,981.397	−2,455.544	−468.622
σ^2	6.659	5.598	7.731	6.760	6.242	5.738
Akaike Inf. Crit.	4,568.349	3,578.011	903.242	5,996.795	4,941.089	963.245
Wald Test (df = 1)	245.034***	124.624***	83.694***	371.634***	129.159***	715.462***
LR Test (df = 1)	104.197***	69.985***	33.225***	144.288***	81.509***	82.041***

Note: spatial regression models *p<0.1; **p<0.05; ***p<0.01

port (see Model 8). Specifically, the interaction term that was formed by interacting the intensity of interstate conflict and the *negative shock* variable is positive and statistically significant. This indicates that weak organizations are more apt to target civilians during these periods. Stronger groups, on the other hand, are shown to increase their attacks targeting civilians in the presence of interstate conflict (producing an increase of 3.6% for every one percent increase in the intensity of interstate conflict), but seem to decrease these attacks when interstate conflict occurs in the context of *negative shocks*.

The next hypothesis tested in this section, Hypothesis 11b, predicts that stronger rebel organizations will increase the intensity of their attacks against civilian populations when peacekeepers are present. The logic, as discussed in Chapter 2, is the notion that these groups will seek to undermine the mission. The estimates produced by the spatial regression models provide support for this notion, as a one percent increase in the intensity of peacekeeping forces near rebels is associated with a 5.7% increase in the intensity of attacks targeting civilians (see Model 12). It is noteworthy that no relationship exists between the presence of peacekeeping forces and civilian victimization at the hands of weak rebel groups. Also notable, changing local conditions do not seem to influence these empirical patterns (as indicated by the *local shock* variables).

It is notable, however, that the effect of peacekeepers on civilian victimization at the hands of stronger rebel organizations is marginal. Using the same simulation method employed previously, moving from the minimum intensity of peacekeepers to the maximum leads to an increase in the intensity of these attacks of 11 on the intensity scale. This, given the maximum value of this scale in the simulation, amounts to an increase of just over 2% when holding all the other variables constant. Thus, even though stronger organizations are more apt to target civilians in the presence of peacekeepers, they seem to do so with caution. One reason for this may be the possibility that several violent assaults may attract more peacekeeping forces rather than less – it appears to be the case, therefore, that these groups are trying to straddle a fine line between undermining the mission and leading commanders

on the ground to increase their presence in the area.

In combination with the findings from the previous section, these results seem to indicate that weak organizations tend to remain stationary when peacekeepers arrive and do not shift their behavior in terms of civilian victimization. This is likely because they prefer to enjoy the security-enhancing benefits afforded to them by these forces. Stronger organizations, on the other hand, seem unaffected in terms of their relocation patterns. They do, however, begin to increase their use of violence against civilian targets in a very limited way.

Weaker organizations are also less apt to relocate when interstate conflict is in close proximity. This might be the case because these periods pose significant risk and thus these groups choose to hunker down instead of risk relocation. In addition, when interstate conflict occurs in the context of a *negative shock*, weak groups increase their use of violence against civilian populations. Stronger organizations differ, in that they are more apt to relocate when interstate conflict is occurring nearby – the exception being when this takes place in the context of a *negative shock*. In these instances, they become less apt to move across geographic space. This pattern is identical to that observed when civilian victimization is the dependent variable. Specifically, strong organizations increase this form of violence when interstate conflict increases, yet decrease this form of violence when this takes place in the context of a *negative shock*.

5.2 Conclusion

In this chapter, the humanitarian consequences of rebel relocation were considered. Specifically, statistical models were estimated that explored the role of *local shocks* in leading to relocation, which in turn makes civilian victimization more intense. The first finding in this regard was the role of movement across geographic space in leading to changing patterns of rebel behavior as it pertains to the treatment of civilians. The models found evidence, regardless of model specification or sample, of a curvilinear relationship – civilian deaths

appear to take place during moderate ranges of movement. This is because when relocation is not occurring there is little incentive to behave in this manner, whereas extreme ranges of relocation requires significant resources which leaves little opportunity to target civilians with violence. Though, this empirical pattern might also be picking up on 'hit-and-run' tactics often employed by rebels.

The estimates produces by the statistical models also uncovered some other interesting patterns when considering the full sample (weak and strong groups). First, *positive shocks* are associated with a decrease in the intensity of violence targeting civilians by rebels. This is consistent with the theoretical logic, as the group in question is free to engage in behavior that is in accordance with group goals. In addition, the empirical evidence confirms that weak rebels are more apt to attack civilians. Contrary to existing literature, however, groups that enjoy external sponsorship are actually *less* likely to engage in severe acts of violence targeting civilians. The reversal of this relationship, as it has been established in prior work, might be a result of the disaggregated research design employed here, or the creation of a new measures of civilian victimization via kernel density estimation. Or, the elimination of bias via spatial regression models might also be apt to produce a change in this relationship. In any case, it is notable that this contradicts much of the prior work in this area. Though, it is noteworthy that when estimating the model in a subset of data that only includes strong organizations, the relationship becomes positive and statistically significant. The effect is also powerful – leading to an increase in intensity of 312.7% for stronger groups (see Model 6).

These subsets of data predicated on group strength also found evidence that relocation only has humanitarian consequences of they occur in the context of *negative shocks* (see Model 5). Though, this effect only holds if the rebel organization in question is weak relative to the national government, consistent with Hypothesis 6. This provides support for the notion that when weak organizations are forced to relocate in response to a *negative shock*, they enter a period of desperation in which survival is given precedence over other

goals. Thus, the groups become more apt to raid and loot villages in order to acquire the resources that they need. During periods of *positive shock*, on the other hand, the group perceives the environment to be more secure and are thus not apt to shift their behavior.

These findings, when paired with those presented in Chapter 4, highlight the role that geography plays in the evolution of rebel behavior during wartime. Specifically, much of these shifts are predicated on the characteristics of the locality, as well as how those characteristics change over time. This is because these factors either expand or reduce the range of options available to rebels, and might also incentivize relocation which necessitates a shift in tactics. What has been absent thus far, however, is an account of some transnational influences that are common during civil conflicts. Specifically, the next chapter empirically explores the possibility that militarized interstate conflict and peacekeeping missions have the potential to alter local conditions, sparking important shifts in the behavioral profiles of rebel organizations.

Chapter 6

Digging Deeper into the Relationship Between Peacekeeping Deployments and Rebel Behavior

The previous chapter expanded on Chapter 4 by examining the humanitarian consequences of rebel relocation. By confirming the relationship between changes in local conditions, subsequent relocation and civilian victimization, the central causal mechanism of this study has been confirmed – namely, that forced relocation of rebel organizations during wartime can help explain shifts in rebel group behavior. This chapter explores other potential consequences beyond civilian victimization. Specifically, the role of peacekeeping forces in the diffusion of violence across geographic space is considered. This is in addition to an analysis that attempts to explain variation in the probability that rebels target peacekeepers with violence.

This chapter begins with a reintroduction of the hypothesis under consideration. It is important to note, however, that the only hypothesis that stems from the theory is that which pertains to the use of violence by rebels against peacekeeping forces. The empirical analysis that is concerned with the diffusion of violence across geographic space is performed because the data can be leveraged to address this question – which is relatively common in local-level studies that look at the role of peacekeepers in shaping conflict (see Beardsley, 2011; Beardsley and Gleditsch, 2015; Powers et al., 2015, for a few examples). This reintroduction of the hypothesis will then lead into an outline of the research design that is employed. This is followed by a presentation of the results from the statistical analysis and a discussion of the implications that stem from the findings. Finally, the chapter is concluding by linking the findings presented in this chapter with those presented in Chapter 5 that pertain to peacekeeping forces.

6.1 Rebel Responses to Peacekeeping

6.1.1 Empirical Predictions

While weak rebel organizations are likely to take advantage of the security-enhancing benefits that peacekeepers provide, strong groups have no need for this security. Rather, the presence of these forces undermine strong organizations because they are likely monitoring rebel activity, preventing access to specific areas, and are reducing civilian support. In this sense, there is a strong incentive on part of these organizations to rid themselves of the influence of a peacekeeping mission. One way to accomplish this task is to kill peacekeepers, as it raises the costs on those actors who are actively supporting the mission – especially the countries who are providing the peacekeeping forces. From this, the following is proposed:

Hypothesis 11a *Peacekeeping deployments that occur near strong rebel organizations will be associated with the use of violence against peacekeeping forces.*

6.1.2 Data and Methods

This section tests one hypothesis outlined in the theoretical framework (above), and engages in an empirical analysis of a research question that has been discussed widely in the peacekeeping literature: under what circumstances do peacekeepers inadvertently diffuse violence across geographic space? In the case of the former, the sample is limited by the data availability – violence targeting peacekeepers at the hands of rebels is only available for a small subset of organizations. As such, the sample includes 216 rebel group months in the full sample. When subsetting the sample, there are 115 weak rebel group months and 101 strong rebel group months.

Regarding the former, the full sample consists of 1222 rebel group months. There are 1031 months when looking only at weak organizations, and 191 months when the data are subsetting to only include groups that are stronger relative to the national government. The

growth in the sample relative to previous sets of models (movement and civilian victimization) is due to the dependent variable. The spatial extent of geographic profiles is present regardless if the group was active for consecutive months. As such, there are fewer missing values in the dependent variable vis-a-vis the other empirical chapters.

Variables

There are two dependent variables that are used in the statistical models presented in this section of the chapter. The first is the use of violence targeting civilian populations. As described in Chapter 3, this variable was borrowed from prior work in this area and is a dummy variable that is coded as a 1 if the rebel group in question targeted peacekeepers with the intent to inflict physical harm. Otherwise, it is coded as a 0. The second dependent variable, the spatial extent of rebel organizations, was derived from the geographic profiles created via habitat analysis. The variable is the area of the profile in kilometers. In both cases, the dependent variables are led $(t + 1)$ in order to address the timing at which each respective process is expected to occur. In the case of spatial extent, for instance, the geographic size of the area occupied by rebels is predicted to change in response to the independent variables of interest. Thus, leading the variable is necessary.

In the first set of models, which use violence targeting peacekeepers as the dependent variable, there are two independent variables that are of particular interest to testing Hypothesis 11a. The first is the intensity of peacekeeping forces, which was created via kernel density estimation. As discussed previously, the natural log of this value is taken in order to address skew. The second is the movement of rebel organizations across geographic space. This is the distance traveled in kilometers from time t to time $t+1$, and is logged in order to correct for skew. This variable is important in the context of Hypothesis 11a because movement away from peacekeepers will condition whether or not violence targets these forces. Indeed, rebels will not be able to kill peacekeepers if they choose to move away from these locations.

The second set of models, which use the spatial extent of rebels in geographic space, relies on four independent variables of interest. These variables are then used to create a series of interaction terms. Each of these variables are identical to those used in prior models, and have thus been discussed previously in this chapter (as well as in great detail in Chapter 3). They include the intensity of peacekeeping forces, the range of movement across geographic space, the extent of *negative shocks*, and the extent of *positive shocks*. The values for the intensity of peacekeeping forces, as well as the range of movement across geographic space, are logged in order to correct for skew.

Each set of models also includes control variables in order to account for potentially important factors that might influence the dependent variables. When estimating the models that are used to explain variation in the use of violence against peacekeepers, these controls include the change in the spatial index (to control for *local shocks*), group strength, the spatial index (to control for local-level factors), and territorial control. In the equations used to explain variation in the geographic extent of rebel organizations, the controls include the spatial index (to control for local-level factors), group strength, group type, external sponsorship, and territorial control.

Estimation Technique

Two different model specifications are used in this section. The first is logistic regression because the models that explore the use of violence against peacekeepers rely on a dichotomous dependent variable. In estimating these models, robust standard errors that are clustered on the rebel group are reported. In addition, time-dependence is taken into account by including a cubic polynomial approximation in the equation (Carter and Signorino, 2010).

In order to estimate the models that attempt to explain variation in the spatial extent of rebels, spatial regression models are employed. The spatial weights matrix is based on the neighbor list described in Chapter 3, which means that groups within 200 miles of one another, those who are formally allied, and splinter groups are linked. In each model,

Table 6.1: Local Conditions and the Use of Violence Against Peacekeepers by African Rebel Organizations, 1990 – 2005

	Dependent variable:		
	Violence Targeting Peacekeepers $(t+1)$		
	full sample	*weak groups*	*strong groups*
	(1)	(2)	(3)
ln Intensity of Peacekeeping Forces	0.892^{*}	-1.201^{***}	3.819^{***}
	(0.465)	(0.426)	(1.104)
Spatial Index Change	0.078^{*}	0.052	0.298^{***}
	(0.042)	(0.041)	(0.066)
ln Movement	0.046	-0.488^{***}	-3.294^{***}
	(0.165)	(0.176)	(0.336)
ln Peacekeepers x ln Movement	-0.120^{*}	0.252^{**}	0.481
	(0.073)	(0.127)	(0.294)
ln Peacekeepers x Spatial Index Change	0.003	-0.001	-0.099
	(0.032)	(0.014)	(0.098)
Strong Group	11.796^{***}	*NA*	*NA*
	(1.013)		
Weak Group	9.676^{***}	*NA*	*NA*
	(0.972)		
Spatial Index	-0.131^{*}	-0.080	0.150
	(0.070)	(0.072)	(0.274)
Territorial Control	2.924^{***}	8.552^{***}	7.644^{***}
	(0.747)	(1.042)	(2.949)
Constant	-10.602^{***}	-4.745^{***}	-5.630
	(1.549)	(1.659)	(9.501)
Observations	216	115	101
R^2	0.513	0.159	0.922
χ^2	97.542^{***} (df = 9)	14.056^{*} (df = 7)	99.624^{***} (df = 7)

Note: time controls not reported *p<0.1; **p<0.05; ***p<0.01

spatial autocorrelation was verified via a Moran's I test. In addition, Lagrange multiplier diagnostic tests identified the type of spatial dependence present and was used to select the correct model specification.[1]

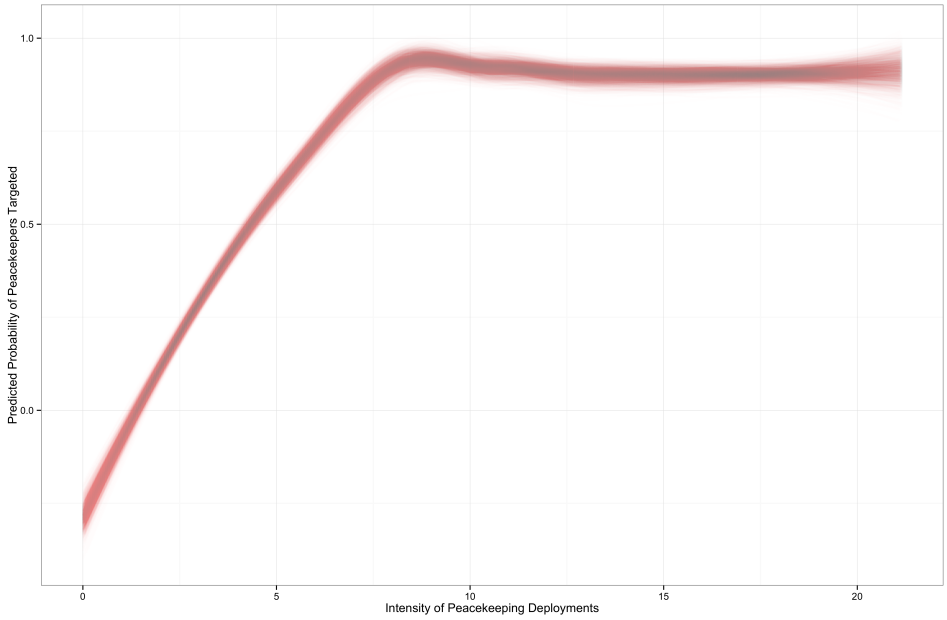


Figure 6.1: Intensity of Peacekeeping Deployments and the Probabilty of Civilian Victimization by Strong Rebel Organizations

6.1.3 Findings

Violence Targeting Peacekeepers

The estimates from the models used to test Hypothesis 11a, that stronger groups will be more likely to attack peacekeepers, can be found in Table 6.1. The estimates provide strong support for this hypothesis, as the model that uses data pertaining to strong organizations reveals a positive, statistically significant relationship (see Model 3). Because the natural log of the variable is used in the equation, this amounts to an increase of 281.81% in the probability of strong organizations attacking peacekeepers relative to the baseline. Weak organizations, on the other hand, are less likely to attack peacekeepers (see Model 2). In addition, it is notable that the interaction term created by combining movement and the intensity of peacekeepers is positive and statistically significant for these groups. This seems to imply that peacekeepers that do spark movement in part of weak rebels do indeed lead to attacks targeting peacekeepers.

[1]The results from these tests can be found in the appendix.

Table 6.2: Local Conditions, Peacekeeping Deployments, and the Diffusion of Civil War Violence in Africa, 1990 – 2005

	Dependent variable:		
	Spatial Extent $(t+1)$		
	full sample	*weak groups*	*strong groups*
	(4)	(5)	(6)
ln Intensity of Peacekeeping Forces	2.673	4.724	−7.103
	(5.107)	(5.454)	(14.294)
ln Movement	42.692**	32.736	156.722***
	(20.885)	(23.121)	(48.214)
ln Peacekeepers x ln Movement	−2.835**	−3.114**	−0.971
	(1.169)	(1.239)	(3.798)
Negative Shock	39.294*	48.991**	15.937
	(23.095)	(24.876)	(61.341)
Positive Shock	−24.572	−10.587	−43.401
	(22.373)	(24.753)	(53.788)
ln Peacekeepers x Negative Shock	2.857**	3.500**	0.107
	(1.306)	(1.370)	(4.217)
ln Peacekeepers x Positive Shock	1.362	1.433	2.446
	(1.300)	(1.404)	(3.400)
Spatial Index	−31.934**	−28.493*	−22.244
	(14.554)	(15.404)	(41.435)
Strong Group	−102.759	*NA*	*NA*
	(178.242)		
Weak Group	−114.746	*NA*	*NA*
	(119.265)		
Secessionist Group	−378.506***	−366.937***	*none*
	(122.739)	(125.063)	
Ethnic Group	−421.881***	−265.580**	−321.089
	(107.909)	(112.697)	(403.249)
Terrorist Group	544.444**	545.812**	*none*
	(258.452)	(254.564)	
External Sponsorship	−169.432**	−176.948**	234.684
	(74.402)	(76.023)	(373.573)
Territorial Control	237.216**	186.660*	494.517
	(93.954)	(98.782)	(370.421)
Constant	1,107.583***	925.095**	282.313
	(347.442)	(359.409)	(1,030.421)
Observations	1,222	1,031	191
Log Likelihood	−10,315.650	−8,683.574	−1,620.551
σ^2	1,233,211.000	1,182,905.000	1,362,675.000
Akaike Inf. Crit.	20,667.290	17,399.150	3,269.102
Wald Test (df = 1)	357.442***	387.355***	5.562**
LR Test (df = 1)	307.779***	299.988***	6.022**

Note: spatial regression models *p<0.1; **p<0.05; ***p<0.01

In terms of substantive effects, Figure 6.1 displays the predicted probability that peacekeepers will be targeted as the intensity of peacekeeping deployments near strong organizations increase. These probabilities were created by setting all dichotomous variables at 0 and continuous variables at their mean, and then simulating the probability of violence based on 1000 different intervals of peacekeeping deployment intensities present in the data.[2] The pattern that is revealed is interesting, as the probability of an attack increases as the intensity of peacekeeping forces in the area increases (as anticipated). The probability reaches 0.95 at roughly half of the observed intensity of peacekeepers, lowers slightly, and then remains relatively static. This suggests that there is a specific threshold in which strong organizations will not tolerate peacekeepers forces near their base of operations. Once this threshold is reached, it is more likely than not that the peacekeeping forces in question will be attacked by rebels.

Also consistent with expectations, the movement of rebel organizations across geographic space is negatively associated with violence targeting peacekeepers. Given the model specifications, this implies one of two things. First, when rebels make the strategic decision to move towards peacekeepers they are less likely to target those peacekeepers. This is likely the case because it is a moment in time in which the armed non-state group in question is seeking to exploit the security-enhancing benefits that these troops afford. Second, the causal arrow might go the other direction – namely, that rebels are in the process of relocating away from peacekeepers and are thus not interesting in attacking them, or are simply do not have the opportunity to launch an attack because they are too preoccupied with moving across geographic space.

Finally, it is notable that those groups who control territory are more likely to target peacekeeping forces if deployed to those locations (see Table 6.1). As discussed previously, this is consistent with the notion that groups that become entrenched at a given location will be more apt to stay and defend those areas. Or, in the case of peacekeeping forces, do what

[2]Note that the width of the line represent the condifence intervals.

they can to deter other actors from interfering with their ability to govern and control what takes place. This implies that the risks for peacekeepers are high when deploying to these locations, which has important implications for not only the civil conflict that peacekeepers are seeking to end, but also the political willingness of participants to continue the mission in the shadow of rebel attacks.

Conflict Diffusion/Spatial Expansion

The estimates produced by the models used to test the notion that peacekeepers might diffuse violence can be found in Table 6.2. The first thing to note in this series of models is the relationship between *negative shocks* and the geographic area occupied by rebels. In the model that used the full sample, this relationship is positive and statistically significant. When subsetting the data based on group strength, however, this relationship only holds for weaker organizations. It is also of notable substantive importance – for every one unit increase in the extent of a *negative shock*, the geographic extent of weak rebel organizations increases by 48.99 kilometers. This variable fails to reach statistical significance when looking at armed non-state actors who are strong relative to the national government.

This finding implies one of two things. First, it is plausible that this empirical pattern suggests that the spatial extent of rebel organizations is estimated to be larger as they relocate across geographic space in response to a *negative shock*. The fact that this relationship does not hold for stronger organizations, however, would mean that they either do not relocate because of *negative shocks* or their strategy of relocation differs fundamentally from that of weaker groups. Given the empirical patterns uncovered in Chapter 4, it is likely that the former is more likely than the latter. Because the estimates created in order to determine where rebels are operating from rely on the known locations of violent events, this findings implies that the diffusion of violence is indeed taking place for weaker organizations.

More insight is gained by looking at the interaction terms and their relation to the the spatial expansion of rebel organizations. First, the interaction term that captures the

intensity of peacekeeping forces and the extent of rebel movement is negative and statistically significant in both the full sample (Model 4) and the model estimated on weak organizations (Model 5). This implies that as weak groups move towards peacekeepers, the spatial range of their violent activity decreases. This could be the case because they become less likely to initiate attacks in the present of peacekeepers, or the security afforded to them by the peacekeeping forces prevents other actors from targeting them. In either case, this provides evidence that peacekeepers are successful in mitigating the diffusion of violence when they are deployed in close proximity to rebels that are weaker relative to the national government. This is not the case of organizations that are stronger relative to the national government, as there is no empirical relationship between peacekeeping forces and the spatial extent of these groups.

Second, the interaction term comprised of the intensity of peacekeepers and the extent of *negative shocks* is positive and statistically significant, but only for weak rebel groups. This finding is important, as it indicates the diffusion of violence across geographic space when peacekeepers are deployed during periods in which local conditions are deteriorating. This is unexpected, as one might expect peacekeepers to be especially welcome as weak groups begin to feel more vulnerable. However, this might be due to the uncertainty surrounding the actions of peacekeepers – indeed, there may be some threshold in which even weak organizations begin to perceive peacekeepers as being a threat to their survival. Or, on the other hand, it might be the case that weak organizations actually remain in close proximity to peacekeepers but begin to engage in violence further away from those locations in order to avoid being sanctioned. If a group loses access to important resources because of a *negative shock*, for example, the incentive to loot and raid villages is born. If peacekeepers are present, however, this will likely take place at more distant locations. Thus, the tactic begins to resemble the 'hit-and-run' tactics often employed by transnational rebels.

Finally, it is worth noting that very few of the factors included in the empirical model are seen to be significant in the case of strong rebel organizations (see Model 6). The spatial

extent of these stronger groups is not influencing by the goal or make-up of the group, nor is it influenced by changing local conditions. Rather, the only significant factor appears to be the range of movement across geographic space. This positive coefficient likely indicates that movement is associated with the acquisition of more territory. The fact that movement does not influence the spatial extent of weak organizations further highlights that this might be the case. Thus, it appears that groups with enough military power to defend themselves are not influenced by group-level or local conditions – rather, they have the autonomy to identify and utilize the geographic space that best suits them.

6.2 Conclusion

The two prior empirical chapters confirmed that rebels strategically select into specific geographic locations, relocate when local conditions begin to deteriorate, and tend to target civilians during the relocation process. This is especially true of weaker rebel organizations, who experience much higher levels of threat during these periods. This chapter extended these findings, especially as they related to the deployment of peacekeeping forces during wartime.

The central hypothesis tested in this chapter found support – strong rebel organizations were found to be more likely to target peacekeepers as the intensity of those deployments increased, whereas weaker groups were less likely to engage in this behavior. The probability of these attacks at the hands of strong rebels presented an interesting pattern. Specifically, the probability of an attack increased dramatically (to roughly 0.95), lowered slightly (roughly 0.9), and then remained relatively constant. This implies a threshold effect, in which strong rebel organizations are not willing to accept high numbers of peacekeepers near their base of operations. In response, therefore, they begin to target these forces in order to undermine the mission. This finding is consistent with that uncovered in Chapter 5, in which peacekeeping deployment in close proximity to strong rebel groups was associated with an

increase in attacks targeting civilians. Thus, by targeting strong rebel organizations directly, peacekeepers are forced to cope with two unintended consequences: (i) attacks on their own forces, and (ii) an increase in civilian victimization by these groups.

In leveraging the geo-referenced data to better understand the conditions that lead to the diffusion of violence, several findings emerged. First, the spatial extent of weaker rebel organizations is influenced by a number of different factors, including the group make-up, goals, external sponsorship, whether or not they control territory and changing local conditions. This is not true of groups that are stronger relative to the national government, as the only significant variable was movement across geographic space. It appears to be the case, therefore, that groups that have enough military power to confront their adversary are able to identify and use the geographic areas that best suit them. Or, on the other hand, are less concerned with the location they occupy because it is not intimately connected with group survival (which is the case for weak groups).

In terms of weak rebels, peacekeepers are shown to be able to deter the diffusion of violence or make it more likely. First, with regard to the former, the findings indicate that when weak groups relocate near peacekeepers the range of their violent events decreases. This is either because they are less likely to engage in these sorts of events, or other actors have fewer opportunities to engage them in the presence of peacekeeping forces. Second, speaking to the latter, there is empirical evidence that even though weak organizations remain near peacekeeping forces, they are still more apt to engage in violent actions during periods of *negative shocks* (likely, targeting civilians). The difference is that the rebels move further away from their base of operations so that the peacekeeping troops are unable to monitor this behavior, which allows them to avoid be punished or identified. In this way, peacekeepers have the potential to diffuse violence across geographic space.

In the next chapter, the findings from this project are summarized and discussed. In addition, a number of potential extensions are outlined.

Chapter 7

Concluding Remarks

This project sought to provide some insight into why rebels shift behavior during wartime. To this end a theory was developed that argued that understanding *where* these organizations chose to base operations, and the motivations driving relocation, interacted to produced fundamental shifts in behavior. Specifically, the logic put forth predicted rebels to strategically choose locations that would maximize their probability of survival. This means different things for different groups, however, as those organizations who are stronger relative to the national government enjoy more autonomy in this decision vis-a-vis their weaker counterparts. Borrowing a method of ecology (ENFA), this study confirmed this notion by producing evidence that weaker groups are much more specialized when compared to stronger organizations – which means that they occupy geographic space that is conducive to rebel behavior consistently over time. Stronger organizations, on the other hand, prefer certain local-level features but do not remain at those locations over time.

The argument pertaining to the decision to relocate argued that changes in local conditions is what determined whether or not this choice was made. Changes, however, take different forms. Instances in which local-conditions improved, which the theory termed *positive shocks*, were not predicted to lead to relocation because an incentive is born to remain stationary in order to enjoy the benefits of this shift in the locality. Cases in which local-conditions deteriorate and begin threaten group survival, termed *negative shocks*, were expected to produce a strong incentive to relocate in order to find a location more suitable to rebellion. The empirical models used to test this argument found that only *negative shocks* were associated with relocation of rebels across geographic space. The effect was such that

moving from the minimum to the maximum extent of a *negative shock* is estimated to produce an increase in movement of roughly 40 kilometers during the month in question. This equates to a 37% increase. No relationship was found to exist between *positive shocks* and patterns of rebel relocation.

These two findings regarding the location of these groups, and their likely response to changing local conditions, justified an empirical test of an important related question – what are some potential consequences of relocation during wartime? The theory predicted that because *negative shocks* constitute forced relocation, that the level of threat perceived by rebels would increase dramatically during these periods. The reason is that these organizations are being forced away from the local-level factors that provided them with physical security and access to important resources. As such, these periods in time represent a moment of desperation in which short-term survival is given precedence over long-term goals and aspirations. Because of this, the theory expects the intensity of violence targeting civilians to increase as an incentive is born to launch raids on villages in order to acquire resources. This relationship is conditioned by group strength, however, as the level of threat posed to stronger organizations is dramatically lower relative to their weaker counterparts. As such, only weak groups are predicted to resort to relying upon these suboptimal tactics.

The spatial regression models estimated to test this expectation found support, as *negative shocks* that lead to relocation were associated with increased levels of civilian victimization at the hands of weaker groups. Stronger organizations, on the other hand, appeared to be unaffected by both forms of *local shocks* in terms of their use of violence against civilians. In addition to this finding, the models also found that a nonlinear relationship exists between rebel movement across geographic space and the intensity of civilian victimization. This is likely because the incentive to engage in this form of behavior does not exist while relocation is not occurring, in combination with the fact that those groups who are moving extreme distances do not have the time and/or resources to target civilian populations. This finding holds when estimating the model on the full sample, and also for both strong and weak

rebel organizations when using subsetted data. The pattern, however, was not a perfect inverted-U. Rather, the intensity of civilian victimization increases dramatically and then begins to decline once movement begins to increase further.

Confirmation that relocation that is sparked via *negative shocks* is associated with the use of violence targeting civilians begs the question – what other sources of *local shocks* might be important? As the topic at hand are active civil conflicts, the next step in this project was to explore two transnational factors that are commonplace during these violent periods: militarized interstate conflict and international peacekeeping deployments. Regarding interstate conflict, the theory predicted that the closer this occurred in geographic space to the rebels, the more apt this event would function as a *negative shock*. As such, it would incentivize relocation on part of rebels due to the influx of war-fighting resources from the national government and external state (especially for weaker groups). Peacekeeping deployments, on the other hand, were hypothesized to provide security-enhancing benefits to those rebels who were weaker relative to the national government. Stronger groups, on the other hand, would likely do what they could to undermine the mission in order to avoid being monitored.

The empirical evidence suggests that the opposite is true of rebel behavior in the context of interstate competition – strong organizations were more apt to relocate during interstate conflict, whereas weaker groups were more apt to remain stationary. This, as discussed previously, might be the case because movement during this moment in time is risky. *Negative shocks* that occur in the context of interstate conflict, however, leads weaker organizations to increase their attacks targeting civilians and also makes them more likely to move across geographic space. With regard to international peacekeeping deployments, the findings confirm the expectation that weak organizations will remain stationary when peacekeepers are deployed nearby. They are also less likely to kill peacekeepers, which is not true of their stronger counterparts. In addition to targeting peacekeepers, stronger organizations are also more apt to kill civilians when peacekeepers are present. There is strong evidence, therefore,

that strong rebel groups seek to undermine peacekeeping missions when they are nearby.

7.1 What Does it All Mean?

Very simply stated, the findings presented in this project show that location matters. It matters for rebels, in the sense that they strategically select those locations that improve their prospects for survival. It also matters for the national government and external actors, as the manner in which they deploy to these locations alter the way in which rebels perceive their security environment. This fact is especially salient for international peacekeepers, as deploying in close proximity to a strong rebel organizations has the potential to lead to more civilian deaths, something that these missions have a keen interest in preventing (Diehl and Druckman, 2010). Peacekeepers are also much more likely to die at the hands of rebels when they deploy near rebels that are strong relative to the national government. This can be costly, as deaths inflicted by rebels on peacekeepers might undermine political support for the mission.

This finding, as it pertains to civilian deaths, is not necessarily inconsistent with that reported by Hultman et al. (2013) – who find that having boots on the ground in the most effective way to prevent civilian deaths during internal conflicts. It does raise some questions, however, with the most prominent stemming from what Townsen and Reeder (2014) refer to as the 'second stage' of a peacekeeping mission.[1] Every peacekeeping mission, regardless of troop allotments, has to cope with finite resources. Indeed, no one mission has enough manpower to protect every civilian on the ground. Nor do commanders on the ground have perfect information about where violence has taken place, and where it will be apt to erupt in the future. Inherent in this strategic reality is the fact that peacekeepers will be successful at some locations, but fail to protect civilians at others. Thus, though Hultman et al. (2013) finds that peacekeepers are successful in the aggregate under some circumstances, the study

[1]This refers to day-by-day decisions about where to send troops and supplies.

provides little insight into the mechanisms associated with success at the local-level.

The findings presented in this project provides insight into this aspect of peacekeeping missions, and not only identify factors associated with success, but also has some insight pertaining to failure at the local-level. In particular, when attempting to monitor and control the behavior of stronger rebel groups, there are a series of difficult decisions to make. Targeting these groups directly with peacekeeping forces is apt produce an increase in civilian casualties, and also increases the likelihood that peacekeepers are killed at the hands of rebels. Failure to target these groups directly, on the other hand, allows the rebels in question to enjoy relative autonomy and likely does little to pressure them to a point where settlement might be likely. Or, alternatively, to the point where they will not renege on an agreement that has been put in place. From a peacekeeping commander's perspective, then, there is a need to determine whether the short-term costs of targeting the group are worth it in the sense it saves more lives in the long-run.

The findings produced by this study also presents a nuanced explanation of weak rebel behavior in the context of peacekeeping deployments. First, weak rebel organizations appear apt to remain stationary when peacekeepers target them directly. By doing so they are able to exploit the security-enhancing benefits of the troops. This might be a dangerous prospect, however, as decreasing the level of threat posed to the group might actually prolong the civil conflict. Thus, there is a need for peacekeepers to engage in active monitoring and prevent these weaker groups from rearming, or engaging in simliar behavior that might make the recurrence of conflict more likely.

A second aspect of the behavior of weak groups seems to be how they react to *negative shocks* when peacekeepers are present. Per the empirical analysis, during these periods the spatial extent of violent events in which the group participates increases. This implies that the incentive to target civilians remains during these moments, but rebels are forced to move to distant locations in order to engage in this tactic – thus, producing the diffusion of violence across geographic space. In this way, peacekeepers might be providing rebels with a sense

of physical security but are unable to monitor their behavior once it extends to a certain point on the periphery. By targeting civilians at these locations, weak rebel organizations are able to avoid being observed and thus can prevent being punished for these actions. If this is indeed the case, the amount of boots on the ground at the location in question is vital – which is consistent with Hultman et al. (2013).

In addition to the implications of this study for peacekeeping, the findings pertaining to interstate conflict are also noteworthy. Regarding the movement of rebels across geographic space, both weak and strong rebel organizations decrease their movement across geographic space during periods of interstate conflict. The likely reason for this finding is that as resources flow into the location from the government and third-party, movement becomes a risky proposition. Thus, what movement does occur is done cautiously. Interestingly, however, when interstate conflict occurs in the context of a *negative shock* weak organizations actually increase their range of movement across geographic space. This seems to imply that these groups perceive extreme threat and take the risk to relocate as quickly as possible. The notion that this movement is 'forced' is supported by the additional finding that weak groups are more apt to kill civilians during these moments, as well.

From the point of view of scholars of international conflict, this findings confirms the flood of work that has found an important relationship between interstate and internal conflicts (see Gleditsch et al., 2008; Salehyan, 2008, 2009; Schultz, 2010; Reeder, 2014, 2015, for some examples). From a policymaking perspective, it implies a strong need to manage inter-intrastate conflicts simultaneously – especially because regimes involved in internal war at home are much more likely to become involved in interstate conflict (Gleditsch et al., 2008). The reason is that both forms of conflict tend to exacerbate one another, with civilians caught in the crossfire suffering much of the costs of escalation.

Finally, the importance of specific local-level factors, especially for groups that are weak relative to the national government, imply that the duration of conflicts might be minimized by making this geographic space less conducive to rebel behavior. This is not imply that

forests need to be burned down, mountains exposed, and natural resources purged from the area – rather, it means that troops need to be present, and technology should be leveraged in order to monitor and expose human rights abuses that take place in the context of war. Though this appears on its face to be a difficult proposition, especially in large countries such as the DRC, it is possible if a reliable estimate of rebel location can be achieved. Though the method advocated in this project is not perfect, there remains some real policy-based benefits to refining a method that can assist in monitoring armed non-state actors embroiled in conflict.

7.2 Scope Conditions and Limitations

This project is bounded by three important scope conditions that warrant mention. First, the theory outlined in this project assumes a high level of organization on the part of rebel organizations. As such, the findings presented herein are not intended to be generalizable to other groups that often participate in political violence. Nor do I make the argument that the theoretical logic would apply to other forms of armed non-state actors. This includes less organized rebel organizations with a lack of a central command structure, transnational terrorist groups, criminal organizations, or other loosely structured non-state actors. This is not to say that there is nothing useful found in this project that might be applied to other cases. Indeed, the role of physical security and resources is likely to be important to all relatively weaker non-state entities, though the processes driving acquisition is apt to vary depending on a number of group-level factors.

The trade-off in this case pertains to the notable variation among these group-level factors. By focusing solely on rebel organizations with a clear command structure that are currently engaged in civil conflict, I am able to control for many group-level factors that might be driving the behavior of a given group. In the case of organized rebel organizations, for instance, there is very little incentive on part of the group to guard the identities of those

involved in the fighting or the general location of the organization. This is not the case for other forms of non-state actors, as there is a need to hide the identity of participants in order to avoid punishment, which is often severe (Kalyvas, 2006). This means that formally organized groups will be more willing to operate openly, revealing their method of acquiring resources and surviving in a local environment characterized by uncertainty. Group-level characteristics matter, of course, but by only including organized groups involved in a specific definition of civil war I am able to limit the amount of variation that it would be necessary to account for (both theoretically and empirically). The sacrifice, as previously mentioned, is the non-generalizability of the findings across other forms of non-state groups.

The second scope condition pertains to a core assumption in the theoretical framework – the presence of a weak state. As will be described in greater detail in Chapter 2, the ability of a rebel organization to seek out geographic space that is more suitable to rebels is predicated on an adversary that is unable to control a large proportion of its territory. Indeed, the logic described only works if there is in fact geographic space that is conducive to rebel behavior. This, by definition, must be the case to some degree for any civil war to occur. Though, the logic obviously works best if the group in question has a choice to make when it comes to where to base operations from. The onset of a *local shock* will not lead to rebel relocation, for example, if there is no place to relocate to. Though this is partially accounted for in this study when controlling for the range of push/pull factors and the spatial extent of conducive geographic space, it warrants mention. It is notable, however, that there is nearly always new geographic space that rebels find preferable to move to. In Rwanda, a state roughly the size of Massachusetts, the government is able to control the entire territory with ease. This simply means that rebel organizations often choose to operate across international borders during periods of civil violence (Autesserre, 2010).

Finally, the third scope condition is the temporal and spatial domain of the study. Because of data constraints, the empirical tests of the theory are limited to the African continent between 1990-2010. Though this is less than ideal, this sample provides a sufficient number

of rebel organizations and periods of civil conflict to explore the mechanisms described in this project. This is due to the unfortunate fact that Africa has long been a hot spot of prolonged civil conflict. Many of these wars have involved multiple armed rebel organizations, with many of those being classified as formally organized.[2] In addition, a large proportion of African states that have been embroiled in civil wars during the study period are relatively large (in terms of the size of territory) and are governed by weak regimes. There is opportunity on the part of armed non-state actors, therefore, to seek out geographic space that is conducive to rebel behavior. In the context of the theoretical logic put forth in this project, this means that the influence of *local shocks* on shifts in the behavioral profiles of rebels should be significant.

It might be argued that there are other limitations to this study, as well. In particular, the behavioral profiles used in this project encompass the behavior of the group across geographic space, as well as the propensity for violence at specific moments. In operationalizing rebel behavior in this way, I am not implying that these are the only forms of behavior that should be of interest to scholars and policymakers. Indeed, rebel organizations engage in a wide array of behavior, many of which are nonviolent. In an ideal world, all scholars would be able account for the most important of this behavior in order to understand why rebels behave the ways in which they do. As is true in much of the quantitative literature, however, data constraints make this difficult (if not impossible).

This concern is especially salient when estimating where rebels are operating from during specific moments. The spatial technique that is used, which is discussed in great detail in Chapter 3, estimates where rebels are located based on the known locations of events that are associated with the group. Because the only known events are violent, one could argue that the estimates actually represent geographic profiles of violence, rather than a geographic profile that is consistent with where the organization is operating from. Though this is a valid concern, the fact that rebels do not have complete control over the violent interactions

[2]More details on what it means to be "formally organized" can be found in Chapter 3.

that they have with other actors helps to alleviate the problem. Moments in which the rebel organization in question gets involved in a competition with another armed non-state group and also those instances when the government launches attacks against the group, are likely to take place near the area that the group is occupying. In other words, even though they would prefer to avoid conflict near their base of operations, this is not always possible. The resulting estimates, therefore, are likely representative of where they fight, as well as where they go to engage in nonviolent behavior.

Appendix

I. List of Rebel Organizations Included in Analysis

Group Name	Months	Group Name	Months
ADF	68	AFDL	22
AFRC	10	Ahlu Sunna Waljamaca	17
Ahlul Sunnah Jamaa	3	AIAI	8
AIS	53	al-Gama'a al-Islamiyya	61
al-Qaida	1	Al-Shabaab	37
AN	4	ANC	15
ANC - 'Greens'	5	ANC - 'Reds'	5
AQIM	132	ARPCT	7
Arrow Boys	4	ARS/UIC	32
ATNMC	9	AWB	2
Bakassi boys	1	Bangadi Militia	1
BDK	5	CATA	8
CNDD	44	CNDD-FDD	67
CNDP	19	CNR	1
Cobras	5	Cocoyes	14
Codeta	8	CPJP	10
CRA	5	CSNPD	9
DSA	4	EIJM - AS	17
EPLF	15	EPRDF	13
FAPC	4	FARF	6
FDLR	93	FDR	2
FIAA	6	FLAA	8
FLEC-FAC	53	FLEC-R	39
FN - IC	2	FNI	13
FNT	1	Forces of Abdirizak Bihi	1
Forces of Abdullahi Yusuf	5	Forces of Abdurahman Ahmed Ali 'Tur'	11
Forces of Ahmed Sheikh Buraleh	1	Forces of Francois Bozize	4
Forces of General Morgan	16	Forces of Hussein Ali Ahmed	3
Forces of Jama Ali Jama	4	Forces of Omar Jess	12
Forces of Yussuf Hajji Nur	1	FPR	32
FRCI	4	FRF	2
Frolina	2	FRPI	3
FRUD	12	FRUD - AD	5
FUCD	4	GIA	106
GIA - El Ahd Battalion	1	GIA - El Forkane	1

GIA - El Khadra Battalion	2	Harakat Ras Kamboni	2
Hizbul Islam	17	Hutu rebels	59
IFP	17	IGLF	1
INPFL	7	Interahamwe, ex-FAR	5
Islamic Legion	4	Jama'atu Ahlis Sunna Lidda'awati wal-Jihad	2
Janjaweed	79	Janjaweed - Bin Kulaib faction	1
Janjaweed - Moro faction	1	JEM	28
JVA	8	JVA faction	3
Kamajors	10	LDF	12
LPC	36	LRA	244
LURD	37	MAGRIVI	10
Mayi Mayi	45	Mayi Mayi - Chinja Chinja	4
Mayi Mayi - Ngilima	6	Mayi Mayi Complet	1
MDD	5	MDF	1
MDJT	18	MFDC	70
MFDC - FN	4	MFDC - S	2
MFDC Front Nord - MD	2	Military faction	1
Military faction (forces loyal to Lon M'Ba)	2	Military faction (forces of Andr Kolingba)	4
Military faction (forces of Maldoum Bada Abbas)	1	Military Junta for the Consolidation of Democracy, Peace and Justice	6
MILOCI	1	MJP	2
MLC	14	MNJ	15
MODEL	3	MPA	5
MPCI	16	MPGK	3
MPIGO	6	MPS	3
Mujahideen in the Golis Mountains	10	Mungiki	8
Naparama	3	NDA	44
NDPVF	9	NDV	6
Ninjas	17	NPFL	72
NRF	6	Ntsiloulous	21
NUM	3	OLF	89
ONLF	109	PAC	8
Palipehutu	3	Palipehutu-FNL	111
Palipehutu-FNL - LP	2	PARECO	7
PDF	1	PFNR	1
Puntland state of Somalia	14	PUSIC	2
RAFD	4	Rastas	8
RCD	58	RCD - CP	1
RCD - LN	5	RCD-K-ML	10
RCD-ML	14	RCD-N	1
Renamo	33	Republic of Somaliland	18
RFDG	8	RRA	40
RRA - MH	14	RUF	82
SLDF	16	SLM/A	49
SLM/A - MM	10	SLM/A-Unity	7
SNF	5	SNF - MSAB	2
SNM	11	SNM - 'Calan cas'	3
SPLM/A	140	SPLM/A - AH	3
SPLM/A - WN	3	SPM	19

SPM/SNA	8	SRRC	12
SSDF	47	SSDM/A	9
SSUM/A	8	Takfir wa'l Hijra	6
Tawhid wal Jihad	2	UFDD	6
UFDR	3	UFR	3
UFRA	3	ULIMO	21
ULIMO - J	8	ULIMO - K	28
UNITA	113	UNRF II	4
UPA	13	UPC	18
USC-PM	1	USC/SNA	59
USC/SNA - OA	18	USC/SSA	17
USC/SSA - OMF	10	Uwusa	3
WNBF	14	WSB	1

II. Model Specification Tests (spatial regression)

Chapter 4

Moran's I Test

	Moran's I Statistic	Expectation	Variance	P-Value
Model 1	0.092	-0.006	0.001	0.001
Model 2	0.092	-0.006	0.001	0.001
Model 3	0.092	-0.006	0.001	0.001
Model 4	0.092	-0.006	0.001	0.001
Model 5	0.103	-0.005	0.001	0.001
Model 6	0.123	-0.006	0.001	0.001
Model 7	0.238	-0.016	0.001	0.001
Model 8	0.191	-0.006	0.001	0.001
Model 9	0.211	-0.008	0.001	0.001
Model 10	0.219	-0.022	0.001	0.001

Lagrange Multiplier Diagnostic

	Lag Test	Error Test	Lag Test (robust)	Error Test (robust)	Model Choice
Model 1	149.97	250.59	8.38	109.01	Spatial Error
	(0.001)	(0.001)	(0.004)	(0.001)	
Model 2	151.79	247.66	9.28	105.14	Spatial Error
	(0.001)	(0.001)	(0.002)	(0.001)	
Model 3	150.29	250.71	8.36	108.78	Spatial Error
	(0.001)	(0.001)	(0.004)	(0.001)	
Model 4	151.45	248.97	9.05	106.57	Spatial Error
	(0.001)	(0.001)	(0.003)	(0.001)	
Model 5	169.86	130.07	49.68	9.89	Spatial Lag
	(0.001)	(0.001)	(0.001)	(0.002)	
Model 6	97.81	143.03	5.98	51.20	Spatial Error
	(0.001)	(0.001)	(0.014)	(0.001)	
Model 7	112.18	98.69	15.48	1.99	Spatial Lag
	(0.001)	(0.001)	(0.001)	(0.159)	
Model 8	165.18	365.79	0.01	200.62	Spatial Error
	(0.001)	(0.001)	(0.929)	(0.001)	
Model 9	108.30	370.52	8.29	270.51	Spatial Error
	(0.001)	(0.001)	(0.004)	(0.001)	
Model 10	28.17	47.01	0.05	18.90	Spatial Error
	(0.001)	(0.001)	(0.821)	(0.001)	

Note: the p-values are in parentheses.

Chapter 5

Moran's I Test

	Moran's I Statistic	Expectation	Variance	P-Value
Model 1	0.156	-0.003	0.001	0.001
Model 2	0.169	-0.003	0.001	0.001
Model 3	0.151	-0.003	0.001	0.001
Model 4	0.150	-0.003	0.001	0.001
Model 5	0.115	-0.003	0.001	0.001
Model 6	0.331	-0.011	0.001	0.001
Model 7	0.128	-0.005	0.001	0.001
Model 8	0.129	-0.006	0.001	0.001
Model 9	0.146	-0.017	0.001	0.001
Model 10	0.113	-0.005	0.001	0.001
Model 11	0.085	-0.005	0.001	0.001
Model 12	0.173	-0.017	0.001	0.001

Lagrange Multiplier Diagnostic

	Lag Test	Error Test	Lag Test (robust)	Error Test (robust)	Model Choice
Model 1	494.45	1049.10	22.20	576.85	Spatial Error
	(0.001)	(0.001)	(0.002)	(0.001)	
Model 2	577.84	1228.33	18.20	668.69	Spatial Error
	(0.001)	(0.001)	(0.002)	(0.001)	
Model 3	471.31	982.70	23.99	535.38	Spatial Error
	(0.001)	(0.001)	(0.002)	(0.001)	
Model 4	470.58	961.20	25.95	516.57	Spatial Error
	(0.001)	(0.001)	(0.002)	(0.001)	
Model 5	222.15	467.39	3.54	248.78	Spatial Error
	(0.001)	(0.001)	(0.059)	(0.001)	
Model 6	290.12	417.09	17.98	144.95	Spatial Error
	(0.001)	(0.001)	(0.002)	(0.001)	
Model 7	84.12	202.59	0.29	118.75	Spatial Error
	(0.001)	(0.001)	(0.591)	(0.001)	
Model 8	81.42	156.30	1.54	76.41	Spatial Error
	(0.001)	(0.001)	(0.215)	(0.001)	
Model 9	28.68	36.94	2.82	11.07	Spatial Error
	(0.001)	(0.001)	(0.093)	(0.001)	
Model 10	129.64	211.52	10.82	92.69	Spatial Error
	(0.001)	(0.001)	(0.002)	(0.001)	
Model 11	64.68	99.77	4.65	39.74	Spatial Error
	(0.001)	(0.001)	(0.031)	(0.001)	
Model 12	27.98	48.23	0.35	20.60	Spatial Error
	(0.001)	(0.001)	(0.552)	(0.001)	

Note: the p-values are in parentheses.

Chapter 6

Moran's I Test

	Moran's I Statistic	Expectation	Variance	P-Value
Model 4	0.207	-0.005	0.001	0.001
Model 5	0.232	-0.005	0.001	0.001
Model 6	0.014	-0.016	0.001	0.001

Lagrange Multiplier Diagnostic

	Lag Test	Error Test	Lag Test (robust)	Error Test (robust)	Model Choice
Model 4	711.68	1079.41	93.79	461.52	Spatial Lag
	(0.001)	(0.001)	(0.001)	(0.001)	
Model 5	683.75	1122.20	78.64	517.08	Spatial Lag
	(0.001)	(0.001)	(0.001)	(0.001)	
Model 6	8.88	0.41	*NA*	*NA*	Spatial Lag
	(0.002)	(0.522)			

Note: the p-values are in parentheses.

References

Alesina, A., A. Devleeschauwer, W. Easterly, S. Kurlat, and R. Wacziarg (2003). Fractionalization. *Journal of Economic Growth 8*(2), 155–194.

Arena, P. and B. Hardt (2014). Incentives to rebel, bargaining, and civil war. *International Interactions 40*(1), 127–141.

Arieff, A. and L. Ploch (2014). *The Lord's Resistance Army: The U.S. Response*. Congressional Research Service.

Arnold, M. and M. LeRiche (2013). *South Sudan: From Revolution to Independence*. Oxford, UK: Oxford University Press.

Autesserre, S. (2010). *The Trouble with the Congo: Local Violence and the Failure of International Peacebuilding*. Cambridge: Cambridge University Press.

Ayoob, M. (2001). State making, state breaking, and state failure. In *Turbulent Peace: The Challenges of Managing International Conflict*. United States Institute of Peace Press.

Azam, J.-P. (2001). The Redistributive State and Conflicts in Africa. *Journal Of Peace Research 38*(4), 429–444.

Azam, J.-P. and A. Hoeffler (2002). Violence against civilians in civil wars: Looting or terror? *Journal of Peace Research 39*(4), 461–485.

Bakke, K. M., K. G. Cunningham, and L. J. Seymour (2012). A plague of initials: Fragmentation, cohesion, and infighting in civil wars. *Perspectives on Politics 10*(2), 265–283.

Balcells, L. (2010). Rivalry and revenge: Violence against civilians in conventional civil wars. *International Studies Quarterly 54*(2), 291–313.

Balcells, L. (2011). Continuation of politics by two means: Direct and indirect violence in civil war. *Journal of Conflict Resolution 55*(3), 397–422.

Beardsley, K. (2011). Peacekeeping and the contagion of armed conflict. *Journal of Politics 73*(4), 1051–1064.

Beardsley, K. and K. S. Gleditsch (2015). Peacekeeping as conflict containment. *International Studies Review 17*(1), 67–89.

Bhavnani, R., K. Donnay, D. Miodownik, M. Mor, and D. Helbing (2014). Group segregation and urban violence. *American Journal of Political Science 58*(1), 226–245.

Boix, C. (2008). Economic roots of civil wars and revolutions in the contemporary world. *World Politics 60*(3), 390–437.

Booth, J. A. (1991). Socioeconomic and political roots of national revolts in central america. *Latin American Research Review 26*(1), 33–73.

Boswell, T. and W. Dixon (1993). Marx's theory of rebellion: A cross-nation analysis of class explotation, economic development, and violent revolt. *American Sociological Review 58*(5), 681–702.

Braithwaite, A. (2010). Midloc: Introducing the militarized interstate dispute (mid) location dataset. *Journal of Peace Research 47*(1), 91–98.

Braithwaite, A. and S. D. Johnson (2012). Space-time modeling of insurgency and counterinsurgency in iraq. *Journal of Quantitative Criminology 28*(1), 31–48.

Bruckner, M. and A. Ciccone (2010). International commodity prices, growth and the outbreak of civil war in sub-saharan africa. *The Economic Journal 120*(544), 519–534.

Buhaug, H. and S. Gates (2002). The geography of civil war. *Journal of Peace Research 39*(4), 417–433.

Buhaug, H. and K. S. Gleditsch (2008). Contagion or Confusion? Why Conflicts Cluster in Space. *International Studies Quarterly 52*(2), 215–233.

Buhaug, H., K. S. Gleditsch, H. Holtermann, G. Ostby, and A. F. Tollefsen (2011). It's the Local Economy, Stupid! Geographic Wealth Dispersion and Conflict Outbreak Location. *Journal of Conflict Resolution 55*(5), 814–840.

Byman, D. (1998). The logic of ethnic terrorism. *Studies in Conflict and Terrorism 21*(2), 149–169.

Capaccio, T. (2011). *Obama Sends Troops Against Uganda Rebels*. Bloomberg News.

Carey, S. C. (2006). The dynamic relationship between protest and repression. *Political Research Quarterly 59*, 1–11.

Carter, D. B. and C. S. Signorino (2010). Back to the future: Modeling time dependence in binary data. *Political Analysis 18*, 271–92.

Chalk, P. (2000). Liberation tigers of tamil eelam's (ltte) international organization and operations: A preliminary analysis. In *Commentary No. 77*. Canadian Security Intelligence Service Publications.

Collier, P. (2000). Rebellion as a Quasi-Criminal Activity. *Journal of Conflict Resolution 44*(6), 839–853.

Collier, P., V. Elliott, H. Hegre, A. Hoeffler, M. Reynal-Querol, and N. Sambanis (2003). *Breaking the Conflict Trap: Civil War and Development Policy*. Oxford, UK: Oxford University Press.

Collier, P. and A. Hoeffler (1998). On the Economic Causes of Civil War. *Oxford Economic Papers 50*(4), 563–573.

Collier, P. and A. Hoeffler (2001). Greed and Grievance in Civil War. *World Bank Policy Research Working Paper 2355*.

Collier, P. and A. Hoeffler (2002). On the Incidence of Civil War in Africa. *Journal of Conflict Resolution 46*(1), 13–28.

Costalli, S. (2013). Does peacekeeping work?: A disaggregated analysis of deployment and violence reduction in the bosnian war. *British Journal of Political Science 44*(2), 1–24.

Cunningham, D. E., K. S. Gleditsch, and I. Salehyan (2009). It takes two: A dyadic analysis of civil war duration and outcome. *Journal of Conflict Resolution 53*(4), 570–597.

Denny, E. K. and B. F. Walter (2014). Ethnicity and civil war. *Journal of Peace Research 51*(2), 199–212.

Denov, M. (2010). *Child Soldiers: Sierra Leone's Revolutionary United Front*. Cambridge: Cambridge University Press.

Diehl, P. F. and D. Druckman (2010). *Evaluating Peace Operations*. Boulder, CO: Lynne Rienner Publishers.

Diehl, P. F. and G. Goertz (2000). *War and Peace in International Rivalry*. Ann Arbor, MI: University of Michigan Press.

Doll, C.N.H., J. M. and J. Morley (2007). Mapping regional economic activity from night-time light satellite imagery. *Ecological Economics 57*(1), 75–92.

Dorussen, H. and A. Ruggeri (2011). Introducing PKOLED: A Peacekeeping Operations Location and Event Dataset.

Eck, K. and L. Hultman (2007). One-sided violence against civilians in war: Insights from new fatality data. *Journal of Peace Research 44*(2), 233–246.

Elbadawi, I. and N. Sambanis (2000). Why Are There So Many Civil Wars in Africa? Understanding and Preventing Conflict. *Journal of African Economies 9*(3), 244–269.

Fearon, J. D. (2005). Primary commodity exports and civil war. *Journal of Conflict Resolution 49*(4), 483–507.

Fearon, J. D. and D. D. Laitin (2003). Ethnicity, Insurgency, and Civil War. *American Political Science Review 97*(1), 75–90.

Fieberg, J. and C. Kochanny (2005). Quantifying home-range overlap: the importance of the utilization distribution. *Journal of Wildlife Management 69*, 1346–1359.

Fischer, M. and B. Schmelzle (2009). *Building Peace in the Absence of States: Challenging the Discourse on State Failure*. Berlin: Berghof Research Center.

Fjelde, H. and D. Nilsson (2012). Rebels against rebels: Explaining violence between rebel groups. *Journal of Conflict Resolution 56*(4), 604–628.

Fortna, V. P. (2003). Inside and Out: Peacekeeping and the Duration of Peace After Civil and Interstate Wars. *International Studies Review 5*(4), 97–114.

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

Fortna, V. P. (2008). *Does Peacekeeping Work?: Shaping Beligerents' Choices After Civil War*.

Gartner, S. S. and P. M. Regan (1996). Threat and Repression: The Non-Linear Relationship between Government and Opposition Violence. *Journal Of Peace Research 33*(3), 273–287.

Gates, S. (2002). Recruitment and Allegiance: The Microfoundations of Rebellion. *Journal of Conflict Resolution 46*(1), 111–130.

Gettleman, J. and E. Schmitt (2009). *U.S. Aided a Failed Plan to Rout Ugandan Rebels*. The New York Times.

Ghobarah, H. A., P. Huth, and B. Russett (2003). Civil Wars Kill and Maim People Long After the Shooting Stops. *American Political Science Review 97*(2), 189–202.

Gilmore, E., N. P. Gleditsch, P. Lujala, and J. R. Ketil (2005). Conflict Diamonds: A New Dataset. *Conflict Management and Peace Science 22*(3), 257–272.

Gleditsch, K. S., I. Salehyan, and K. A. Schultz (2008). Fighting at Home, Fighting Abroad: How Civil Wars Lead to International Disputes. *Journal of Conflict Resolution 52*(4), 479–506.

Gurr, T. R. (1970). Why Men Rebel. (0).

Hansen, Matthew C., S. V. S. and P. V. Potapov (2010). Quantification of global gross forest cover loss. *PNAS 107*(19), 8650–8655.

Harari, M. and E. L. Ferrara (2012). Conflict, climate and cells: A disaggregated analysis. *Innocenzo Gasparini Institute for Economic Research Working Paper No. 461*.

Hazen, J. M. (2013). *What Rebels Want: Resources and Supply Networks in Wartime*. Ithaca, NY: Cornell University Press.

Hegre, H., G. Ostby, and C. Raleigh (2009). Poverty and civil war events: A disaggregated study of liberia. *Journal of Conflict Resolution 53*(4), 598–623.

Hegre, H. v., T. Ellingsen, S. Gates, and N. P. Gleditsch (2001). Toward a Democratic Civil Peace? Democracy, Political Change, and Civil War, 1816–1992. *American Political Science Review 95*(1), 33–48.

Henderson, E. A. and J. D. Singer (2000). Civil War in the Post-Colonial World, 1946-92. *Journal Of Peace Research 37*(3), 275–299.

Henderson, E. A. and R. Tucker (2001). Clear and Present Strangers: The Clash of Civilizations and International Conflict. *International Studies Quarterly 45*(2), 317–338.

Hendrix, C. S. and I. Salehyan (2014). Social conflict in africa database (scad). *www.scaddata.org*.

Hensel, P. (1996). Charting a Course to Conflict: Territorial Issues and Interstate Conflict, 1816-1992. *Conflict Management and Peace Science 15*(1), 43–74.

Hoffman, D. (2004). The civilian target in sierra leone and liberia: political power, military strategy, and humanitarian intervention. *African Affairs 103*(411), 211–226.

Horner, M. and R. Powell (1990). Internal structure of home ranges of black bears and analyses of home-range overlap. *Journal of Mammalogy 71*, 402–410.

Horowitz, D. L. (1985). *Ethnic Groups in Conflict*. Political science. Sociology: Area Studies. Berkeley, CA: University of California Press.

Hsiang, S. M., M. Burke, and E. Miguel (2013). Quantifying the influence of climate on human conflict. *Science 341*(6151).

Hultman, L. (2007). Battle losses and rebel violence: Raising the cost of fighting. *Terrorism and Political Violence 19*(2), 205–222.

Hultman, L. (2009). The power to hurt in civil war: The strategic aim of renamo violence. *Journal of Southern African Studies 35*(4).

Hultman, L. (2012). Attacks on civilians in civil war: Targeting the achilles heel of democratic governments. *International Interactions 38*(1), 164–181.

Hultman, L., J. D. Kathman, and M. Shannon (2013). United nations peacekeeping and civilian protection in civil war. *American Journal of Political Science 57*(4), 875–891.

Humphreys, M. (2005). Natural resources, conflict, and conflict resolution: Uncovering the mechanisms. *Journal of Conflict Resolution 49*(4), 508–537.

Iqbal, Z. (2006). Health and Human Security: The Public Health Impact of Violent Conflict. *International Studies Quarterly 50*(3), 631–649.

Iqbal, Z. (2010). *War and the Health of Nations*. Stanford, CA: Stanford University Press.

Kalyvas, S. (2006). *The Logic of Violence in Civil War*. New York, NY: Cambridge University Press.

Kalyvas, S. N. (2004). The paradox of terrorism in civil war. *The Journal of Ethics 8*(1), 97–138.

Kalyvas, S. N. (2008). The New U.S. Army/Marine Corps Counterinsurgency Field Manual. *Perspectives on Politics 6*(2), 351–353.

Kalyvas, S. N. and M. Kocher (2009). The dynamics of violence in vietnam: An analysis of the hamlet evaluation system. *Journal of Peace Research 46*(3), 335–355.

Kanbur, R., P. K. Rajaram, and A. Varshney (2011). Ethnic diversity and ethnic strife: And interdisciplinary perspective. *World Development 39*(2), 147–158.

Killicoat, P. (2007). *Weaponomics: The Global Market for Assault Rifles*, Volume 4202. World Bank Publications.

Koubi, V. (2005). War and Economic Performance. *Journal of Peace Research 42*(1), 67–82.

Krebs, J. and N. Davies (1997). *Behavorial Ecology: An Evolutionary Approach* (4 ed.). Oxford, UK: Blackwell Publishing.

Lacina, B. and N. P. Gleditsch (2005). Monitoring Trends in Global Combat: A New Dataset of Battle Deaths. *European Journal of Population 21*(2-3), 145–166.

Lake, D. A. (2002). Rational extremism: Understanding terrorism in the twenty-first century. *Dialogue IO*, 15–29.

Lasley, T. and C. L. Thyne (2014). Secession, legitimacy, and the use of child soldiers. *Conflict Management and Peace Science*.

Le Billon, P. (2001). The political ecology of war: natural resources and armed conflicts. *Political Geography 20*(5), 561–584.

Lichbach, M. I. (1987). Deterrence or escalation?: The puzzle of aggregate studies of repression and dissent. *Journal of Conflict Resolution 31*, 266–297.

Linke, A., F. D. Witmer, and J. O'Loughlin (2012). Space-time granger analysis of the war in iraq: A study of coalition and insurgent action-reaction. *International Interactions 38*(4), 402–425.

Lujala, P. (2010). The spoils of nature: Armed civil conflict and rebel access to natural resources. *Journal of Peace Research 47*(1), 15–28.

Mampilly, Z. C. (2011). *Rebel Rulers: Insurgent Governance and Civilian Life during War*. Ithaca, NY: Cornell University Press.

Marten, K. (2006). Warlordism in Comparative Perspective. *International Security 31*(3), 41–73.

Mason, D. (1996). Insurgency, counterinsurgency, and the rational peasant. *Public Choice 86*(1), 63–83.

Mason, T. D. and D. A. Krane (1989). The Political Economy of Death Squads. *International Studies Quarterly 33*(2), 175–198.

Maystadt, J.-F. and O. Ecker (2014). Extreme weather and civil war: Does drought fuel conflict in somalia through livestock price shocks? *American Journal of Agricultural Economics 96*(4), 1157–1182.

McCauley, J. F. (2013). Economic development strategies and communal violence in africa: The cases of cote d'ivoire and ghana. *Comparative Political Studies 46*(2), 182–211.

Metelits, C. (2009). *Inside Insurgency: Violence, Civilians, and Revolutionary Group Behavior*. New York, NY: NYU Press.

Midlarsky, M. (2005). *The Killing Trap*. Cambridge: Cambridge University Press.

Migdal, J. (1974). *Peasants, Politics, and Revolutions*. Princeton, NJ: Princeton University Press.

Mitchell, M., J. Zimmerman, and R. Powell (2002). Test of a habitat suitability index for black bears. *Wildlife Society Bulletin 30*, 794–808.

Mitchell, S. M. and C. G. Thies (2012). Resource curse in reverse: How civil wars influence natural resource production. *International Interactions 38*(2), 218–242.

Moore, B. (1966). *Social Origins of Dictatorship and Democracy*. Boston, MA: Beacon Press.

Moore, W. H. (2000). The Repression of Dissent: A Substitution Model of Government Coercion. *Journal of Conflict Resolution 44*(1), 107–127.

Mueller, J. (2004). *The Remnants of War*. Ithaca, NY: Cornell University Press.

Murray, C., G. King, A. D. Lopez, N. Tomijima, and E. G. Krug (2002). Armed Conflict as a Public Health Problem. *British Medical Journal 324*(7333), 346–349.

O'Loughlin, J., F. D. Witmer, A. Linke, A. Laing, A. Gettelman, and J. Dudhia (2012). Climate variability and conflict risk in east africa, 1990-2009. *Proceedings of the National Academy of Sciences 109*(45), 18344–18349.

Ostby, G., R. Nordas, and J. K. Rod (2009). Regional inequalities and civil conflict in sub-saharan africa. *International Studies Quarterly 53*(2), 301–324.

Petersen, R. D. (2002). *Understanding Ethnic Violence: Fear, Hatred, and Resentment in Twentieth-Century Eastern Europe*. Cambridge: Cambridge University Press.

Powell, R. A. and M. S. Mitchell (2012). What is a home range? *Journal of Mammalogy 93*(4), 948–958.

Powers, M., B. W. Reeder, and A. A. Townsen (2015). Hot spot peacekeeping. *International Studies Review 17*(1), 46–66.

Rabasa, A., S. Boraz, P. Chalk, K. Cragin, T. Karasik, J. Moroney, K. O'Brien, and J. Peters (2007). Ungoverned Territories: Understanding and Reducing Terrorism Risks. Technical report, RAND Corporation, Santa Monica, CA.

Raleigh, C. (2012). Violence against civilians: A disaggregated analysis. *International Interactions 38*, 462–481.

Raleigh, C. and D. Kniveton (2012). Come rain or shine: An analysis of conflict and climate variability in east africa. *Journal of Peace Research 49*(1), 51–64.

Ramankutty, N. and J. Foley (1999). Estimating historical changes in global land cover: Croplands from 1700-1992. *Global Biogeochemical Cycles 13*(4), 997–1027.

Reeder, B. W. (2014, October-December). Civil war and the severity of militarized interstate disputes. *Research and Politics 1*(3), 1–8.

Reeder, B. W. (2015). Rebel behavior in the context of interstate competition: Exploring day-to-day patterns of political violence in africa. *International Interactions*.

Reeder, B. W. and M. R. Reeder (2014). Political violence, interstate rivalry, and the diffusion of public health crises. *Social Science Quarterly 95*(4), 1101–1120.

Regan, P. M. and E. A. Henderson (2002). Democracy, Threats, and Political Repression in Developing Countries: Are Democracies Internally less Violent? *Third World Quarterly 23*(1), 119–136.

Reno, W. (1998). *Warlord Politics and African States*. Boulder, CO: Lynner Rienner Publishers.

Roberts, M. (2009). *Confrontations in Sri Lanka: Sinhalese, LTTE, and Others*. Colombo, Sri Lanka: Vijitha Yapa Publications.

Rone, J. (1994). *Civilian Devastation: Abuses by All Parties in the War in Southern Sudan*. New York, NY: Human Rights Watch.

Ross, M. L. (2004). What do we know about natural resources and civil war? *Journal of Peace Research 41*(3), 337–356.

Ryan, S., C. Knechtel, and W. Getz (2006). Range and habitat selection of african buffalo in south africa. *Journal of Wildlife Management 70*, 764–776.

Salehyan, I. (2008). No Shelter Here: Rebel Sanctuaries and International Conflict. *Journal of Politics 70*(1), 54–66.

Salehyan, I. (2009). *Rebels Without Borders: Transnational Insurgencies in World Politics*. Ithaca, NY: Cornell University Press.

Salehyan, I. (2010). The delegation of war to rebel organizations. *Journal of Conflict Resolution 54*(3), 493–515.

Salehyan, I. and K. S. Gleditsch (2006). Refugees and the Spread of Civil War. *International Organization 60*(4), 335–366.

Salehyan, I., K. S. Gleditsch, and D. E. Cunningham (2011). Explaining External Support for Insurgent Groups. *International Organization 65*(4), 709–744.

Salverda, N. (2013). Blue helmets as targets: A quantitative analysis of rebel violence against peacekeepers, 1989-2013. *Journal of Peace Research 50*(6), 707–720.

Sambanis, N. (2001). Do Ethnic and Non-Ethnic Civil Wars Have the Same Causes? *Journal of Conflict Resolution 45*(3), 259–282.

Samset, I. (2002). Conflict of interests or interests in conflict? diamonds and war in the drc. *Review of African Political Economy 93*, 463–480.

Sanin, F. G. (2004). Criminal rebels?: A discussion of civil war and criminality from the colombian experience. *Politics Society 32*(2), 257–285.

Schultz, K. A. (2010). The Enforcement Problem in Coercive Bargaining: Interstate Conflict over Rebel Support in Civil Wars. *International Organization 64*, 281–312.

Schutte, S. and N. Weidmann (2011). Diffusion patterns of violence in civil wars. *Political Geography 30*, 143–152.

Scott, A., D. Clark, R. B. Ehrnman, J. W. Salmon, H. B. Shill, and F. W. Trapnell (1970). *Insurgency*. Chapel Hill, NC: University of North Carolina Press.

Scott, J. C. (1976). *The Moral Economy of the Peasant: Rebellion and Subsistence in Southeast Asia*. New Haven, CT: Yale University Press.

Scott, J. C. (1999). *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. New Haven, CT: Yale University Press.

Senese, P. D. and J. A. Vasquez (2003). A Unified Explanation of Territorial Conflict: Testing the Impact of Sampling Bias, 1919-1992. *International Studies Quarterly 47*(2), 275–298.

Seton, E. (1909). *Life-histories of northern animals. An account of the mammals of Manitoba.* New York, NY: Charles Scribner's Sons.

Sexton, J.O., X. S. M. F. P. N. A. A. C. H. D. K. K. C. S. C. C. D. and J. Townshend (2013). Global, 30-m resolution continous fields of tree cover: Landsat-based rescaling of modis vegetation continuous fields with lidar-based estimates of error. *International Journal of Digital Earth*.

Silverman, B. (1986). *Density estimation for statistics and data analysis*. London: Chapman and Hall.

Small, C., F. P. and C. Elvidge (2005). Spatial analysis of global urban extent from dmsp-ols nighttime lights. *Remote Sensing of Environment 96*, 277–291.

Smith, C. (1999). South asia's enduring war. In R. I. Rotberg (Ed.), *Creating Peace in Sri Lanka: Civil War and Reconciliation*. Washington, DC: Brookings Instiution Press and World Peace Foundation.

Stanislawski, B. (2008). Para-States, Quasi-States, and Black Spots: Perhaps Not States, but Not 'Ungoverned Territories' Either. *International Studies Review 10*(2), 366–396.

Subramaniam, N. (2000, November). Tamil diaspora for nothing less than eelam? *The Hindu*.

Sundberg, R. and E. Melander (2013). Introducing the ucdp georeferenced event dataset. *Journal of Peace Research 50*(4), 523–532.

Swamy, M. N. (2002). *Tigers of Lanka*. New Delhi: Konark Publishers.

Taliaferro, J. W. (2006). State Building for Future Wars: Neoclassical Realism and the Resource-Extractive State. *Security Studies 15*(3), 464–495.

Tilly, C. (1975). Reflections on the history of european state making. In C. Tilly (Ed.), *The Formation of National States in Western Europe*. Princeton, NJ: Princeton University Press.

Toft, M. (2005). *The Geography of Ethnic Violence: Identity, Interests, and the Indivisiblity of Territory*. Princeton, NJ: Princeton University Press.

Townsen, A. A. and B. W. Reeder (2014). Where do peacekeepers go when they go? explaining the spatial heterogeneity of peacekeeping deployments. *Journal of International Peacekeeping 18*(1-2), 69–91.

Valentino, B. (2014). Why we kill: The political science of political violence against civilians. *Annual Review of Political Science 17*, 89–103.

Vinci, A. (2008, June). Anarchy, Failed States, and Armed Groups: Reconsidering Conventional Analysis. *International Studies Quarterly 52*(2), 295–314.

Waltz, K. N. (1979). *Theory of International Politics*. McGraw-Hill Publishers.

Wand, M. and M. Jones (1995). *Kernel Smoothing*. London: Chapman and Hall/CRC.

Weinstein, J. M. (2005). Resources and the information problem in rebel recruitment. *Journal of Conflict Resolution 49*(4), 598–624.

Weinstein, J. M. (2007). *Inside Rebellion: The Politics of Insurgent Violence*, Volume 113 of *Cambridge studies in comparative politics*. Cambridge, UK: Cambridge University Press.

Wood, R. M. (2010). Rebel capability and strategic violence against civilians. *Journal of Peace Research 47*(5), 601–614.

Wood, R. M. (2013). Opportunities to kill or incentives for restraint? rebel capabilities, the origins of support, and civilian victimization in civil war. *Conflict Management and Peace Science*, 1–20.

Wood, R. M. and J. D. Kathman (2014). Too much of a bad thing? civilian victimization and bargaining in civil war. *British Journal of Political Science 44*(3), 685–706.

Woods, D. (2003). The tragedy of the cocoa pod: rent-seeking, land and ethnic conflict in ivory coast. *Journal of Modern African Studies 41*(4), 641–655.

Worton, B. (1989). Kernel methods for estimating the utilization distribution in home-range studies. *Ecology 70*, 164–168.

Wright, T. M. (2014). Territorial revision and state repression. *Journal of Peace Research 51*(3), 375–387.