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RPPR Final Report

as of 29-Aug-2018

Agency Code:

Proposal Number: 64440LSMRI

Agreement Number: W911NF-13-1-0332

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Report Date: 30-Aug-2018

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Final Report for Period Beginning 15-Aug-2013 and Ending 30-May-2018

Title: Natural Resources and Armed Conflict

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Report Term: 0-Other

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STEM Degrees: 1

STEM Participants: 4

Major Goals: Research Aim

Develop theory, data, and tools to understand how armed actors' resource bases influence their political, strategic, and military choices during civil conflicts.

Research Problem

What explains the choice of strategies of violence by civil war combatants and outside actors? Governments and rebel groups, as well as their external supporters, can pursue their wartime goals with a range of violent strategies. This project improves understanding how the resource bases of actors, including their access to natural resource wealth, involvement in criminal activities, and control of territory, influence the dynamics of violence during civil wars.

Approach

Combatants need resources—some combination of people, money, weapons, and territory—to sustain their activities. We on how variation in the source and scale of such resources influences the strategic choices and violent behavior of both rebel movements and the governments they oppose.

Existing research has hypothesized relationships between the exploitation of natural resources, transnational crime, and the control of territory, and the dynamics of civil wars. But theory and data limitations make it difficult to determine if these relationships are specific to particular conflicts or regions of the world, and if these three factors have distinct effects on combatants' choices and actions. For this reason, a key goal of our project is to develop new theory and test this with new data collected at the micro- and organizational levels.

We use this data to test novel explanations of how the political and economic activities that sustain rebel groups influences conflict dynamics. Existing work has implicitly assumed that different sources of income for rebel organizations have similar consequences. In contrast, we theorize that the social relationships between rebels and producers shapes the course of violence during armed conflicts. Non-state violent actors have little incentive to avoid mistreating civilians or to engage in negotiations when they directly coerce or extort producers, as is often the case in artisanal mining and the cultivation of illegal drugs. In other situations, however, armed groups must secure the cooperation of outsiders to generate income. For example, violent non-state actors that engage in illegal taxation or international smuggling must ensure that they do not throttle local economic activity. This should moderate their use of indiscriminate violence, make them more willing to provide local public goods, and reduce acts of terrorism that threaten current or future supporters. The social relationships between rebels and producers should also influence the strategic choices of governments; they may moderate their use of indiscriminate violence

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when rebels have weak relationships to the local population, for example, but resort to such violence when the rebels are able to threaten their sovereignty by controlling territory.

Accomplishments: Key findings include:

- Existing focus on either grievances or “greed” as the cause of the outbreak of ethnic civil conflicts. We develop a theory which holds that natural resources only increase the likelihood of civil conflict when powerful ethnic grievances are in place. Political exclusion and the presence of valuable natural resources interact with one another to substantially increase the likelihood of ethnic armed conflict (Asal et al., Journal of Conflict Resolution, 2015).
- Why do some rebel groups attack civilians and engage in terrorism? Research has suggested that rebels earning income from natural resources are less reliant on civilian support and target civilians with violence and terrorism. We introduce the Rebel Contraband Dataset that measures the extent to which rebels exploit natural resources or rely on criminal activities. Rebels who earn income from natural resource exploitation engage in more violence against civilians. This is the first systematic test of the relationship between rebel finance and treatment of the civilian population (Walsh et al., 2018, Journal of Peace Research).
- The Rebel Contraband Dataset also allows us to more accurately describe patterns in rebel reliance on natural resources and criminal activity to finance their activities. Roughly half of rebel groups rely on a wide range of natural resources and criminal activity to fund violence. The most common methods of rebel finance are extortion and smuggling (Conrad et al., 2018, Peace and Conflict).
- How rebels earn income also matters for conflict dynamics. Here our theoretical innovation is to distinguish between extortion and smuggling. These strategies of revenue extraction influence rebel relations with the civilian population, which in turn influences their strategies of violence. Conflicts involving rebels that smuggle last longer (Conrad et al., forthcoming, Journal of Conflict Resolution). Conversely, extortion of natural resources makes rebel groups more likely to engage in sexual violence (Whitaker, Walsh, and Conrad, forthcoming, Journal of Politics). Extortion also creates incentives for rebels to provide healthcare services to civilians to maintain the health of their coerced workforce (Conrad, Midwest Political Science Association, 2018). Funding from diaspora communities increases the duration of conflicts (Whitaker and Setliff, manuscript, 2017), while conflicts that involve rebel engagement in criminal activities leads to longer conflicts (Piazza and Piazza, Terrorism and Political Violence, 2017).
- Existing literature has focused on rebel’s deliberate killings of civilians as the only measured type of civilian victimization. We collect and analyze organizational-level data on rebel violation of a wide range of human rights. Many rebel groups never engage in measurable violations of human rights, but others engage in frequent and systematic torture, imprisonment, property confiscation, and sexual violence (Conrad et al., 2018, Peace and Conflict). Rebel movements that profit from natural resources are more likely to employ child soldiers, for example (Faulkner, van der Haer, and Whitaker, Network of European Peace Scientists, 2017).
- Natural resource wealth also influences government strategies of violence. Countries with oil wealth experience greater terrorism; Piazza (Public Choice, 2017) finds that this is because oil wealth leads governments to abuse human rights. Uzonyi, Walsh, and Whitaker (manuscript, 2017) find that governments restrain their use of indiscriminate violence when rebels earn income from natural resources as a way to win popular support during conflicts. Oil-rich states are more likely to intervene in civil wars, but less likely to do so with their own military forces. Oil wealth creates incentives for governments to “coup proof” their militaries, making them less effective at projecting power into civil conflicts elsewhere (Boyle, Piazza, and Walsh, International Studies Association, 2017).
- We turn from explaining the consequences of rebel finance to exploring its causes. Aronson, Huth, and Walsh (American Political Science Association, 2018) show that extortion drives a wedge between rebels and civilians by depriving non-combatants of income. Rebels pay this cost when they are weaker than the governments they oppose, lose other sources of income, suffer battlefield losses, or have opportunities to exploit a quick influx of funding (for example, to arm and train recruits).
- There is debate in the literature about whether the location and value of natural resource wealth increases conflict. Influential studies find that countries with more natural resource wealth are more likely to experience civil wars, for example. More recent work (including Asal et al., 2015, Journal of Conflict Resolution) has investigated whether regions within countries with natural resource wealth are vulnerable to conflict. Findings have been mixed. One reason for this is that many studies look only at individual countries or one or a few resources. Little work also considers how changes in the prices of natural resources, not merely their location, influences conflict. To address these limitations, we developed the Natural Resource Location Dataset. This data set includes geo-located information about 167 different types of natural resources in 84 developing countries. It also includes detailed information about the world, U.S., and local prices of resources and commodities. Findley et al. (American Political Science Association, 2018) use this greatly-expanded data source to estimate how the location and value of resource wealth influences the onset of conflict. We theorize that changes in local prices should be the largest driver of any relationship between resources and conflict in a location. However, local prices are not independent of

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world prices; supply and demand shocks elsewhere in the world influence world prices, which feed into local prices. To address this endogenous relationship, we use world and US prices to instrument for local prices. The key finding is that increases in the value of all natural resources in a location are associated with subsequent increases in conflict events.

- In a series of papers (Tao, et al., Transactions in GIS, 2016; Tao et al., American Political Science Association, 2017; Aronson et al., American Political Science Association, 2017, 2018), we develop a new, theoretically-informed measure of territorial control during civil wars. This allows us to measure, across an ordinal range, which actor controls locations as small as 5km grids for each day. We combine this data with new theory about how shifts in territorial control influence combatants' political and military strategies. We find that initial patterns of rebel violence shift over time. In areas that rebels are interested in conquering, their forces escalate the use of violence over time. However, in areas that are under secure rebel control, violence spikes initially, but then declines quickly. We theorize that these patterns are driven the interaction of rebels' military objectives of defeating government forces on the battlefield, and their interests in increasing support from civilians for their political objectives.

- In realizing these accomplishments, we developed new, open-source data and tools that will be of use to the scholarly and academic communities. These include the project website (<http://www.civilwardynamics.org>), the Rebel Contraband Dataset, the Resource Location Dataset, The Rebel Human Rights Dataset, and the data on territorial control described above. We also developed new software for automating the extraction of event characteristics and geo-locations from text (Halterman, Journal of Open Source Software, 2016; Halterman, Society for Political Methodology, 2018), a QGIS plug-in for calculating zones of territorial control, and the CIVET interface for human-assisted coding of variables from text.

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Training Opportunities: The project provided many training opportunities to graduate and undergraduate students; details on the number and identity of these students are provided elsewhere in this report. Graduate students in Government (University of Texas at Austin), Public Policy (UNC Charlotte), Geography (UNC Charlotte), and Political Science (University of Albany) have been engaged as research assistants. Specific skills these graduate students learned included systematic data coding and collection, managing teams of (mostly undergraduate) coders, data analysis skills (in ArcGIS, QGIS, Python, R, and Stata), and software development (in QGIS and Python).

The project has also employed dozens of undergraduate research assistants at UNC Charlotte, the University of Texas at Austin, and the University of Albany. These students acquired skills in data collection (emphasizing the importance of reliability and validity), statistical analysis, and team work. A number of these students have used data from the project to write Honors Theses. Two students entered PhD programs after graduation; multiple students have gone on to pursue graduate training in a variety of fields.

Co-PIs on the project co-authored research papers with graduate students and an undergraduate student. These include:

Paper Title: Financing Rebellion

Co-PI Authors: Conrad, Walsh, Whitaker

Graduate Student Co-Author: Kaitlin Hudak, Public Policy, University of North Carolina at Charlotte

Paper Title: Rebel Natural Resource Exploitation and the Duration of Civil Wars

Co-PI Authors: Conrad, Walsh, Whitaker

Graduate Student Co-Author: Kevin T. Greene, Political Science, University of Pittsburgh

Paper Title: Accounting for Rebellion: How Rebels Finance Their Violence

Co-PI Authors: Conrad, Walsh, Whitaker

Graduate Student Co-Author: Kevin T. Greene, Political Science, University of Pittsburgh

Paper Title: Rebel Human Rights Abuses During Civil Wars

Co-PI Authors: Conrad, Walsh, Whitaker

Graduate Student Co-Author: Samuel Wilmer, Political Science, Pennsylvania State University

Paper Title: Crime Pays

Co-PI Author: James A. Piazza

Graduate Student Co-Author: Scott Piazza, Political Science, Pennsylvania State University

Paper Title: Rebel Resource Extraction and Healthcare: Strategic Incentives for Social Service Provision Co-PI

Authors: Justin M. Conrad

Graduate Student Co-Author: Liana Reyes-Reardon, Rice University

Paper Title: Territorial Control and Violence Against Civilians in Civil Wars

Co-PI Authors: Thill, Walsh

Graduate Student Co-Author: Ran Tao, Geography, University of North Carolina at Charlotte

Paper Title: Territory, Battles, and Terrorism in Civil Wars: A Quantitative Analysis of Boko Haram in Nigeria Co-PI

Authors: Thill, Walsh

Graduate Student Co-Author: Ran Tao, Geography, University of North Carolina at Charlotte

Two graduate students also used support from the project to write papers without co-PI co-authors:

Graduate Student: Kevin Greene, Political Science, University of Pittsburgh Paper: Time to Lift the Curse?

Graduate Student: Andrew Halterman, Political Science, Massachusetts Institute of Technology Paper: Mordecai

Co-PIs also co-authored a paper with an undergraduate student:

Paper: Diaspora Support and Conflict Duration

Co-PI Author: Beth Elise Whitaker

Undergraduate Student: Isaac Setliff, Political Science, University of North Carolina at Charlotte

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Results Dissemination: In addition to peer-reviewed publications, presentations at scholarly meetings, invited talks at other universities, and participation in the Minerva Annual Meeting and Program Review, we have sought outreach activities beyond the academic community. These include:

- Summary of findings from the Rebel Contraband Dataset in the Newsletter of the Africa Research Initiative, National Intelligence University.
- Research briefs on natural resources and conflict in Africa (available at www.civilwardynamics.org)
- Multiple presentations to the Joint Foreign Affairs Officer Program Africa Course.
- Multiple presentations to the NAVAIR Global Perspectives Seminar, October 2014 and April 2015.
- Presentation at the Washington, DC office of Global Witness.
- Presentation to the DHS/START SMA Lecture Series.
- Presentation to the Minerva SMA Lecture Series on Africa.
- Presentation to the Geostrategic Intelligence Seminar: Conflict in Africa, Defense Intelligence Agency.
- Meeting with Bryan Price and Daniel Milton, Combating Terrorism Center, United States Military Academy.
- Presentation at the Defense Intelligence Agency
- Post on "Political Violence at a Glance" blog on territorial control
- Presentation to the Military Operations and Law Conference, United States Pacific Command
- Presentation to the Committee on Assessing the Minerva Research Initiative and the Contribution of Social Science to Addressing Security Concerns, The National Academies of Science, Engineering, and Medicine
- Presentation to the Empirical Studies of Conflict meeting, United States Institute of Peace, Washington
- Presentations to the Minerva SMA Speaker Series

Honors and Awards: Nothing to Report

Protocol Activity Status:

Technology Transfer: Nothing to Report

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International Travel:

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Project Contribution:

International Collaboration:

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International Travel:

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International Travel:

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Project Contribution:

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International Travel:

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International Travel:

National Academy Member: N

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International Travel:

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National Academy Member: N
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International Travel:

National Academy Member: N

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International Travel:

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Project Contribution:

International Collaboration:

International Travel:

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RPPR Final Report as of 29-Aug-2018

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Article Title: Political Exclusion, Oil, and Ethnic Armed Conflict

Authors: Victor Asal, Michael Findley, James A. Piazza, James Igoe Walsh

Keywords: Natural resources, armed conflict, oil, civil war

Abstract: Why do members of some ethnic groups rebel against the state? One approach holds that groups subject to exclusion from national politics engage in armed conflict. We theorize that the presence of resource wealth moderates the effect of political exclusion. Ethnic groups subject to exclusion whose settlement area includes oil wealth are more likely to experience the onset of armed conflict than groups experiencing exclusion alone. We depart from the convention of cross-national analysis to examine sub-national, geocoded units of analysis—ethnic group settlement areas—to better capture the impact of natural resource distribution. Using data on ethnic group political exclusion derived from the Ethnic Power Relations database and geocoded indicators of we conduct a series of logistic regression analyses for the years 1946 to 2005. We find that exclusion alone increase the likelihood of conflict, while the presence of oil wealth further raises the risk of war.

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Conference Name: International Studies Association	
Date Received: 06-Aug-2017	Conference Date: 16-Mar-2016
Conference Location: Atlanta	
Paper Title: Oil and Terrorism	
Authors: James Piazza	
Acknowledged Federal Support: Y	

Publication Type: Conference Paper or Presentation	Publication Status: 1-Published
Conference Name: International Studies Association	
Date Received: 09-Aug-2017	Conference Date: 16-Mar-2016
Conference Location: Atlanta	
Paper Title: Oil Wealth and Civil War Intervention	
Authors: Emma Leonard Boyle, James Piazza, James Igoe Walsh	
Acknowledged Federal Support: Y	

Publication Type: Conference Paper or Presentation	Publication Status: 0-Other
Conference Name: American Political Science Association	
Date Received: 27-Aug-2016	Conference Date: 03-Sep-2016
Conference Location: Philadelphia	
Paper Title: Territorial Control and Violence Against Civilians in Civil Wars	
Authors: Michael Findley, Daniel Strandow, Jean-Claude Thill, James Igoe Walsh	
Acknowledged Federal Support: Y	

Publication Type: Conference Paper or Presentation	Publication Status: 0-Other
Conference Name: American Political Science Association	
Date Received: 27-Aug-2016	Conference Date: 02-Sep-2016
Conference Location: Philadelphia	
Paper Title: Rebel Natural Resource Exploitation and the Duration of Civil Wars	
Authors: Justin Conrad, Kevin Greene, Beth Elise Whitaker, James Igoe Walsh	
Acknowledged Federal Support: Y	

Publication Type: Conference Paper or Presentation	Publication Status: 0-Other
Conference Name: Midwest Political Science Association	
Date Received: 06-Aug-2017	Conference Date: 15-Apr-2016
Conference Location: Chicago	
Paper Title: The Local Resource Curse	
Authors: Andrew Stravers, Michael Findley	
Acknowledged Federal Support: Y	

Publication Type: Conference Paper or Presentation	Publication Status: 0-Other
Conference Name: Midwest Political Science Association	
Date Received: 06-Aug-2017	Conference Date: 07-Apr-2017
Conference Location: Chicago	
Paper Title: Time to Lift the Curse? Reexamining the Effect of Natural Resources on Civilian Victimization	
Authors: Caleb Lucas, Kevin Greene, Thomas Bentley	
Acknowledged Federal Support: Y	

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Publication Type: Conference Paper or Presentation **Publication Status:** 0-Other
Conference Name: European Peace Science Conference
Date Received: 09-Aug-2017 Conference Date: 27-Jun-2017 Date Published:
Conference Location: Antwerp
Paper Title: Rebel Funding and Child Soldiers: Exploring the relationship between endowments and forcible recruitment
Authors: Christopher Faulkner, Roos van der Haer, Beth Elise Whitaker
Acknowledged Federal Support: **Y**

Publication Type: Conference Paper or Presentation **Publication Status:** 0-Other
Conference Name: International Studies Association
Date Received: 09-Aug-2017 Conference Date: 17-Feb-2017 Date Published:
Conference Location: Baltimore
Paper Title: Diaspora Support and Conflict Duration
Authors: Isaac Setliff, Beth Elise Whitaker
Acknowledged Federal Support: **Y**

Publication Type: Conference Paper or Presentation **Publication Status:** 0-Other
Conference Name: Annual meeting of the American Political Science Association
Date Received: 27-Aug-2017 Conference Date: 30-Aug-2017 Date Published:
Conference Location: San Francisco
Paper Title: Territorial Control and Violence Against Civilians: Boko Haram in Nigria
Authors: Aronson Jacob, Tao Ran, Thill Jean-Claude, Walsh James
Acknowledged Federal Support: **Y**

Publication Type: Conference Paper or Presentation **Publication Status:** 0-Other
Conference Name: Annual meeting of the American Political Science Association
Date Received: 21-Apr-2018 Conference Date: 30-Aug-2017 Date Published:
Conference Location: San Francisco
Paper Title: Territorial Control and Violence Against Civilians: Boko Haram in Nigeria
Authors: Aronson Jacob, Tao Ran, Thill Jean-Claude, Walsh James
Acknowledged Federal Support: **Y**

Publication Type: Conference Paper or Presentation **Publication Status:** 0-Other
Conference Name: International Studies Association
Date Received: 21-Apr-2018 Conference Date: 07-Apr-2018 Date Published:
Conference Location: San Francisco
Paper Title: Soft Money Insurgency: The Determinants of Rebel Funding Strategies
Authors: Aronson Jacob, Walsh James, Huth Paul
Acknowledged Federal Support: **Y**

Publication Type: Conference Paper or Presentation **Publication Status:** 0-Other
Conference Name: Annual Meeting of the Society for Political Methodology
Date Received: 12-Aug-2018 Conference Date: 18-Jul-2018 Date Published:
Conference Location: Provo, Utah
Paper Title: Linking Events and Locations in Text
Authors: Andy Halterman
Acknowledged Federal Support: **Y**

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Publication Type: Conference Paper or Presentation **Publication Status:** 0-Other
Conference Name: American Political Science Association
Date Received: 27-Aug-2018 Conference Date: 31-Aug-2018 Date Published: 31-Aug-2018
Conference Location: Boston
Paper Title: Natural Resources and Civil Conflict: Evidence from a New Georeferenced Dataset
Authors: Michael Denly, Michael Findley, Andrew Stravers, James Igoe Walsh
Acknowledged Federal Support: **Y**

Publication Type: Conference Paper or Presentation **Publication Status:** 0-Other
Conference Name: American Political Science Association (APSA)
Date Received: 28-Aug-2018 Conference Date: 31-Aug-2018 Date Published: 31-Aug-2018
Conference Location: Boston
Paper Title: Control, Collaboration, and Rebel Violence Against Civilians
Authors: Jacob Aronson, Michael Findley, Kyosuke Kikuta, Ran Tao, Jean-Claude Thill, James Igoe Walsh
Acknowledged Federal Support: **Y**

Publication Type: Conference Paper or Presentation **Publication Status:** 0-Other
Conference Name: American Political Science Association annual meeting
Date Received: 28-Aug-2018 Conference Date: 31-Aug-2018 Date Published: 31-Aug-2018
Conference Location: Boston
Paper Title: Soft Money Insurgency: The Determinants of Rebel Funding Strategies
Authors: Jacob Aronson, Paul Huth, James Igoe Walsh
Acknowledged Federal Support: **Y**

WEBSITES:

URL: <http://www.civilwardynamics.org>
Date Received: 27-Aug-2016
Title: Resources and Conflict Project
Description: Website for Minerva project

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Natural Resources and Armed Conflict
Final Report
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31 August 2018

Major Goals

Research Aim

Develop theory, data, and tools to understand how armed actors' resource bases influence their political, strategic, and military choices during civil conflicts.

Research Problem

What explains the choice of strategies of violence by civil war combatants and outside actors? Governments and rebel groups, as well as their external supporters, can pursue their wartime goals with a range of violent strategies. This project improves understanding how the resource bases of actors, including their access to natural resource wealth, involvement in criminal activities, and control of territory, influence the dynamics of violence during civil wars.

Approach

Combatants need resources—some combination of people, money, weapons, and territory—to sustain their activities. We on how variation in the source and scale of such resources influences the strategic choices and violent behavior of both rebel movements and the governments they oppose.

Existing research has hypothesized relationships between the exploitation of natural resources, transnational crime, and the control of territory, and the dynamics of civil wars. But theory and data limitations make it difficult to determine if these relationships are specific to particular conflicts or regions of the world, and if these three factors have distinct effects on combatants' choices and actions. For this reason, a key goal of our project is to develop new theory and test this with new data collected at the micro- and organizational levels.

We use this data to test novel explanations of how the political and economic activities that sustain rebel groups influences conflict dynamics. Existing work has implicitly assumed that different sources of income for rebel organizations have similar consequences. In contrast, we theorize that the *social relationships* between rebels and producers shapes the course of violence during armed conflicts. Non-state violent actors have little incentive to avoid mistreating civilians or to engage in negotiations when they directly coerce or extort producers, as is often the case in artisanal mining and the cultivation of illegal drugs. In other situations, however, armed groups must secure the cooperation of outsiders to generate income. For example, violent non-state actors that engage in illegal taxation or international smuggling must ensure that they do not throttle local economic activity. This should moderate their use of indiscriminate violence, make them more willing to provide local public goods, and reduce acts of terrorism

that threaten current or future supporters. The social relationships between rebels and producers should also influence the strategic choices of governments; they may moderate their use of indiscriminate violence when rebels have weak relationships to the local population, for example, but resort to such violence when the rebels are able to threaten their sovereignty by controlling territory.

Accomplished Goals

Key findings from the project include:

- Existing focus on either grievances or “greed” as the primary cause of the outbreak of ethnic civil conflicts. We develop a theory which holds that grievances are the key drivers of civil conflict, and that natural resources only increase the likelihood of civil conflict when powerful ethnic grievances are in place. We find that political exclusion and the presence of valuable natural resources interact with one another to substantially increase the likelihood of ethnic armed conflict (Asal et al., *Journal of Conflict Resolution*, 2015).
- Why do some rebel groups attack civilians and engage in terrorism, while others do not? One powerful explanation points to the sources of rebel finance. Research has suggested that rebels earning income from natural resources are less reliant on civilian support and target civilians with violence and terrorism. We introduce the Rebel Contraband Dataset that measures the extent to which rebels exploit natural resources or rely on criminal activities. Rebels who earn income from natural resource exploitation engage in more violence against civilians. This is the first systematic test of the relationship between rebel finance and treatment of the civilian population (Walsh et al., 2018, *Journal of Peace Research*).
- The Rebel Contraband Dataset also allows us to more accurately describe patterns in rebel reliance on natural resources and criminal activity to finance their activities. Roughly half of rebel groups rely on a wide range of natural resources and criminal activity to fund violence. The most common methods of rebel finance are extortion and smuggling (Conrad et al., 2018, *Peace and Conflict*).
- How rebels earn income also matters for conflict dynamics. Here our theoretical innovation is to distinguish between extortion and smuggling. We hypothesize that these strategies of revenue extraction influence rebel relations with the civilian population, which in turn influences their strategies of violence. Conflicts involving rebels that smuggle last longer than those in which they extort or earn no income from natural resources (Conrad et al., forthcoming, *Journal of Conflict Resolution*). Conversely, extortion of natural resources makes rebel groups more likely to engage in sexual violence (Whitaker, Walsh, and Conrad, forthcoming, *Journal of Politics*). Extortion also creates incentives for rebels to provide healthcare services to civilians to maintain the health of their coerced workforce (Conrad, Midwest Political Science Association, 2018). Funding from diaspora communities also increases the duration of conflicts (Whitaker

and Setliff, manuscript, 2017), while conflicts that involve rebel engagement in criminal activities leads to longer conflicts (Piazza and Piazza, *Terrorism and Political Violence*, 2017).

- Existing literature has focused on rebel's deliberate killings of civilians as the only measured type of civilian victimization. We collect and analyze organizational-level data on rebel violation of a wide range of human rights. Many rebel groups never engage in measurable violations of human rights, but others engage in frequent and systematic torture, imprisonment, property confiscation, and sexual violence (Conrad et al., 2018, *Peace and Conflict*). Rebel movements that profit from natural resources are more likely to employ child soldiers, for example (Faulkner, van der Haer, and Whitaker, Network of European Peace Scientists, 2017).
- Natural resource wealth also influences government strategies of violence. Countries with oil wealth experience greater terrorism; Piazza (*Public Choice*, 2017) finds that this is because oil wealth leads governments to abuse human rights, which in turn creates grievances and opportunities that facilitate terrorism. Uzonyi, Walsh, and Whitaker (manuscript, 2017) find that governments restrain their use of indiscriminate violence when rebels earn income from natural resources as a way to win popular support during conflicts. Oil-rich states are more likely to intervene in civil wars, but less likely to do so with their own military forces. Oil wealth creates incentives for governments to "coup proof" their militaries, making them less effective at projecting power into civil conflicts elsewhere (Boyle, Piazza, and Walsh, International Studies Association, 2017).
- In more recent work, we turn from explaining the consequences of rebel finance to exploring its causes. Aronson, Huth, and Walsh (American Political Science Association, 2018) show that extortion drives a wedge between rebels and civilians by depriving non-combatants of income. Rebels pay this cost when they are weaker than the governments they oppose, lose other sources of income, suffer battlefield losses, or have opportunities to exploit a quick influx of funding (for example, to arm and train recruits).
- There is considerable debate in the literature about whether the location and value of natural resource wealth increases the likelihood and intensity of conflict. A number of influential studies have found that countries with more natural resource wealth are more likely to experience civil wars, for example. More recent work (including Asal et al., 2015, *Journal of Conflict Resolution*) has investigated whether regions within countries with natural resource wealth are vulnerable to conflict. Findings have been mixed. One reason for this is that many studies look only at individual countries or one or a few resources such as oil or minerals. Little work also considers how changes in the prices of natural resources, not merely their location, influences conflict. To address these limitations, we developed the Natural Resource Location Dataset. This data set includes geo-located information about 167 different types of natural resources in 84 developing countries. It also includes detailed information about the world, U.S., and local prices of

resources and commodities. Findley et al. (American Political Science Association, 2018) use this greatly-expanded data source to estimate how the location and value of resource wealth influences the onset of conflict. We theorize that changes in local prices should be the largest driver of any relationship between resources and conflict in a location. However, local prices are not independent of world prices; supply and demand shocks elsewhere in the world influence world prices, which feed into local prices. To address this endogenous relationship, we use world and US prices to instrument for local prices. The key finding is that increases in the value of all natural resources in a location are associated with subsequent increases in conflict events.

- In a series of papers (Tao, et al., *Transactions in GIS*, 2016; Tao et al., American Political Science Association, 2017; Aronson et al., American Political Science Association, 2017, 2018), we develop a new, theoretically-informed measure of territorial control by governments and rebel groups during civil wars. This allows us to measure, across an ordinal range, which actor controls locations as small as 5km grids for each day during a conflict. We combine this data with new theory about how shifts in territorial control influence combatants' political and military strategies. For example, we find that rebels moving into an area with a weak state presence engage in more terrorism and violence against civilians to coerce civilians into not cooperating with government forces. We also find that initial patterns of rebel violence shift over time. In areas that rebels are interested in conquering, their forces escalate the use of violence over time. However, in areas that are under secure rebel control, violence spikes initially, but then declines quickly. We theorize that these patterns are driven the interaction of rebels' military objectives of defeating government forces on the battlefield, and their interests in increasing support from civilians for their political objectives.
- In realizing these accomplishments, we developed new, open-source data and tools that will be of use to the scholarly and academic communities. These include the project website (<http://www.civilwardynamics.org>), the Rebel Contraband Dataset, the Resource Location Dataset, The Rebel Human Rights Dataset, and the data on territorial control described above. We also developed new software for automating the extraction of event characteristics and geo-locations from text (Halterman, *Journal of Open Source Software*, 2016; Halterman, Society for Political Methodology, 2018), a QGIS plug-in for calculating zones of territorial control, and the CIVET interface for human-assisted coding of variables from text.

While funding for this project has ended, we plan to continue to build on these accomplishments. Team members have a number of working papers that are currently under review at peer-review journals, or will be submitted shortly. We also plan to explore opportunities to seek funding to extend the datasets described above.

Training Opportunities

The project provided many training opportunities to graduate and undergraduate students; details on the number and identity of these students are provided elsewhere in this report. Graduate students in Government (University of Texas at Austin), Public Policy (UNC Charlotte), Geography (UNC Charlotte), and Political Science (University of Albany) have been engaged as research assistants. Specific skills these graduate students learned included systematic data coding and collection, managing teams of (mostly undergraduate) coders, data analysis skills (in ArcGIS, QGIS, Python, R, and Stata), and software development (in QGIS and Python). The project has also employed dozens of undergraduate research assistants at UNC Charlotte, the University of Texas at Austin, and the University of Albany. These students acquired skills in data collection (emphasizing the importance of reliability and validity), statistical analysis, and team work. A number of these students have used data from the project to write Honors Theses. Two students entered PhD programs after graduation; multiple students have gone on to pursue graduate training in a variety of fields.

Co-PIs on the project co-authored research papers with graduate students and an undergraduate student. These include:

Paper Title: Financing Rebellion

Co-PI Authors: Conrad, Walsh, Whitaker

Graduate Student Co-Author: Kaitlin Hudak, Public Policy, University of North Carolina at Charlotte

Paper Title: Rebel Natural Resource Exploitation and the Duration of Civil Wars

Co-PI Authors: Conrad, Walsh, Whitaker

Graduate Student Co-Author: Kevin T. Greene, Political Science, University of Pittsburgh

Paper Title: Accounting for Rebellion: How Rebels Finance Their Violence

Co-PI Authors: Conrad, Walsh, Whitaker

Graduate Student Co-Author: Kevin T. Greene, Political Science, University of Pittsburgh

Paper Title: Rebel Human Rights Abuses During Civil Wars

Co-PI Authors: Conrad, Walsh, Whitaker

Graduate Student Co-Author: Samuel Wilmer, Political Science, Pennsylvania State University

Paper Title: Crime Pays

Co-PI Author: James A. Piazza

Graduate Student Co-Author: Scott Piazza, Political Science, Pennsylvania State University

Paper Title: Rebel Resource Extraction and Healthcare: Strategic Incentives for Social Service Provision
Co-PI Authors: Justin M. Conrad

Graduate Student Co-Author: Liana Reyes-Reardon, Rice University

Paper Title: Territorial Control and Violence Against Civilians in Civil Wars

Co-PI Authors: Thill, Walsh

Graduate Student Co-Author: Ran Tao, Geography, University of North Carolina at Charlotte

Paper Title: Territory, Battles, and Terrorism in Civil Wars: A Quantitative Analysis of Boko Haram in Nigeria
Co-PI Authors: Thill, Walsh

Graduate Student Co-Author: Ran Tao, Geography, University of North Carolina at Charlotte

Two graduate students also used support from the project to write papers without co-PI co-authors:

Graduate Student: Kevin Greene, Political Science, University of Pittsburgh
Paper: Time to Lift the Curse?

Graduate Student: Andrew Halterman, Political Science, Massachusetts Institute of Technology
Paper: Mordecai

Co-PIs also co-authored a paper with an undergraduate student:

Paper: Diaspora Support and Conflict Duration

Co-PI Author: Beth Elise Whitaker

Undergraduate Student: Isaac Setliff, Political Science, University of North Carolina at Charlotte

Dissemination

In addition to peer-reviewed publications, presentations at scholarly meetings, invited talks at other universities, and participation in the Minerva Annual Meeting and Program Review, we have sought outreach activities beyond the academic community. These include:

- Summary of findings from the Rebel Contraband Dataset in the Newsletter of the Africa Research Initiative, National Intelligence University.
- Research briefs on natural resources and conflict in Africa (available at www.civilwardynamics.org)
- Multiple presentations to the Joint Foreign Affairs Officer Program Africa Course.
- Multiple presentations to the NAVAIR Global Perspectives Seminar, October 2014 and April 2015.
- Presentation at the Washington, DC office of Global Witness.
- Presentation to the DHS/START SMA Lecture Series.
- Presentation to the Minerva SMA Lecture Series on Africa.
- Presentation to the Geostrategic Intelligence Seminar: Conflict in Africa, Defense Intelligence Agency.
- Meeting with Bryan Price and Daniel Milton, Combating Terrorism Center, United States Military Academy.

- Presentation at the Defense Intelligence Agency
- Post on “Political Violence at a Glance” blog on territorial control
- Presentation to the Military Operations and Law Conference, United States Pacific Command
- Presentation to the Committee on Assessing the Minerva Research Initiative and the Contribution of Social Science to Addressing Security Concerns, The National Academies of Science, Engineering, and Medicine
- Presentation to the Empirical Studies of Conflict meeting, United States Institute of Peace, Washington
- Presentations to the Minerva SMA Speaker Series

Participants

Type	First Name	Last Name	Person-Months
PI	James	Walsh	3
Co-PI	Jean-Claude	Thill	2
Co-PI	Michael	Findley	3
Co-PI	James	Piazza	2
Co-PI	Victor	Asal	3
Other Professional	Philip	Schrodt	3
Other Professional	Daniel	Stradow	2
Other Professional	Kenneth	Cousins	1
High School Student	Jackson	Smith	1
Graduate Student	Andrew	Halterman	1
Graduate Student	Michelle	Haragos	2
Graduate Student	Katelin	Hudak	6
Graduate Student	Jessica	Hall	2
Graduate Student	Gavin	Iddings	2
Graduate Student	Ran	Tao	2
Graduate Student	Andrew	Stravers	3
Graduate Student	Ataurraheem	Chaudhry	1
Graduate Student	Tawheeda	Wahabzada	1
Graduate Student	Michael	Denly	2
Undergraduate Student	Madison	Bishop	1
Undergraduate Student	Emily	Young	1
Undergraduate Student	Raven	Longhorne	1
Undergraduate Student	Ashley	Huddleston	1
Undergraduate Student	Jordan	Woods	1
Undergraduate Student	Justin	Jones	1
Undergraduate Student	Kevin	Greene	1
Undergraduate Student	Koffi		1
Undergraduate Student	Sebastian	Feculak	1
Undergraduate Student	Michelle	Haragos	1
Undergraduate Student	Jason	Sanft	1
Undergraduate Student	Samuel	Wilmer	1
Undergraduate Student	Janelle	Day	1
Undergraduate Student	Emily	Grassett	1
Undergraduate Student	Andrea	Greer	1
Undergraduate Student	Daniel	Chapman	1
Undergraduate Student	Anna	Scanlon	1

Undergraduate Student	Louchi	Chi	1
Undergraduate Student	Alejandra	Gaytan	1
Undergraduate Student	Vishal	Duvvuru	1
Undergraduate Student	Amy	Leung	1
Undergraduate Student	Josh	Malett	1
Undergraduate Student	Josh	Hamlin	1
Undergraduate Student	Haley	Galloway	1
Undergraduate Student	Jennifer	Johnson	1
Undergraduate Student	Kolby	Vidrine	1
Undergraduate Student	Lily	Hayes	1
Undergraduate Student	Santiago	Vallejo	1
Undergraduate Student	Joyce	Jiang	1
Undergraduate Student	Gabby	Torres	1
Undergraduate Student	Matt	Tiritilli	1
Undergraduate Student	Yefan	Zhou	1