Predicting the Evolution of Intrastate Conflict: Evidence from Nigeria ☆

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Abstract

The endogenous nature of civil conflict has limited scholars' abilities to draw clear inferences about key drivers of conflict evolution. Using ACLED event data, we apply a new network-based approach to trace the evolution of intra-state conflict dynamics and test how the behavior of violent actors push armed groups closer together or further apart over time. For example, we examine whether violence against civilians isolates groups from one another, or increases the probability of violence between them. We then use this information to predict conflict in Nigeria using an out-of-sample design. We compare these predictions to those generated using a canonical generalized linear model of intrastate conflict.

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Introduction

Intrastate conflict is a dynamic, interdependent process typically spanning across vast regions and years, involving many political actors and costing thousands of lives. Although the study of intrastate conflict is strongly rooted in a dyadic state-versus-rebels paradigm, scholars are increasingly developing research programs to address the essential complexities of intrastate conflict. First, civil conflict almost always involves more than one influential non-state actor group–whether the conflict manifests as a traditional civil war scenario or as widespread criminal violence with dynamics of insurgency. For example, the Cuban Revolution, while largely seen as a successful rebellion led by Fidel Castro and Che Guevara was actually a successful movement drawn from the strength of multiple non-state actor groups allying against the government. In other regions, like Mexico, we observe drug trafficking organizations (DTOs) not only vying for political influence and territorial control against government against but also against other DTOs.

Sociologists have long established that to understand an actor's (or group's) behavior it is necessary to understand the context in which the actor operates as well as interpret their interactions with one partner in light of all interactions across all other partners. Conflict scholars are interested in questions that mirror these exact patterns, such as: which actor is driving the violence within a multi-actor conflict? Did a government crackdown cause anti-government coordination or chaos between armed groups? Are civilian challenges towards non-state armed actors causing an increase or decrease in violence? These questions precisely illuminate the need to apply the appropriate methodological approach to pressing questions in our field. We argue that conflict evolution is a process conditioned on the relative effects of actors' behavior and is thus best conceptualized via a network approach.

Our paper is the first to apply a network approach to the study of civil conflict evolution. Accordingly, we argue that our approach more accurately captures the endogenous evolution of civil conflict than previous efforts. A network framework for studying conflict evolution is not only more precise–capturing the inherently interdependent structure of conflict–but it enhances our ability to predict how a conflict will develop by taking into account the endogenous structures that develop over time between actors.

We turn to the Nigerian case. In doing so we consider two other key exogenous factors–civilian victimization and protest. We find.

How do Conflicts Evolve?

Rework this first half to argue civilians are left out, then build on final paragraph to write the second/latter half on frameworks that ignore interdependent nature of conflict

More often than not, stories of armed conflict, war, or widespread criminal violence shine a spotlight on those actors who initiate injustices or wield power through collective violence against a given population. Recently, however, this narrative has begun to change. With the various uprisings across the previous 5 years–the Tunisian revolution, the Egyptian revolution, the Syrian Civil War, the Yemen revolt, the 2013 protests in Turkey, and the 2014 protests in Venezuela (just to name a few)–attention has shifted to recognize the power of the population to influence environments of extreme violence and repression.

A diverse range of conflictual episodes occur around the world: coups, civil wars, drug wars, refugee crises, border disputes. While media attention might focus on civilians fleeing or to cooperating with whichever armed actor wields the greatest power in their region, a truer picture reveals a vast range of civilian responses to violence. Mass anti-regime movements are an important form of civilian response in some cases but

civilians might also engage at the local level through self-defense forces, community watch groups, civil society efforts, or nonviolent campaigns in their home town.

Compared to the number of studies focusing on economic (Collier and Hoeffler, 2004), political (**?**), and identity-based (**?**) drivers of conflict intensity and duration, existing research has largely neglected the role of civilians in restraining or influencing the behavior of armed actors. A large body of research has explored the origins of collective action and mobilization, (Gurr 1970; Opp 1988, Tarrow 1994, Tucker 2007) and recent scholarship has assessed the effectiveness of "maximalist campaigns" (**?**) to show that countries are more likely to be democratic following nonviolent campaigns. However, as articulated by Celestino and Gleditsch (2013) even the macro-level relationship between nonviolent campaigns and state-level outcomes such as democracy or regime transitions remains unclear. Importantly, Celestino and Gleditsch (2013) show that nonviolent campaigns destabilize regimes, but that the trajectory of peace and democracy following such campaigns is conditional on the precise actions employed by campaign organizers.

Building on the research agenda motivated by macro-level studies, we investigate the link between nonviolent action and violence at the local level. The focus of this study is two-fold. First we discuss the importance of considering conflict processes through a network framework. In doing so, we suggest that networks of conflict constitute a meaningful outcome of interest and depart from the great majority of the literature which focuses on dyadic outcomes to measure conflict intensity or duration. Second, we contribute to a growing scholarship concerned with whether or not people-power driven actions and campaigns influence trajectories of violence and stability.

Political Violence and Civilian Populations: An Inclusive Model of Conflict Evolution

Re-shape the first part to be about testing relationships between civilians and violence. The second half can talk more about expectations around endogenous factors.

There is little empirical evidence that protests should or should not “work" in contexts of high violence at the sub-state level. There are several possible logics linking protest and violence between armed groups.

First, there might be no relationship between protests and violence. Protest might have other benefits and thus persist for reasons outside of the stated goals driving protest organizers. For example, non-violent activism via protest can stimulate community between survivors of violence and foster a sense of purpose and belonging in the midst of crisis. Additionally, protests against insecurity and issues of violence might be targeted at both types of armed actors (i.e. the state and the non-state challenger), these actors could respond to protests through other means outside of violent strategy. Non-state armed groups might make public appeals to civilians, saying that they are there for civilians’ protection. Similarly, governments can respond with media campaigns, speeches, or through a general effort to try to divert political attention from violent events. A second mechanism driving a null relationship between protests and violent events is the high level of risk for protestors. Following a protest, participants might be targeted because of their activism, possibly resulting in fewer protests over time but with no clear consequences for violence between armed groups.

Second, protest participants might achieve their stated aims and decrease violent contestation in their region. If protests successfully demand that the government invest greater resources in the prevention of violence, then we would expect fewer incidents of violence following protests. If protests also demand that non-state actors

stop warfare with the state, this manifests as a public disapproval of attempts by the non-state group to coerce or control the civilian population. With enough discontent, protests disrupt the ability of non-state actors to operate in their region.

Finally, protest could lead to an increase in violence. As violence between armed actors (state and non-state) increases, non-state actors often victimize civilians to highlight the government's inability to protect the population. Even if protestors demand a non-violent solution to warfare, a final plausible logic connecting protest and violence is that protest raises the cost of government inaction so that government armed actors are more likely to visibly fight hard in the next round of contestation. This logic would suggest an antagonistic government actor, one who is politically motivated to demonstrate competency through violent policy.

The Conflict[s] in Nigeria

Brief summary of the 2000-2016 conflict period and the rise of bokoharam

ACLED Data

Creating a Conflict Network in Nigeria

Modelling Approach

To model and predict intra-state conflict in Nigeria, we rely on an Additive and Multiplicative Effects (AME) model. This is a model that can account for many of the interdependencies in relational data. The particular estimator is:

$$Y_{ijt} = g(\mathbf{X}_{\mathbf{ijt}}^{\mathbf{T}}\beta + a_i + b_j + \mathbf{u_i}\delta\mathbf{v_j} + \epsilon_{ijt}) \quad (1)$$

where Y_{ijt} represents the amount of conflict between actor i and actor j at time t. The additive part of the model is derived from **?**'s Social Relations Regression Model,

and is composed of the fixed effects $\mathbf{X}_{\mathbf{ijt}}^{\mathbf{T}}\beta$ which account for (potentially time varying) covariates in the model, as well as the sender and receiver effects a_i and b_j. The random effects account for one source of interdependency in relational data: the tendency for certain actors to be disproportionately involved in conflict. The stochastic error ϵ_{ijt} is defined as:

$$e_{ijt}\text{+}iid \sim N(0, \Sigma_\epsilon) \tag{2}$$

$$\Sigma_\epsilon = \sigma_\epsilon \begin{pmatrix} 1\rho \\ \rho 1 \end{pmatrix} \tag{3}$$

where ρ is a measure of reciprocity in the data. These factors allow us to take into account the similarity between ij interactions and ji interactions. However, while additive effects can deal with first (differing popularity and activity of actors) and second order interdependencies (reciprocity), the multiplicative effects are needed to deal with third order dependencies. Two third-order dependencies worth considering here are homophily – the tendency of actors with similar characteristics are more likely to form strong relationships than those with differing characteristics – and stochastic equivalence, the possibility that two actors i and j will have similar relationships with every other actor in the network. An AME model accounts for these third order effects using the multiplicative term $\mathbf{u_i}\delta\mathbf{v_j}$. This model posits a latent vector of characteristics $\mathbf{u_i}$ and $\mathbf{v_j}$ for each sender i and receiver j. The similarity or dissimilarity of these vectors will then influence the likelihood of activity, and therefore account for these third order interdepencies (**?**).

0.1. Latent Factors

An important thing to understand the latent factor model here is that it is different than a latent space model as traditionally used. Even though, in the models discussed,

the latent factor has two dimensions, and we can thus plot it, the Euclidian distance between the different actors is not easily interpretable. Rather that looking at distance, we should look at the direction of the factors for the actors. If we represent the latent factors as vectors, than actors who have these vectors in the same direction will exhibit more stochastic equivalence, and those with actors in opposite directions will exhibit little such equivalence. In other words, if the factors point in the same direction, we should expect to see the actors having similar types and amounts of interactions with similar third parties.

We can get a sense of the direction of these factors by placing each actor on a unit circle based on direction of this vector in comparison to the center of each actor's positions. Then, we can get a measure of this stochastic equivalence by comparing the difference in angles between these two actors. We do this in section **??** to examine the effect of violence against civilians on the shape of the latent group network.

Variables

Results

Parameter Estimates

Network Dependencies

Out of Sample Performance Analysis

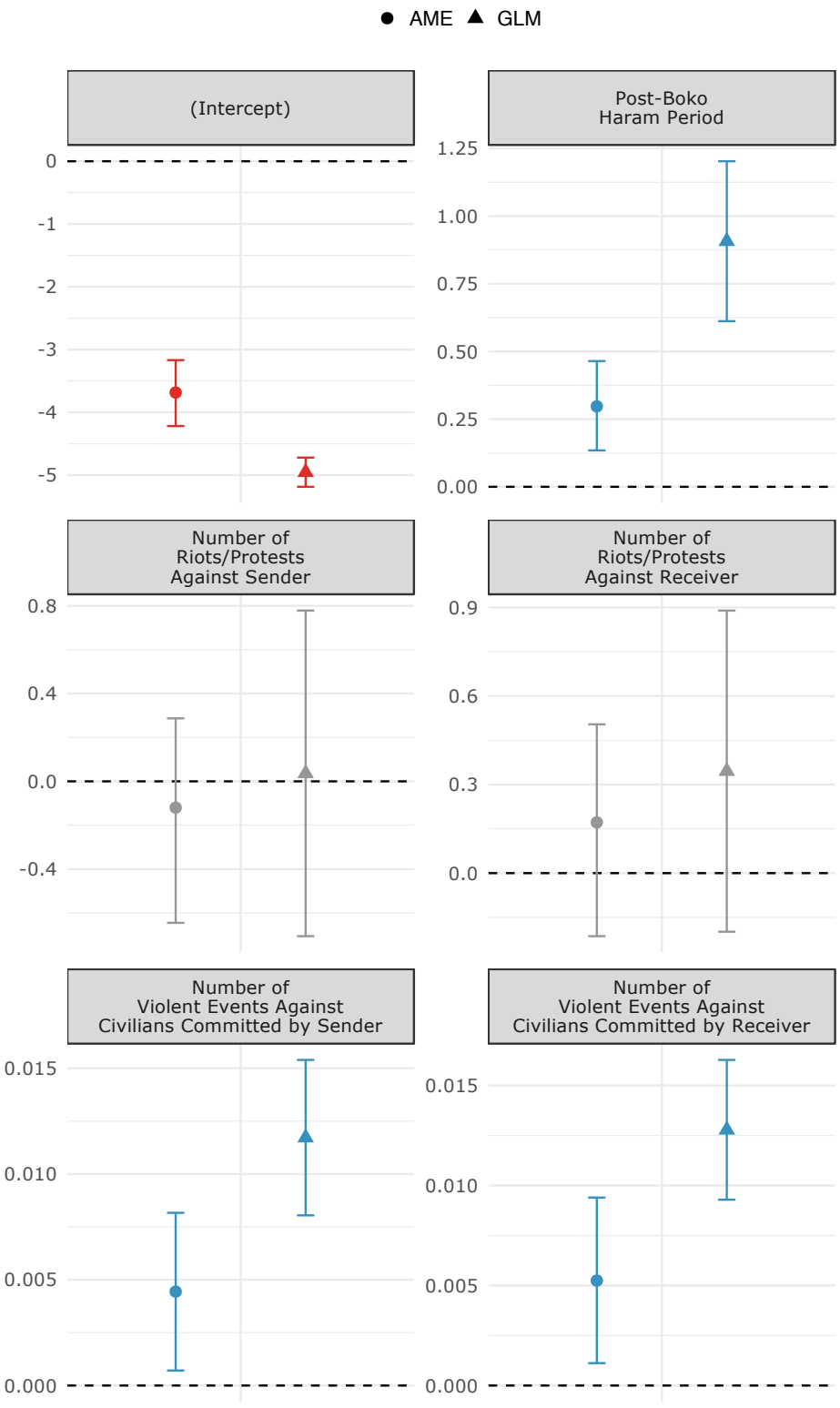

Figure 1: Exogenous parameter estimates from GLM and AME.

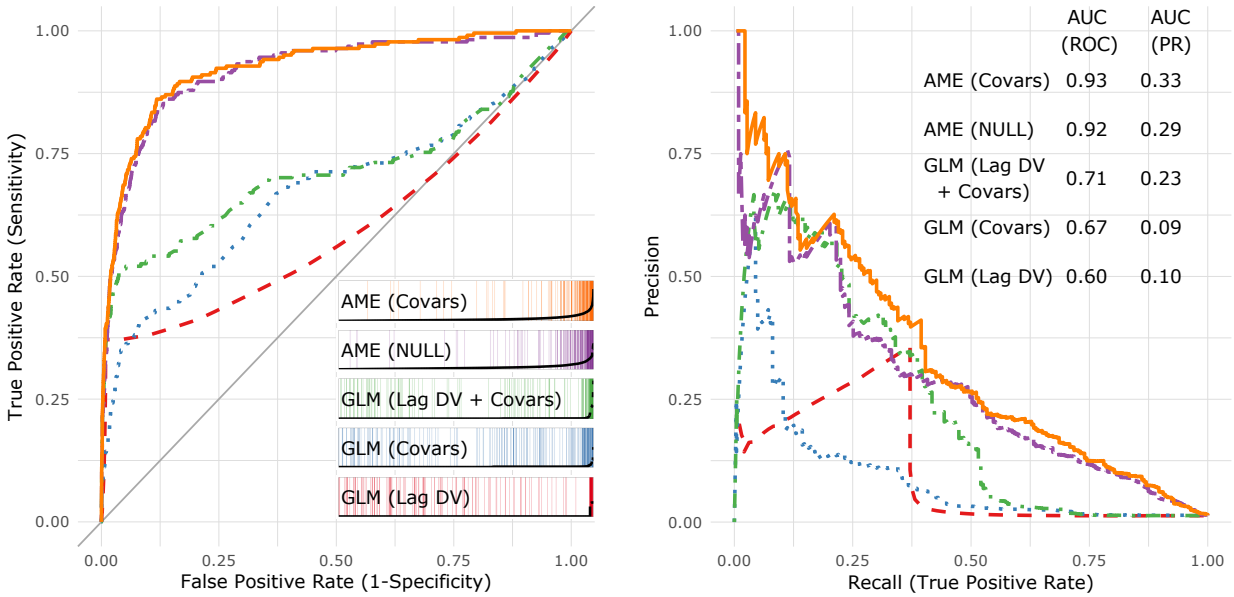

Figure 2: Assessments of out-of-sample predictive performance using ROC curves, separation plots, and PR curves. AUC statistics are provided as well for both curves.

Conclusion

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