

White Paper



Territoriality and Simmering
Feuds

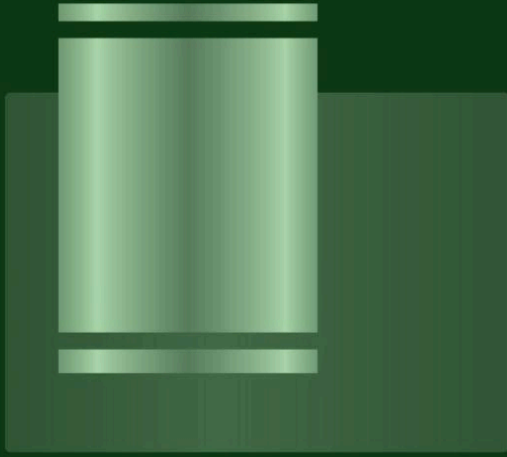
**THE ROLE OF ARTIFICIAL
BORDERS IN THE CONFLICT
RESOLUTION PROCESS**

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Abstract

Is there a relationship between ethnic fractionalization and the perpetual state of Hobbesian anarchy observable in many African countries? Controlling for military intervention, the relationship between ethnic fractionalization and Hobbesian conflict, south of the Sahara is examined, using the ethnic fractionalization index as an indicator of the potential for war. The Seemingly Unrelated Regression (SUR) approach was used to conduct correlational analyses of merged Correlates of War (COW) datasets, with the goal of examining the role of fractionalization in territorial (border) conflicts.

Introduction

For the sovereign state, if territory establishes jurisdictional authority, then it can be expected that conflict *comes with the territory*¹. Paradoxically, the Berlin-Congo conference of 1884—an ancient testament of the scramble for power in Africa, during the rise of imperialism—was arranged to divide territory so that colonial powers could *avoid* conflict during the ‘Scramble for Africa’. Referencing historical and cartographic evidence, Alesina, Easterly, and Matuszeski (2011) estimate that nearly 80% of Africa’s borders align with formal geographical lines of latitude and longitude, more so than in any other region on the globe—indicative of the non-random, artificial nature of the continent’s boundary lines. During the process, as arbitrary boundary lines were drawn to demarcate imperial territory—without regard for social and linguistic affiliations—tribes with little in common were forced into man-made territorial divides (Michalopoulos & Papaioannou, 2011a; Herbst, 1989).

On the map, these ‘artificial’ boundaries carved the African continent into neat imperial colonies; however, on the ground, these artificial boundaries run alongside deep-seated cultural divisions, bringing to bare certain tribal dysfunctions that exist when people groups with stark ethnolinguistic dissimilarities are forced into the same jurisdiction by man-made territorial divides.

¹ With the exception of San Marino—and arguably Switzerland, for her long-standing history of neutrality—most United Nations-recognized territories have experienced war.

If conflict *avoidance* was the goal of the former colonial powers, then, is it possible that, for those ethnic groups caught in the throes of the Scramble, the legacy of this colonial territorial arrangement has accomplished the opposite? Is it possible that artificial borders play a unique role in fueling ethnic conflicts over territorial claims in Africa?

The overarching goal of this study is to assess the relationship between ethnic fractionalization and Hobbesian conflict, south of the Sahara. Michalopoulos and Papaioannou (2011a) examine the long-run effects of the continent's partitioning on the likelihood of conflict and find that, when compared with ethnic groups that were not subjected to fractionalization, partitioned ethnic groups tended to experience enduring, more devastating civil conflicts. Based on the preceding, this study seeks to answer the following focused research questions: *Under what conditions do "artificial borders" represent supersystem maladaptations²? Is conflict resolution an effective approach for mitigating territorial conflict at the periphery?*

Consensus is yet to be reached as to whether conflict resolution strategies, like mediation, can secure peace, particularly in scenarios where conflict has been long-standing and appears unyielding. Ethnically fragmented nations are not restricted to the African continent — the Middle Eastern countries, like Israel, for example, have seen their share of border related violence. Alesina, Easterly and Matuszeski (2011) explain that artificial border divisions have drawn ire among nationalities and posit that the consequences of dividing ethnic/religious/linguistic groups into different countries has been disastrous for groups frustrated because their territory has been given away and their ambition for national independence has been overlooked. For some scholars, the dominant story of most artificially divided states, fighting for control of territory, has been long-running conflict (Autesserre, 2009; Michalopoulos & Papaioannou, 2011a; Lenggenhager, 2015; Hensel & Mitchell, 2005).

Thus, the overarching hypothesis of this study is that conflict resolution is inhibited in areas with high ethnic fractionalization because—if analyzed from a Hobbesian perspective—it may be possible to infer that ethnic fractionalization fuels enduring conflict. Despite the seemingly haphazard nature of the colonial borders, postcolonial nations have maintained the artificial demarcations instituted by bygone colonial administrations—mainly because the Organization of African Unity (OAU) has institutionalized a set of decision-making rules that have crystalised the continent's "artificial" borders.

² A dysfunctional subsystem that is of no value to the supersystem to which it belongs (See Mahner & Bunger, 2001).

Also, Herbst (1989) explains that—arbitrary as the borders may be—maintaining the stability of the-now-sovereign nations, carved out during an era-past, has become intricately intertwined with securing the boundaries and territorial integrity of neighboring sovereignties. Therefore, one could isolate an alternate hypothesis extant within the notion that artificial borders maintain the status quo, thereby *preventing* conflict. As such, a theoretical divide exists between scholars who view artificial borders as the root cause of Hobessian anarchy versus those who view artificial divides as necessary for securing territorial sovereignty.

Easterly and Levine (1997) advanced a study which uses ethnolinguistic fractionalization as a “standard” control in regression equations measuring cross-national differences in economic success on the African continent (Alesina, Devleeschauwer, Easterly, Kurlat, & Wacziarg, 2003, p. 2). To contribute empirical evidence that may contribute to the current theoretical divide, this study builds the approach used by Easterly and Levine, but instead of using ethnolinguistic fractionalization as a measure for economic success, ethnolinguistic fractionalization is used as a variable measure in explaining observed cross-national differences in territorial conflict.

Civil conflicts are never heterogenous. Political warfare studies often identify economic and political determinants of war, yet when cause-of-war factors are disaggregated from their aggregate political-economy category, ethno-sectarian influences cannot be treated as negligible (Sambanis, 2001). Thus, an added future expectation of this study, once it is complete, will be its contribution to the literature concerning ethnic determinants of war in the sub-Sahara.

Literature Review

The main premise of this study is that many African states have artificial borders that have politically defined borders and do not correspond to a partitioning of nationalities that support the coexistence of affected ethnicities (Alesina, Easterly, & Matuszeski, 2011). Zeleza (2008, p. 6) identifies six specific types of conflict that are pertinent to the African continent: secessionist; irredentist; devolution; regime change; social banditry; and, armed inter-communal insurrections. Wars of irredentism erupt when certain groups seek to join or be rejoined with a country of ethnic or historic affection (Zeleza, 2008, p. 7).

Within the literature, there are two diametrically opposing views on the relationship between ethnic diversity and state formation. Wimmer (2016, p. 1408) contends that ethnic diversity does not hinder state formation; rather, the author posits that diversity is a positive element necessary for “enhancing a vibrant, post-nationalist society”. However, many scholars (Khadiagala, 2010; Mbembe, 2000; Rossi, 2016; Samatar, Laitin, & Samatar, 1987) contend that when diversity in ethnicity, religion, language, and culture stews in a pot of social inequality, conflict boils over if power and control of territorial resources are thrown into the mix.

Ethnicity plays a role in wars of devolution wherein marginalized ethnic groups seek to readjust terms of state and political incorporation, but with the goal of decentralization, rather than secession (Veney, 2006). Further, in East Africa, irredentist conflicts among Somali, Kenyan, Ugandan, and Ethiopian ethnicities have been well documented (Khadiagala, 2010; Rossi, 2016; Samatar, Laitin, & Samatar, 1987; Chau, 2010). Khadiagala (2010) explains that, in Eastern Africa, present-day boundaries represent a compromise between colonial and post-colonial governing institutions to stabilize relationships on the periphery; and, over the years, border conflicts in East Africa have evaporated, leaving behind permanent partitions that are yet permeable to communal fluctuations. These fluctuations invite “territorializing temptations ... which may preclude or hinder negotiated settlement” (Rossi, 2016, p. 1). For example, Mbembe (2000, pp. 272-3) writes that Africa’s “great hydrographic basins, involving...rivers (the Congo, the Zambezi, the Niger, the Nile, the Senegal) and lakes (Lake Chad, Lake Victoria) ... tend to become new areas of conflict”.

Furthermore, to the west of the continent, Mbembe (2000) explains that from Senegal to Liberia, localized conflicts can be traced to transregional historical and social structures, and migratory expansions, that have ignited regional revolutions (p. 282). The eventuality has been a fragmentation of peripheral power structures in river countries, where, over time, these once-crystallized fragmented power structures on the periphery are now facing conflict-brewing opposition.

According to Moyo, “since 1996, eleven countries have been embroiled in civil wars (Angola, Burundi, Chad, Democratic Republic of Congo, Republic of Congo, Guinea Bissau, Liberia, Rwanda, Sierra Leone, Sudan and Uganda). And according to the May 2008 annual Global Peace Index, out of the ten bottom countries four African states are among the least peaceful in the world (in order, Central African Republic, Chad, Sudan and Somalia) – the most of any one continent. Why...?” (2009, p. 14). This salient question is yet to be decisively answered within the literature.

Partitioning and the Propensity for Conflict

Michalopoulos and Papaioannou (2011a) study the long-run effects of partitioning in Africa by using post-independence geospatial data to compare those ethnicities that remained intact (i.e., were not partitioned) with those that were divided along arbitrary borders. In all permutations of their sensitivity analyses, the findings remained significant: Ethnicities that were artificially partitioned “have experienced more civil war incidents that lasted longer and were more devastating in terms of casualties” (Michalopoulos & Papaioannou, 2011a, p. 25).

To quantify the rate of territorial partitioning with respect to ethnic groups on the continent, evidence is drawn from anthropological data pioneered by Murdock (1959) who, via spatial mapping, identifies the geographic distribution of 834 ethnic groups during the colonial era. Michalopoulos and Papaioannou (2011a) classify partitioned ethnic groups as ethnicities whose country of origin shares at least 10% of the total land area with more than one nation —231 of 834 total geographic ethnic distributions fell into this category. With a more restrictive benchmark requiring a country to be partitioned such that ethnic groupings share 20% of the total land area with more than one other nation, 164 ethnicities were parted by random border lines (Michalopoulos & Papaioannou 2011a). The Chewa ethnic group, for example, was partitioned between Mozambique (50%), Malawi (34%), and Zimbabwe (16%). The Malinke were split into six different countries and rank as one of the most fractionalized ethnicities, according to the fractionalization index (Michalopoulos & Papaioannou, 2011b).

Countries with high fractionalization indices (multiple ethnicities within the same border) – for example, DRC (0.87), Congo (0.87), Uganda (0.93) show higher propensities for long-lasting civil conflict (Alesina et al. 2011).

Goeman and Schultz (2015) examine territorial conflicts by applying a novel geospatial approach to data derived from digital maps of territorial claims made by central governments in Africa (pp. 31-32). The authors note that domestic political leaders benefit from siding with irredentist claims made by ethnic groups divided along artificial border lines (2015, p. 32). The novelty in their analytical approach stems from the level of granularity achieved by disaggregating the characteristics of disputed territory, such that specific sections of a border being disputed could be located.

This differentiated their approach from previous dyadic (disputed vs. undisputed) aggregates of border conflict analyses that could not reliably provide location-specific information influencing specific claims to territory, for example, ethnic groupings, settlement patterns, and resources. Goeman and Schultz “find that ethnic political considerations are the most important driver of territorial claims in Africa” (p. 31).

Theoretical Considerations: Mediation as a Conflict Resolution Tool

Beardsley (2008) evaluates the role of mediation by addressing the contending academic diatribe that exists concerning the utility of international mediation within the realm of international political scuffles – consensus is yet to be reached as to whether or not mediation can secure peace. Beardsley (2008) employs a theoretical framework, which supports the idea that mediation is effective in the short-term, but is an inadequate peace-keeping method for the long-run. Hensel and Mitchell (2007) echo a similar assertion, which suggests that in the short run, states are less likely to defect from an agreement if they perceive (as an eventuality) future interactions that will engender positive payoffs.

Fearon (1998) addresses the long-run problematique from the institutional standpoint by explaining that repetitive interactions may make some agreements harder to forge, but in the eventuality that an agreement is forged, such an agreement will be durable³ — this is in contrast to Beardsley’s (2008) assessment of the long-term effectiveness of mediation (as an instrument of institutionalism), which is purported to wane over time because mediators generally do not remain involved in the long-term evolution of a crisis, thus any short-lived mediation-victory weakens as actors’ bargaining positions shift and evolve with time.

Moreover, Beardsley (2008) elucidates that mediation terms are usually not self-enforcing – meaning that because of the time inconsistency factor already associated with mediation, as bargaining positions shift/change with time, disputes may be re-hashed or exacerbated when short-term agreements are reneged. Beardsley (2008) references historical models in affirming that the ability of mediation to assuage post-conflict relations diminishes over time, up until the point where mediation may actually re-ignite conflict down the line. Mediation has also not seen much viability in the arena of crisis recurrence, as a result of the time-dependent incongruencies associated with this method of conflict resolution.

³ Fearon, James D. 1998. "Bargaining, Enforcement, and International Cooperation." *International Organization* 52(2): 269- 305.

Walter draws a distinction about the effectiveness of negotiated settlements based on the type of war (civil vs. interstate) being waged. Contending with the scholarly viewpoint that civil wars tend to meet their end only on the battlefield (unless a third party steps in), Walter (1997) argues that civil war negotiations seldom culminate with successful peace agreements because combatants are not likely to arrange credible guarantees of settlement terms. Negotiations fall through the cracks of dispute when civil war opponents cannot agree to the terms of surrender – usually because warring parties consider portions of the peace terms unthinkable/impossible to accept, particularly during a time period wherein there are no legitimate legal institutions or governing bodies to enforce contract terms.

Accordingly, Walter (1997) explains that civil war negotiations ultimately fail because adversaries are unable to exhibit the level of credibility necessary to abide by and guarantee the “dangerous terms” set forth in negotiation commitments – terms seen as likely to leave the warring parties vulnerable (absent of outsider enforcement, i.e., government, IOs, etc.) (pg. 336).

Referencing the nexus of bargaining and mediation proposed by Beardsley (2008), within the context of civil war negotiations, the leveraging of conflict costs appears to be the dominant peace inhibitor because mediation strategies typically fail to solidify long-term peace and may exacerbate conflict when (absent of a third party) dissatisfying terms of agreement are presented. Providing further support for the Walter (1997) argument that civil wars seldom meet peaceful resolutions, Beardsley (2008) explains that credible commitment problems derail the perceived trade-off between short-term peace and long-term conflict resolution at the bargaining table, making the prospect for stable resolution agreements all the more grim for mediated civil wars.

Walter (1997) frames the process of maintaining peace in an anarchic environment as a classic case of “prisoners’ dilemma”, wherein even though both warring parties can benefit from peaceful cooperation, both sides are aware of the possibility of being worse off should either party bring down their guard enough to surrender and have their trust exploited by the opponent.

Surviving strands of institutionalist theory largely accept many core assumptions of realism (namely, that anarchy is the state of nature and states behave as rational egoists), but argue that when actors strive to create rules between them, they alter the conditions in which decisions are made, and therefore the preferences of actors change in response to decisions as they unfold. Moving beyond the prisoner’s dilemma would require an assumption that negates self-seeking behavior in favor of mutual cooperation, with the end-goal being an entrenched peace agreement process that not only prevents shirking on the terms of the agreement between warring parties, but also

promotes cooperative relationships. Walter (1997) explains that states within the international community have developed military and economic incentives that encourage cooperation, even when cheating is preferred. Structures like international institutions and regimes play an important role in establishing such processes, through which general rules of behavior can be agreed upon. Echoing the assertions of institutionalists, Axelrod and Keohane (1985), when anarchy reigns supreme, chaos can be transcended via institutions that promote incentives rewarding trust, reputation, and long-term cooperation.⁴

Theoretical Considerations: Structural Functionalism Theory

When considering competition among nations seeking to exercise dominance on the international stage, Hui (2004) proposes a dynamic theory of international politics, which encompasses a variety of spurious possibilities and endogenous shifts that contribute to power politics, the exertion of power, and the balance of power (once dominance is achieved). The competition for territorial dominance often necessitates exercising power through politics, aggression, and perhaps, a toxic mix of both, to establish dominance. To explain how power is exerted and exercised in the realm of turf expansion, constructivists emphasize the role shared norms and international institutions play in soothing power politics in relation to territorial disputes (Hui, 2004).

One way to establish dominance in warfare is through the expansion of territory. This study applies the theoretical constructs of the dynamic theory of international politics to the precepts of structural functionalism and primordial sociality within the realm of territoriality in Africa, with the goal of examining conditions wherein ethnicities partitioned along "artificial" border lines compete for territorial dominance.

Smith (1986), Suhrke and Noble (1977) turn to affective motivation to illustrate the salience of ethnicity in conflict. Sambanis (2001) expounds on this notion further by explaining that fraternity among ethnic cleavages converge towards actions that safeguard the genetic evolution of the group. Society exists, not in isolation, but in conjunction with, and as a structural component of, several systems interacting together. Bourricaud (2005), explains, in the most basic terms, that structural functionalism is simply an "...effort to impute [or credit], as rigorously as possible, to each feature, custom, or practice, its effect on the functioning of a supposedly stable, cohesive system" (p. 94). The structural functionalism theory posits that society cannot exist in seclusion; rather, society is composed of several different systems interacting together (Mahner & Bungler, 2001).

⁴ Robert Axelrod and Robert O. Keohane, "Achieving Cooperation Under Anarchy: Strategies and Institutions," *World Politics*, Vol. 38, No. 1 (Oct., 1985), pp. 226-254.

Functionalists argue that society can be compared to a living organism, in the sense that both a society and an organism are made up of interdependent working parts and organs (systems) that must function together in order for the greater body to function. Society is, thus, a whole unit (supersystem) composed of interrelated working parts (subsystem) (Henslin, 2008). Thus, at the subsystem level, where we find ethnic cleavages, the primordial instinct to safeguard the genetic evolution of the group runs parallel to the goal of the supersystem, which is to safeguard its associated subsystem(s).

Understanding the conflict between ethnic groups on the periphery is a dilemma that remains enmeshed in historical conjecture and uncertainty. According to Mahner and Bungler (2001), the role of a subsystem is based on how said subsystem functions in the supersystem of which it is a part. Samatar and Samatar (1987, p. 669) propose a perspective that focuses on two dimensions: structural constraints and subjective conditions. Structural constraints underscore the historical, the habitual, 'the grid of inheritance' (Samatar & Samatar, 1987, p. 669). Subjective conditions refer to decisions made in the time-space continuum between the past and future. In other words, subjective conditions—which Smith (1986), Suhrke and Noble (1977) and Sambanis (2001) characterize as the affective motivation behind ethnic cleavages—may collide with structural constraints (i.e., the grid of inherited borders) in the time-space continuum. Said collisions may produce friction among ethnic subsystems.

If we view the dynamic theory of international politics from its theoretical angle of establishing power through politics, then, as a case in point, we can make room for the role of the international organization (international supersystem, e.g. UN Peacekeeping) tasked with managing conflict between (subsystems) ethnic groups on the periphery. Karaman and Pamuk (2013) argue that state-building (a supersystem function) has three main building blocks: i) protection of state boundary lines through warfare, ii) provisioning of economic structure, and iii) establishment of a political regime. These three determinants are interwoven to such a degree that gains made in domestic, fiscal, and interstate policies necessitate their successful interaction (Karaman & Pamuk, 2013).

Further, as the law of diminishing returns would have it, as a state gains increasing territorial advantage, expansion costs begin to rise in direct contrast to the rewards from continued expansion, which dips and decreases over time. If expansion continues beyond the point where the marginal cost of expansion is greater than the marginal benefit, the ambition of state-domination will be overshadowed by economic constraints.

As such, although the state may abandon its quest for dominance at the national level (for any number of reasons), at the borderlines, if ethnic fractionalization is present as a pre-existing condition, skirmishes are often kept alive, in somewhat of a Hobbesian atmosphere that feeds off of long-standing ethnic friction.

Reiterating the study's main premise: a mutual symbiosis exists between ethnic fractionalization and enduring conflict. Thus, as highlighted by the dynamic theory of international relations, competition for territorial dominance is exercised through power politics and aggression, which find expression both at the supersystem and subsystem levels. At the subsystem level, conflict can find continued strength in affective motivations deeply entrenched within ethnic cleavages.

Structural functionalism idealizes harmonious social relationships and underscores the notion that the contributions made by various members of society (government, businesses, military, etc.) are essential for the protection of human security, in particular, and crucial to the survival of society, in general (Merton, 1957).

By extension, for the international peacekeeping organization with the goal of bringing resolution to interstate ethnic violence, their work is a necessary "...social function...an objective feature of society that contributes to its cohesion and thereby to its continuity or 'survival'" (Mahner & Bungler, 2001, p. 6). From the perspective of the structural functionalist, the role of conflict resolution can be examined in terms of its impact on the functions of both the sub-and-super system. In a Hobbesian environment, the impact of conflict resolution 'message structuring' could be an indispensable component of social aptation⁵. In essence, this study seeks to determine whether—in a Hobbesian universe of ethnic conflict—conflict resolution is an aptation, malaptation⁶ or nullaptation⁷. The following working hypotheses are considered:

H₁: *Areas with a high ethnic fractionalization have a lower propensity towards conflict resolution than areas with a low ethnic fractionalization.*

⁵ If, as a whole, the function of a subsystem is valuable to the supersystem (e.g. state), then the subsystem is referred to as an *aptation* (Mahner & Bungler, 2001).

⁶ If the function of the subsystem is not valuable to the supersystem, then the subsystem may be —indifferent or disvaluable (dysfunctional) (Mahner & Bungler, 2001) — a *malaptation* (or malfunction or dysfunction. "Dysfunctions are consequences that harm society. They undermine a system's equilibrium" (Henslin, 2008, p. 16).

⁷ Mahner and Bungler refer to a function that is neutral in nature is called a *nullaptation*.

H₂: When ethnicity is an underlying factor, issue salience further inhibits the likelihood of conflict resolution. In other words, the stronger the issue salience, the lower the likelihood of conflict resolution.

As aforementioned, one way to establish dominance in warfare is through the expansion of territory. However, because this study considers border scuffles between ethnic groups as power/territorial grabs that are not state sanctioned, this study controls for state intervention in inter-ethnic conflicts.

Research Design

The research design is non-experimental retrospective correlational and involves a dynamic analysis of the relationship between ethnic fractionalization and conflict resolution strategies (mainly agreement and settlement correlates). The main hypothesis for this study is that high levels of ethnic fractionalization signal volatility in locales where borders have been artificially constructed. Testing the study hypotheses will necessitate the proper identification of divisions (both between-and-within group) among country-specific ethnic groups, and mapping regions where warfare is prevalent. In evaluating the study hypotheses, the goal of this research is to re-introduce objectivity into preconceived notions concerning the relationship between ethnic divisions and warfare, by measuring the degree to which ethnic groups are fractioned along borders and relating this measure with violent incidents along fractured border lines. This fractionalization measure was based on the approach pioneered by Alesina et al. (2003), which calculates an ethnic fractionalization index for each nation-pair sharing a border.

Measuring border artificiality: Fractal dimension

Alesina, Easterly, and Matuszeski (2011) developed a measure of *fractal dimension*, which equates border symmetry to a geometric measure. Using a fractal number to indicate the dimensions of borderlines, the authors capture how closely a border represents a straight line, i.e., straight/box-like lines were

assumed to have been drawn artificially and were assigned a fractal dimension of 1. Haphazard lines on a map were equated with naturally occurring geographic divisions (e.g., mountains, rivers, etc.). The authors do note the possibility that borders that look haphazard may also be artificial and that, in some instances, straight borders may not necessarily be unnatural. This study used the fractal measure provided by Alesina and colleagues to investigate the possibility of a correlation between fractionalization and conflict.

Units of Analysis

As aforementioned, according to (Moyo, 2009), eleven African countries have been entangled in enduring civil war since 1996. The identified war-entangled

Measuring ethnic fractionalization (within-and-between group)

Using the fractionalization measure as a correlate that signals the potential for war, correlational analyses were carried out using the merged COW datasets for the identified study units of analyses. These countries were chosen specifically because of their colonial heritages, historical record of border instability, and high ethnic diversity. Examining how ethnic diversity plays a role in cross-country differences in conflict resolution requires not only an understanding of how the *same* ethnicities are split into different countries along artificial divides, but also how high ethnic fractionalization correlates with enduring conflict, and produces cross-country differences in conflict resolution.

As this study progresses, to quantify the rate of territorial partitioning with respect to people groups on the continent, evidence will be drawn from anthropological data pioneered by Murdock (1959) who, via spatial mapping, identified the geographic distribution of 834 African ethnic groups during the colonial era.

Michalopoulos and Papaioannou (2011a) classify partitioned ethnic groups as ethnicities whose country of origin shares at least 10% of the total land area with more than one nation —231 of 834 total geographic ethnic distributions fell into this category. With a more restrictive benchmark requiring a country to be partitioned such that ethnic groupings share 20% of the total land area with more than one nation, 164 ethnicities were parted by random border lines (Michalopoulos & Papaioannou 2011a).

The Chewa ethnic group, for example, was partitioned between Mozambique (50%), Malawi (34%), and Zimbabwe (16%). The Malinke were split into six different countries and rank as one of the most fractionalized ethnicities, according to the fractionalization index (Michalopoulos & Papaioannou, 2011b). Countries with high fractionalization indices (multiple ethnicities within the same border) – for example, DRC (0.87), Congo (0.87), Uganda (0.93) show higher propensities for long-lasting civil conflict (Alesina et al. 2011). Thus, the within-group fractionalization variable will be a percentage of a single country's population that is split across border lines of two or more nations.

This study defines partitioned groups based on the percentage of a country's ethnic population that has been divided between two countries sharing a border. The assumption for the partitioned group variable is that

when the same ethnic group exists on both sides of a shared border, the border was likely imposed “artificially”, as most ethnic groups prefer to cleave together

in the same area (Alesina, Easterly, & Matuszeski, 2011). A co-ethnic score (between-group) will be used to assess the degree to which ethnic homogeneity is present among partitioned groups.

Overall, defining a fractionalization measure and a co-ethnic score is expected to bring to the fore the level of ethnic discontinuity present along artificially defined borders. The *Narodov Mira* atlas was initially used to geo-locate ethnicities around the globe; then, in 2010, Weidmann, Rød, and Cederman in 2010 converted the atlas to digital information (Geo-referencing of Ethnic Groups (GREG) dataset) (Goemans & Schultz, 2015), which will be referenced in this study.

Controls

Since the focus is not on state-level territorial expansion, military intervention by the state was controlled for. Although it is possible to hypothesize that leaders wanting to hold on to power may use territorial expansion as a means to said end, this study is not concerned with state-sanctioned violence. Further, and arguably, if, out of two adjacent countries, one large state already owns the larger portion of territory, then the larger state is likely to be content with the status quo, and may, therefore, ignore skirmishes at the border. State ability to exert control (via military expenditure) over border claims⁸ was also be controlled for since the logic applied to a large state here is that, if the land area being contested is far from the nation’s capital, the likelihood of state intervention in border scuffles will be inversely related to the distance of the contested land area.

In other words, the farther a state capital is from the border, the lower the likelihood of state intervention over border disputes. The U.S. equivalent would be Chicago, where violence in urban areas is largely ignored at the national level, or not given as much coverage relative to other news reports (perhaps with the exception of local Chicago-area news coverage). And so, whilst overall U.S. state and national level operations have not grinded to a halt as a result of the level of violence in some Chicago districts, unchecked violence can still be attributed to a maladaptation of overall state, and even national-level functionality.

Regression Framework

Since the study focus is on enduring conflict, the goal is to develop a model that abstracts conflict flare-ups by studying fluctuations in violent cycles over four

⁸ This is a Correlates of War National Material Capabilities Measure.

decades: 1970-2010. The explanatory variables will thus include fractal measures for all four countries in the dataset.

Equation estimation was based on a seemingly unrelated regressions (SUR) approach, and were intuitively defined as follows:

- Equation for *Ethnic*:

$$\text{agrmnt} \sim \text{Ethnic_Frac} + \text{Linguistic_Frac} + \text{Religious_Frac}$$

- Equation for *Settle*:

$$\text{agrmnt} \sim \text{ICOW.sum} + \text{obs.max} + \text{saltan.sum} + \text{salindx.sum} + \text{cowsal.sum} + \text{cowsalc.sum} + \text{terrchange.sum}$$

Variables were added and removed during a series of six model testing phases to assess the power of ethnic fractionalization on agreement and settlement variables and to capture possible convergence effects over the different stages of analyses.

Data Analysis

This study required merging and aggregating several raw data sets⁹. The main Interstate COW dataset used in this study was gleaned from Correlates of War (COW) Project and was merged with *dyadic*, *monadic* and *settlement process attempt* datasets from the International Border Agreements Dataset (IBAD) collection. The National Material Capabilities (NMC) dataset was also merged to the rest of the study data to extract the relevant study state control measures. Although the initial goal was to evaluate the time period between 1970 and 2010, the relevant data was not available for this time period. The study time frame is from 1889 to 2001.

Results

Table 1. Model Testing: Phase 1. SUR analyses of relationship between the settlement correlates, ethnic fractionalization measures, and agreement.

	Estimate	Std. Error	t value	Pr(> t)
Ethnic_(Intercept) ¹⁰	0.7328	0.255	2.871	0.0111*
Ethnic_Ethnic_Frac	-0.4544	0.356	-1.278	0.2196
Ethnic_Linguistic_Frac	0.8315	0.304	2.732	0.0148*
Ethnic_Religious_Frac	-1.134	0.232	-4.889	2e-04***
Settle_(Intercept)	3.165	1.351	2.342	0.0372*
Settle_ICOW.sum	0.04076	0.194	0.21	0.8374
Settle_obs.max	-0.03608	0.014	-2.581	0.024*
Settle_saltan.sum	1.022	0.953	1.072	0.3047
Settle_salindx.sum	1.064	1.013	1.051	0.3141
Settle_cowsal.sum	-0.9813	0.937	-1.048	0.3155

⁹ See Appendix A for coding definitions.

¹⁰ Variable names defined in Appendix A.

One advantage of using a SUR approach is that it allows linear models to be stacked against each other in such a way that a set of regression equations, each a unique dependent variable with an associated set of exogenous explanatory variables, can be jointly estimated. The major assumption made by this approach is that the model error terms are expected to be correlated across equations. The `systemfit` R package was used to specify a system of unique equations for each of the six total model testing analytical phases.

For each modeling phase, once the models specified were analyzed, a summary of the joint system is given (N=40 (20 for each model specified)); followed by a summary of the separate results; and finally, covariance and correlations matrices showing the residuals.

Since the main focus of this study centers on the relationship between ethnic fractionalization and conflict resolution, when state-sanctioned violence is not a factor, state intervention controls were added during the final stages of analyses.

Table 1 is the output from the initial set of analyses evaluating the relationship between the settlement process, ethnic fractionalization, and agreements. To evaluate the influence of ethnic fractionalization, agreement was regressed against ethnic, linguistic, and religious fractionalization variables. Religious fractionalization was added to reduce the likelihood of omitted variable bias.

To assess the likelihood of settlement, the agreement variable was regressed against variables believed to carry weight (at face value) with regards to the propensity for settling a conflict, e.g., issue salience. Agreement was the dependent variable in both equations in the first run. Fractionalization showed a high level of significance, so for this reason, in the second model testing phase, the agreement dependent variable was kept in the first model, but was replaced in the second model with a new dependent measure—territorial claim—because the goal is to see how significant ethnic fractionalization is amongst a varied set of variable interactions.

In the second stage, fractionalization did show significance along linguistic and ethnic divides, but it remained significant for religious components (see Table 2). When the military controls were added (Table 3), the linguistic variable showed significance, but with low power. The controls were mostly insignificant, or had low power when they were significant -- with the exception of the national averaged composite indexed score. The influence of

the settlement variable seems to have been tempered with the addition of state-control measures.

Table 2. Model Testing: Phase 2. SUR analyses of relationship between the settlement correlates, ethnic fractionalization measures, and territorial claim measure.

	Estimate	Std. Error	t value	Pr(> t)
Ethnic_(Intercept)	0.8265	0.587	1.407	0.1785
Ethnic_Ethnic_Frac	-1.005	1.599	-0.628	0.5387
Ethnic_Linguistic_Frac	2.173	1.373	1.583	0.1329
Ethnic_Religious_Frac	-2.31	0.957	-2.415	0.0281*
Settle_(Intercept)	2.711	1.545	1.755	0.1027
Settle_obs.max	0.02551	0.018	1.412	0.1815
Settle_saltan.sum	-4.234	0.72	-5.877	1e-04***
Settle_salindx.sum	-4.519	0.754	-5.992	0***
Settle_cowsal.sum	4.097	0.732	5.595	1e-04***
Settle_cowsalc.sum	1.272	0.077	16.467	0***
Settle_terrchange.sum	-3.563	0.948	-3.758	0.0024**

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, $p < 0.1$

Note: Agreement is the dependent variable in model 1 and territorial claim is the model 2 dependent variable for this joint estimation output.

Table 3. Model Testing: Phase 4. SUR analyses of relationship between the settlement correlates, ethnic fractionalization measures, with addition of state control measures.

	Estimate	Std. Error	t value	Pr(> t)
Ethnic_(Intercept)	0.4168	0.234	1.78	0.0941
Ethnic_Ethnic_Frac	-0.03344	0.057	-0.584	0.5674
Ethnic_Linguistic_Frac	0.2424	0.06	4.068	9e-04***
Ethnic_Religious_Frac	-0.2988	0.055	-5.386	1e-04***
Settle_(Intercept)	0.3893	0.294	1.324	0.2103
Settle_ICOW.sum	0.04177	0.012	3.38	0.0055**
Settle_obs.max	-0.003048	0.001	-3.326	0.006**
Settle_saltan.sum	0.3144	0.078	4.029	0.0017**
Settle_salindx.sum	0.3333	0.082	4.045	0.0016**
Settle_cowsal.sum	-0.3094	0.077	-4.013	0.0017**
Settle_cowsalc.sum	-0.06229	0.016	-3.824	0.0024**
Settle_terrchange.sum	0.1066	0.06	1.772	0.1017
Military_(Intercept)	0.4153	0.268	1.552	0.1447
Military_milex.avg	-4.203e-07	0	-1.448	0.1712
Military_milex.max	1.421e-07	0	1.889	0.0814
Military_milper.avg	0.001835	0.001	1.312	0.2124
Military_milper.max	-0.002412	0.001	-4.734	4e-04***

Military_cinc.avg	-51.58	19.915	-2.59	0.0224*
Military_cinc.max	79.7	15.935	5.002	2e-04***

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, . $p < 0.1$

Note: Agreement is the dependent variable in both model 1 and model 2 in this joint estimation output.

Limitations

The study sample size is relatively small, which may be affecting the power of the overall sample predictions. Also, the study analyses exclude border measures, owing to the availability of data. A future study could consider a test for country-specific differences in the magnitude of the effects associated with each indicator variable, to further examine the level of granularity observable in the interplay between conflict resolution and ethnic fractionalization.

Additionally, for future research, the borders which pass through GREG-identified areas can be used in conjunction with correlational analyses of the SUR results to draw inferences about the stated hypotheses.

Concluding Thoughts

Extant studies, several scholars (Khadiagala, 2010; Mbembe, 2000; Rossi, 2016; Samatar, Laitin, & Samatar, 1987) contend that if ethnic diversity, religion, language, and culture stew in a pot of social inequality, conflict will boil over when power and control of territorial resources are thrown into the mix. The persistence of the religious fractionalization variable may be a testament to this, although the other fractionalization measures find no support with the preliminary study results.

Nevertheless, there are two diametrically opposing views concerning the relationship between ethnic diversity and state formation. Wimmer (2016, p. 1408) contends that ethnic diversity does not hinder state formation; rather, the author posits that diversity is a positive element necessary for “enhancing a vibrant, post-nationalist society”. However, the behavior of the ethnic and linguistic fractionalization measures seems to support this notion. In the second stage, fractionalization did show significance along linguistic and ethnic divides, but it remained significant for religious components (see Table 2).

Bibliography

- Alesina, A., Baqir, R., & Easterly, W. (1999). Public Goods and Ethnic Divisions. *The Quarterly Journal of Economics*, 114(4), 1243-1284.
- Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., & Wacziarg, R. (2003). Fractionalization. *Journal of Economic Growth*, 8(2), 155-194.
- Alesina, A., Easterly, W., & Matuszeski, J. (2011). Artificial states. *Journal of the European Economic Association*, 9(2), 246-278.
- Autesserre, S. (2009). Hobbes and the Congo: Frames, Local Violence, and International Intervention. *International Organization*, 63(2), 249-280. Retrieved from <http://www.jstor.org/stable/40345934>.
- Beardsley, K. (2008). Agreement without peace? International mediation and time inconsistency problems. *American Journal of Political Science*, 52(4), 723-740.
- Bourricaud, F. (2005). *The Sociology of Talcott Parsons*. Chicago University Press.
- Chau, D. C. (2010). At the Crossroads of Cultures? A Historic and Strategic Examination of Kenya-Somalia Relations. *Journal of the Middle East & Africa*, 1(1), 67-84.
- Easterly, W., & Levine, R. (1997). Africa's growth tragedy: Politics and ethnic divisions. *Quarterly Journal of Economics*, 112(4), 1203-1250.
- Fearon, J. D. (1998). Bargaining, Enforcement, and International Cooperation. *International Organization*, 52(2), 269-305.
- Goemans, H. E., & Schultz, K. A. (2015). *The politics of territorial disputes: a geospatial approach applied to Africa*. New York: University of Rochester.
- Hensel, P. R. (2008). Territory and Contentious Issues. In W. R. Thompson, *Encyclopedia of Empirical International Relations Theory*.
- Hensel, P. R., & Mitchell, S. M. (2005). Issue indivisibility and territorial claims. *GeoJournal*, 64, 275-285.
- Hensel, P., & Mitchell, S. M. (2007). International institutions and compliance with agreements. *American Journal of Political Science*, 51(4), 721-737.
- Henslin, J. (2008). *Essentials of Sociology: A down-to-earth approach*. Boston: Pearson.
- Herbst, J. (1989). The creation and maintenance of boundaries in Africa. *International Organization*, 43(4), 673-692.
- Hui, V. T. (2004). Toward a dynamic theory of international politics: insights from comparing ancient China and Early modern Europe. *International Organization*, 58(1), 175-205.
- Karaman, K. K., & Pamuk, S. (2013). Different paths to the modern state in Europe: The interaction between warfare, economic structure, and political regime. *American Political Science Review*, 107(03), 603-626.
- Khadiagala, G. M. (2010). Boundaries in Eastern Africa. *Journal of Eastern African Studies*, 4(2), 266-278.

- Lenggenhager, L. (2015). Nature, War and Development: South Africa's Caprivi Strip, 1960– 1980. *Journal of Southern African Studies*, 41(3), 467–483.
- Mahner, M., & Bungler, M. (2001). Source, function and functionalism: A synthetic perspective. *Philosophy of Science*, 68(1), 75-94.
- Mbembe, A. (2000). At the Edge of the World: Boundaries, Territoriality, and Sovereignty in Africa. *Public Culture*, 12(1), 259-283.
- Merton, R. K. (1957). *Social theory and social structure*. Glence, Illinois: Free Press.
- Michalopoulos, S., & Papaioannou, E. (2011a). *The Long Run Effects of the Scramble for Africa*. CEPR Discussion Paper 8676.
- Michalopoulos, S., & Papaioannou, E. (2011b). Divide and rule or the rule of the Divided? Evidence from Africa (No. w17184). *National Bureau of Economic Research*.
- NamRights. (2014). *Namibia dossier containing evidence of: Complicity in and impunity for torture and ill-treatment*. Windhoek: NamRights Inc. Retrieved from http://tbinternet.ohchr.org/Treaties/CCPR/Shared%20Documents/NAM/INT_CCPR_CSS_NAM_23059_E.pdf.
- Rossi, C. R. (2016). The Migingo Island Dispute between Kenya and Uganda. *Brooklyn Journal of International Law*, 42(2).
- Samatar, A. I., Laitin, D. D., & Samatar, S. S. (1987). *Somalia: Nation in search of a state*.
- Samatar, A., & Samatar, I. (1987). The material roots of the suspended African state: Arguments from Somalia. *Journal of Modern African Studies*, 25(4), 669-690.
- Sambanis, N. (2001). Do ethnic and non-ethnic civil wars have the same causes? A theoretical inquiry (Part 1). *The Journal of Conflict Resolution*, 45(3), 259-282.
- Smith, A. D. (1986). Conflict and collective identity: Class, ethnic and nation. In b. E. B, *on. In International*. Boulder, CO: Lynne Reinner.
- Suhrke, A., & Noble, L. G. (1977). *Ethnic conflict and international relations*. New York: Praeger.
- Veney, C. (2006). Forced migration in Eastern Africa: democratization, structural adjustment, and refugees.
- Wimmer, A. (2016). Is diversity detrimental? Ethnic fractionalization, public goods provision, and the historical legacies of stateness. *Comparative Political Studies*, 49(11), 1407-1445. doi:10.1177/0010414015592645.
- Zezeza, P. T. (2008). Introduction: The causes & costs of war in Africa. In A. Nhema, & P. T. Zezeza, *The roots of African conflicts: The causes & costs*. Athens, Ohio: Ohio University Press.

Appendix A

Columns	Descriptions
Country	Observed Country
Ethnic_Frac	Ethnic Fractionation
Linguistic_Frac	Linguistic Fractionation
Religious_Frac	Religious Fractionation
StateAbb	Abbreviate of State Names
ccode2	Country code, used from raw dataset for merging data and aggregating
ICOW.sum	Sum of 'ICOWterrclaim' - sum of territorial claims by each Country
obs.max	Maximum of Dyad observation
saltan.sum	Sum of ICOW tangible salience index
salindx.sum	Sun of ICOW intangible salience index
cowsal.sum	Sum of ICOW salience index
cowsalc.sum	Sum of ICOW categorical salience index
terrchange.sum	Sum of Tir terr change variable
conttype.median	Most common type of contiguity of Country
agrmnt	Sum of signed agreement
milex.avg	Averaged Military Expenditures
milex.max	Maximal Military Expenditures
milper.avg	Averaged Military Personnel
milper.max	Maximal Military Personnel

cinc.avg	Averaged Composite Index of National Capability (CINC) score
cinc.max	Maximal Composite Index of National Capability (CINC) score
