

Conflict Heterogeneity in Africa*

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Abstract

The economic development literature widely concurs that conflicts have adverse economic consequences that contribute to poverty, disinvestment, and lower human capital leading to widespread inequality and lower economic growth. As such, understanding the nature of conflict has been an important focus for political leaders, policymakers and researchers alike. However, the existing literature does not typically distinguish between the effects of conflict determinants on conflicts by type of actor or aggressor (i.e. state, group and civilian-based). Using panel data analysis for 46 African countries from 1997 to 2017, and a comprehensive geo-referenced ACLED conflict dataset, we find evidence of variation in the determinants' effects on conflicts by actor types. For the full sample of countries, we find that military expenditure decreases civilian-based conflicts, globalisation increases both state and civilian-based conflicts while state fragility increases group-based conflicts. On the other hand, income per capita increases all three types of conflicts. At regional level, we find variation in the effects of military expenditure and globalisation on state and civilian-based conflicts. However, we find little variation in the effects of the determinants on group-based conflicts across the regions. The findings highlight the nuances in conflicts by actor types and their causes which need to be accounted for when formulating conflict resolution policies.

Keywords: conflict, heterogeneity, Africa

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1 Introduction

The debate surrounding causes and consequences of conflicts remain just as relevant today as in the past. On the one hand, conflicts are associated with state-building (e.g. stronger governments with better institutions) (Morris, 2014; Tilly, 1985) and opportunities for technological innovations during the country's postwar re-building phase (Olson, 1982; Organski and Kugler, 1977). On the other hand, conflicts are also associated with adverse effects on society welfare. Conflicts not only contribute to poverty, disinvestment and disease outbreaks, but also increase widespread inequality and lower human capital (Koubi, 2005; Thies and Baum, 2020). In turn, these same factors (poverty, economic and social inequalities, and/or weak institutions) carry the risk of an increase in, or protraction of, conflicts where countries often find themselves caught in a conflict trap (Collier and Sambanis, 2002; Collier et al., 2009; Michalopoulos and Papaioannou, 2016).

While international wars since World War 2 have been on the decline over the years (Pinker, 2011; Thies and Baum, 2020), the world has also experienced a shift from interstate to intrastate conflicts. These intrastate conflicts have been characterised by between group violence (e.g. ethnic or religious conflicts), civil conflicts involving the state and militia rebels, or civilian uprisings (e.g. riots or protests involving violence) (Thies and Baum, 2020).

Analysing how conflicts respond to economic and social factors has been the focus of much research (Collier and Hoeffler, 1998, 2004; Fearon and Laitin, 2003; Hegre and Sambanis, 2006; Collier et al., 2009). However, with the shift from interstate to more intrastate conflicts, we find limited evidence in the literature that distinguishes between the effects of conflict determinants on conflicts by type of actor (i.e. aggressor), namely state and non state-based.¹ We argue that the treatment of conflict determinants' effects as homogeneous across intrastate conflicts can result in misleading conclusions, particularly as the actors behind, and hence nature of, the intrastate conflicts may be heterogeneous. Therefore, the objective of this study is to compare the effects of social and economic determinants that are associated with intrastate conflicts by actor types. We are particularly interested in the aggressors behind the conflicts and so concentrate our study on three main types of actors: state and non-state, with non-state split into groups and civilians.

¹Non state-based include groups or communities that have taken it upon themselves to fill the roles of services not provided by the government for their society. For example, citizens can turn to vigilantes as they try to protect their neighbourhoods, such as villagers who try to protect their children from Boko Haram in Nigeria (Nel, 2020).

Using panel data analysis for 46 African countries from 1997 to 2017, and a comprehensive geo-referenced Armed Conflict Location and Event Data (ACLED), we find that military expenditure decreases civilian-based conflicts, but can be a cause for state-based conflicts. Globalisation increases both state and civilian-based conflicts, but reduces group-based conflicts. Population density decreases all three types of conflict, while income per capita increases conflicts irrespective of actor type. Additional analysis reveals further evidence of heterogeneous effects at a regional level. Military expenditure decreases state-based conflicts in the North, Central and West African regions, but increases the same type of conflict in the South region. Globalisation increases civilian-based conflicts in most regions, except the North. On the other hand, we find limited variation in the effects of determinants on group-based conflicts across the regions.

Intrastate conflicts are abundant in Africa with 26% of all reported incidences in the world occurring on the continent during the period 1997 to 2017. Of these intrastate conflicts, the African continent accounts for 53% of non state-based conflicts and 40% of one-sided (typically involving civilians) compared to other regions.² Figures 1 and 2 further show the breakdown of intrastate conflicts by type and related number of deaths within Africa. In both figures, we also include total conflict and total number of deaths based on the summation of the three conflict types. We observe that there has been a significant increase in overall conflicts and related deaths in the last decade. In particular, we observe in Figure 1 that both group and civilian-based conflicts have been on the rise and contributing to overall episodes of conflicts in Africa. The number of deaths related to group conflicts in Figure 2 have also been the main contributor to overall deaths. The continent therefore provides an interesting testing ground for exploring our hypothesis on the heterogeneity of determinants' effects on conflicts by actor types.

Of concern is the persistence of group-based conflicts and the increasing trend of civilian-based conflicts. Current intrastate conflicts have been typically related to natural resources, ethnic and religious differences, which can be driven by groups or civilians. For example, the Rwandan genocide in 1994, the Angolan civil war between 1975 and 2002, the Sierra Leone 'diamonds' civil conflict between 1991 and 2002, and the Nigerian Boko Haram insurgencies which began in 2009. Africa has also been affected by violent civilian uprisings, such as the farm invasions by war veterans in

²Calculations were done by the authors using the Uppsala Conflict Data Program (UCDP) ([Sundberg and Melander, 2013](#)).

Zimbabwe which took place during the 2000s,³ and the 2010 Arab Spring against oppressive regimes in the North African region. Despite attempts by governments and international organisations⁴ to combat conflict, Africa remains a high conflict area with repeated episodes of violence (Collier and Hoeffler, 2002; Miguel et al., 2004; Arezki and Gylfason, 2013). At the same time, progress in achieving sustainable economic development in Africa continues to be delayed in comparison to other global regions (IMF, 2019), undermined especially by conflicts.

These trends necessitate further exploration in understanding the dynamics associated with intrastate conflicts in Africa, in particular what may mitigate one conflict type may drive another. If we acknowledge that the nature of conflicts has evolved over time, then we also need to acknowledge that the responses of these conflicts to the economic and social factors may also have changed. Updating our preconceived notions of how determinants should affect conflicts can be a step in finding appropriate resolutions to mitigating intrastate conflicts and expediting economic development in Africa.

2 Data and Methodology

The empirical model borrows from the frameworks of Collier and Hoeffler (1998) on the economic causes of civil conflicts (that is, the greed and grievance model) and Fearon and Laitin (2003) on the feasibility of conflicts. Collier and Hoeffler (1998) argue that conflicts occur if the incentives are large enough relative to the costs. These incentives are driven by grievances and opportunities (the greed aspect). According to Collier and Hoeffler (2004), grievances in the form of political repressions, ethnic and religious differences can be severe enough to start a rebellion. Similarly, instances that generate profitable opportunities through looting can be worth the conflict. For example, the returns from natural resources are a high enough incentive for some countries to incur the costs of conflict (such as, the diamond-financed conflict in Sierra Leone and oil conflict in the Niger Delta). On the other hand, Fearon and Laitin (2003) argue that greed and grievances may not necessarily be the driving factors for conflicts, but rather the conditions that favour conflicts (i.e. is it feasible to go to war?). These conditions typically can include military capacity of the state to defeat rebel insurgencies, external funding to finance the rebels, or where potential fighters

³<https://www.politicsweb.co.za/opinion/mugabe-and-farm-murders-in-zimbabwe>.

⁴These include the United Nations and African Union peacekeeping operations.

forego very little income in choosing rebellion over the state. However, while [Fearon and Laitin \(2003\)](#) and [Collier and Hoeffler \(1998\)](#), among others, use a measure for civil war onset, duration and occurrence, we deviate from this framework by treating conflict as a collection of actors or aggressors, namely the state (i.e. government), groups and civilians. By examining the conflict by actor types, we can compare if the same factors that determine government-related conflicts also determine group and civilian-based conflicts.

The conflict data is from the Armed Conflict Location and Event Data project (ACLED) which reports individual conflict "events" ([Raleigh et al., 2010](#)). We use the data specific to 46 African countries during the period 1997-2017. We choose the ACLED database because it provides more detailed records of conflict episodes in Africa, particularly the group and civilian violence. Conflict is defined as an event when an aggressor uses lethal force against another group or civilians. ACLED uses geo-referenced micro dataset that records multiple conflict "events" each year for a given country. Each recorded "event" is classified into actor types which refers to the individual organisations or groups that are involved in the conflict: 1) state-based (recognised Governments or related parties), 2) group-based (militias and rebel groups), and 3) civilian action (protesters/rioters).

Governments are defined by ACLED as "internationally recognised regimes in assumed control of a state" and includes related parties such as military, police forces, and security forces. Groups include organisations that identify or organise with a particular political, community, ethnic, or religious ideology. These can include rebel groups (defined by ACLED as "political organisations whose goal is to counter an established national governing regime by violent acts") and militias ("armed and violent groups created for a specific political agenda" or that "organise around ethnic, religion or livelihood issues" and usually operate on behalf of political elites). Civilian action includes rioters who participate in "violent demonstrations and/or spontaneous acts of disorganised violence" and protesters who are usually "peaceful, unarmed demonstrators". We add the individual "events" across actor type to create a total sum of events by actor type, country, and year.

While the data is at a micro-level, we make the unit of analysis country-year level because our argument is best captured by an analysis that looks at how a country's overall level of resources or level of openness may act as triggers for different actors involved in the conflict. Some country-level factors can reinforce micro-level factors (e.g. globalisation may reinforce horizontal and vertical

inequalities which can lead to civilian-based violence through riots,⁵ or a country with a powerful military force may make conflicts unfeasible for rebel groups). We aim to provide an alternative view of conflict that emphasises the importance of re-evaluating causes of conflicts based on actor types because these actors may be driven by different triggers.

We compare economic, social, and political determinants to analyse the effects across the three different actor types. We base our choice of determinants on the greed, grievance and feasibility frameworks discussed above (Collier and Hoeffler, 1998; Fearon and Laitin, 2003). We briefly present the variables and expected signs here but a more detailed discussion of the variables and mechanisms follows in the Results section.

The determinants related to grievances include real income per capita at 2010 constant prices, state fragility and globalisation. We expect income per capita to be negatively associated with conflicts because higher income per capita increases the opportunity costs of engaging in conflicts (Fearon and Laitin, 2003). The political variable, from the Center for Systemic Peace, is the state fragility index which scores each country on both effectiveness and legitimacy in four performance dimensions: security, political, economic and social. The index measures a country's ability to fulfill basic functions, such as manage conflict, make and implement public policy, deliver public services, respond effectively to challenges and crises and sustain progressive development. The index ranges from 0 (no fragility) to 25 (extreme fragility). We expect countries with poor political institutions to be engaged in more conflicts (Fearon and Laitin, 2003). We also include a globalisation index for openness compiled by Dreher (2006) and updated by Dreher et al. (2008). The globalisation index combines three key components of globalisation (political, economic and social globalisation) into a weighted index ranging from 0 (no globalisation) to 100 (highly globalised). The index captures international flows of goods, capital, businesses, people, technology, information and the presence of international organisations. The association between globalisation and conflicts is not as apparent in the literature. Globalisation can create conditions that increase grievances (Bezemer and Jong-A-Pin, 2013), but can also facilitate growth promoting conditions, such as migration of skilled labour to developing countries (Hegre et al., 2010).

⁵The xenophobic attacks on foreigners in South Africa have been mainly driven by aggrieved locals who believe that foreigners are 'taking away' their jobs.

For the greed motivation, we include natural resource rents as a percentage of GDP. We expect profit-seeking behaviour from natural resources rents to increase conflicts (Collier and Hoeffler, 2004). Finally, the determinants related to feasibility of conflict include military expenditure as a percentage of GDP, and population density measured as people per square kilometre of land area. We expect increased military expenditure to decrease conflicts by reducing the likelihood of rebel success (Hoeffler and Collier, 2006). We also expect large populations to increase conflicts as they facilitate rebel recruitments (Fearon and Laitin, 2003). All variables are obtained from the World Development Indicators except the state fragility and globalisation index.

Determinants of conflict have traditionally been estimated using Ordinary Least Squares (OLS), binary limited dependent variable models such as a probit or logit (Collier and Hoeffler, 1998, 2004; Fearon and Laitin, 2003), or proportional hazard model to analyse conflict duration (Collier et al., 2004; Rouen and Sobek, 2004). Our conflict variable is a summation of the number of events in a country per year. This measure is a non-negative discrete integer, usually referred to as a count dependent variable in the literature, which means a suitable estimator to use would be a count model.⁶ Count data can often be skewed and therefore not normally distributed making methods such as OLS not the most appropriate estimator to use. Wooldridge (2010) notes that OLS is not ideal since $E(V_{ijt}|X)$ can be negative even when V_{ijt} , the count of the number of events, is non-negative. Therefore, applying the least squares regressions on count outcome variables may lead to inconsistent estimates in the presence of skewed data. Count models, such as negative binomial or poisson, are more suited to estimating regressions with a count dependent variable as they have been designed to deal with the skewness and sparsity of the data, and the heteroskedasticity of regression errors (Raleigh, 2014; Beardsley et al., 2019). These models also attenuate the issue of dealing with zero-outcome variables which are common in count data (Correia et al., 2019).

The model is defined as:

$$E[V_{it}|x_{it}, \phi_i] = \phi_i \delta_t \exp(\beta x_{i,t-1})$$

where V_{it} is the count of events for country i in year t , $x_{i,t-1}$ is a vector of lagged determinants of conflict described above, and ϕ_i and δ_t are unobserved country and year heterogeneity.

⁶We estimated the model using OLS with fixed effects and the results are available upon request. The conclusions remain unchanged but we do lose significance on several variables.

We estimate a Poisson pseudo-likelihood regression with multi-way fixed effects which is particularly useful in models of panel data with positive count dependent variables (Verdier, 2018; Correia et al., 2019).⁷ The fixed effects allow for unobserved differences across countries, such as education policies, health policies, access to technology or geographic locations. The year effects take into account time differences, such as years of onset of conflicts in different countries. The fixed effects model also assumes statistical endogeneity between the regressors and error term. Since potential bias may also be present in the model through reverse causality, we estimate a model with lagged explanatory variables to minimise the issue. The lagged terms also allow us to model a delay in the responsiveness of conflicts to changes in the determinants during the period under review.

3 Results

3.1 Baseline analysis

In Table 1, we report results for the full sample of countries. We observe that income per capita and population density have homogeneous effects across the conflict types. Income per capita increases conflict while population density decreases conflict regardless of who the actor type is. We also find that the effect on civilian-based conflicts from income per capita is relatively larger in comparison to the other conflict types. A one percent increase in income per capita is associated with a 2.2% increase in civilian-based conflicts and a 1.1% and 1.3% increase in state and group-based conflicts, respectively.

The results for income per capita are contrary to evidence in the literature that finds a negative correlation (Collier and Hoeffler, 2004; Abu-Bader and Ianchovichina, 2018). According to Dabla-Norris et al. (2015), the efficiency of economic growth in reducing poverty can be lower in countries with high initial levels of inequality, or in countries with redistributive patterns that are not favourable for the poor. These grievances associated with rising incomes in poor countries can increase the feasibility of conflicts. For example, economic growth in Africa has not always translated into more equal distribution of income within African countries (Anyanwu, 2011; Chancel et al., 2019). Evidence by Chancel et al. (2019) finds that average incomes of the top 10% are about 30 times higher

⁷We conducted the Hausman specification test and rejected the null hypothesis for no correlation between the error term and regressors, which suggested that the fixed effects estimator was more appropriate than the random effects.

than the bottom 50% in Africa, compared to 20 times higher in other extreme inequality regions, such as Latin America and the Middle East. These persistent income gaps, consequences also from Africa's historical legacy of colonialism (e.g. land grabs and extraction of natural resources), give rise to grievances that can result in civil unrest among the disenfranchised population or marginalised ethnic groups (Michalopoulos and Papaioannou, 2016; Gleditsch, 2007). For example, Zimbabwe's agrarian reform to redress land inequality led to state level violence, while the high unequal benefits from resource rents have seen conflicts break out in Sierra Leone, Angola and Nigeria.

Rising incomes per capita can also increase the chances for rebellion victory (Collier and Sambanis, 2002; Fearon and Laitin, 2003). Rebel groups require funding and an aggrieved society to mobilise. As such, widening horizontal economic inequalities can fuel group and civilian conflicts (Stewart, 2002; Raleigh, 2014). For example, Heslin (2021) and Rudolfson (2021) argue that changes in food access related to price increases can interact with existing grievances and motivate collective violence. Furthermore, Collier and Hoeffler (2002) and Fearon and Laitin (2003) find that poverty facilitates recruitment of civilians for rebel groups as income opportunities worsen within the formal labour market. The government, by default, becomes involved to restore law and order thus increasing conflict occurrences caused by income issues.

Population density, on the other hand, decreases all three conflict types, with larger effects on state-based conflicts. A one percent increase in population density decreases state-based conflicts by 12% in comparison to 2.5% and 4% for group and civilian-based conflicts. The negative effect is consistent with Herbst (2000)'s hypothesis that countries with highly concentrated populations have lower risks of conflict because of military feasibility. A dispersed population makes it challenging for the government forces to defend the territory (Raleigh and Hegre, 2009) and for the militia groups to coordinate activities. There is also strength in numbers so civilians in low population density areas become more vulnerable to attacks. According to (Herbst, 2000), the Democratic Republic of Congo (DRC) is prone to rebellion because its population live around the edges of the country where the state has limited reach.

We find heterogeneity in the effects of military expenditure, globalisation and state fragility across the conflict types. We find that military expenditure decreases civilian and group-based conflicts, but increases state-based conflicts. The results are statistically significant for civilian-based conflicts

with larger effects. A one unit increase in military expenditure is associated with a decrease of 19% in civilian-based conflicts. Despite the statistically insignificant results for group and state-based conflicts, the different coefficient signs suggest that military expenditure is more effective in reducing civil type actions. The gains to rebellion become less with increasing military expenditure (Collier and Hoeffler, 1998). Since national security falls under government responsibility, and a fair number of the conflicts in Africa are instigated by rebel groups (for example, Boko Haram, the Rwandan genocide) or by dissatisfied civilians (for example, the Arab spring), it is plausible that an increased military expenditure can be perceived as a show of strength which dissuades instigators from engaging in conflict. Moreover, governments that face military threat also tend to increase fiscal capacity in order to improve chances of winning conflict, whether it be spending on warfare machinery or human capital to mobilise population (Aghion et al., 2019).

Globalisation is positively and significantly correlated with state and civilian-based conflicts. A unit increase in globalisation is associated with an increase of 7% for civilian-based conflicts and just under 8% for state-based conflicts. According to Olzak (2011) and Bezemer and Jong-A-Pin (2013), globalisation creates grievance conditions that increase income inequality and poverty. For example, Autor et al. (2015) argues that the technological progress and expanding trade from globalisation has resulted in income inequality and employment polarisation. He finds negative effects of import competition on employment and earnings in trade-exposed local labour markets (Autor et al., 2015; Acemoglu et al., 2016). Moreover, the economic costs of exogenous shocks from globalisation in societies that already have social divisions and weak institutions are magnified by the conflicts that are triggered (Rodrik, 1998).

When we separate the globalisation index into its sub-indices, economic, social and political openness, in Table 2, we find that social globalisation⁸ drives the state and group-based conflicts, with a relatively larger magnitude for state-based conflicts. The positive effects for the group-based conflicts may be as a result of rebel groups taking advantage of the social issues mentioned above, such as civilians protesting over poor service delivery, autocratic regimes, or increased migrants, to push through their anti-government agendas. Political globalisation⁹ drives the positive effects for

⁸Social globalisation accounts for tourism, the percentage of foreign population in countries, media use, and presence of multinational corporations.

⁹Political globalisation accounts for the number of embassies in the country, membership in international organisations, participation in United Nations (UN) security council missions and number of international treaties.

civilian-based conflicts. Unfortunately, in Africa, several ceasefires have failed to prevail resulting in a recurrence of violence. For example, the Lusaka Accords (1994) in Angola or the four peace agreements that were ineffective in curbing the violence in the Democratic Republic of Congo.¹⁰ Interestingly, economic globalisation¹¹ is negatively and significantly associated with group-based conflicts. As the gains from trade increase and improve the country's wealth, the decrease in grievances related to economic inequality can lower the incentives of civilians to protest which may pose a feasibility challenge to rebel groups (Collier et al., 2009).

Fragile states are institutionally weak and therefore more susceptible to conflict (Fearon and Laitin, 2003) as indicated by the positive association, more so with group-based conflicts. A unit change in state fragility index increases group-based conflicts by 3.7%. We also separate the index into its sub-indices, state effectiveness (ability to provide for population and control violence) and state legitimacy (acceptance of rule by the population), in Table 2. We observe that state legitimacy contributes more to group-based conflicts, while state effectiveness contributes more to state-based conflicts. Fragile states usually indicate a loss of legitimacy and confidence in the governing authority. This can lead to increased violence from the authorities as they try to maintain their power through oppression of citizens. According to Rouen and Sobek (2004), weak institutions can be incapable of restraining rebel groups or protesting civilians. People accept state authority so long as the state upholds its social contract with citizens to deliver public services that are conducive to economic development, such as employment (Stewart, 2002). Our results show that a lack of faith or conviction held by the population in a state's ability to address vertical or horizontal inequalities can increase the feasibility of group-based conflicts. Rebel groups can take the opportunity to use aggrieved citizens to advance their political agenda. Examples include the Fulani extremism in Nigeria.

We find no significant effects with resource rents which is surprising given the prolific evidence in the literature of the natural resource curse in Africa. The African continent's vast resources have long been a source of contention leading to conflict (Fearon and Laitin, 2003; Collier and Hoeffler, 2004; Barbieri and Reuveny, 2005). Resource rents provide motivation and opportunities for governments

¹⁰The Lusaka Ceasefire Agreement (1999), the Sun City Agreement (2002), the Pretoria Agreement (2002) and the Luanda Agreement (2002).

¹¹Economic globalisation accounts for trade of goods and foreign direct investments.

and disgruntled groups to support themselves through expropriation, particularly when it comes to control of state power.

3.2 Results by Regions

Conflicts not only have regional economic spillovers through increased military budget or deterioration of the reputation of the region in relation to foreign investments, but they also incur social spillovers through refugee flows (Collier et al., 2003). Moreover Bosker and de Ree (2014) and Gleditsch (2007) provide evidence that a conflict is not determined just by a country's internal factors, but also by the transnational factors and linkages between countries (for example, shared ethnic ties, foreign interventions, or the executive constraints of political leaders in regions). As additional analysis, we split our sample of countries by regions as classified by the World Bank.¹² We maintain the same hypothesis that the determinants may have heterogeneous effects across the conflicts by actor types in the regions. Table 3 reports the results for state-based conflicts, Table 4 for group-based conflicts and Table 5 for civilian-based conflicts.

In Table 3, we find evidence of different effects from military expenditure, globalisation, population density and state fragility. We observe that the negative effects of military expenditure on state-based conflicts are negative and statistically significant in the North, Central and West regions, with larger effects in the North and West regions. On the other hand, increasing military expenditure increases conflicts in the South region. While increased military expenditure can decrease conflicts by reducing rebels' success of victory, high military expenditure can also act as a signal to rebels of the government's intentions which can lead to renewed conflicts (Hoeffler and Collier, 2006). Military expenditure can also increase state-based conflicts as a channel of rebel finance from hostile governments. For example, some governments are willing to finance military opposition to the incumbent government which can lead to increased state-based conflicts (Collier and Hoeffler, 2004). Some examples include militarised interventions from neighbouring countries, such as Angola, Namibia and Zimbabwe providing troops to the DRC government during its' civil war, or the government of Zimbabwe bank-rolling the Renamo rebellion in Mozambique (Collier and Hoeffler, 2004).

¹²The regional classifications can be found in the Appendix.

Globalisation increases state-based conflicts in the South region, but has the opposite effect in the East region. Globalisation has benefited countries by promoting economic growth through trade, information and technology transfers, and the migration of people. These factors encourage peaceful relationships amongst countries and decrease the likelihood of conflict (Blanton and Apodaca, 2007; Choi, 2010; Flaten and de Soysa, 2012; Hegre et al., 2010). The East region has embarked on extensive publicity campaigns to improve the image of the region with Kenya, Tanzania, Uganda and Rwanda at the forefront (Calderwood and Soshkin, 2019). On the other hand, rising grievances over the influx of migrants in South Africa has seen increased attacks on foreign migrants. According to Rodrik (1997, 2012), though globalisation may have enabled wealth in economies, it has also created social instability by causing tensions between the market and society, such as labour wage differentials, with insufficient social and political support from those globalisation is supposed to help.

Population density significantly decreases state-based conflicts in the North, South and East regions. The West region however has contrary results with population density increasing state-based conflicts. These findings are in line with the population pressure hypothesis that larger populations put strain on scarce resources such as food, land, jobs, or infrastructure increasing the risk of conflict (Barbieri and Reuveny, 2005; Fearon and Laitin, 2003). As such, governments may find large populations relatively difficult to sustain, which can increase the risk of conflict (Gleditsch, 1998). Moreover, larger populations increase the conditions that favour insurgencies by increasing chances of rebel recruitment (Fearon and Laitin, 2003; Raleigh and Hegre, 2009). Densely populated areas, as found in Nigeria for example, also indicate availability of resources which armed actors can loot or target for taxing (Beardsley and McQuinn, 2009; Sanchez de La Sierra, 2020), provide lower transaction costs for coordination, and supply access to citizens to use as increased collateral against the state (Raleigh and Hegre, 2009).

State fragility increases state-based conflicts in all the regions, except the East region. International organisations, such as The USAID/East Africa-Funded Peace in the East region, have been instrumental in addressing cross-border conflict issues affecting local and regional peace, and stability in the Horn of Africa, with emphasis on border areas that include Kenya, Uganda, Sudan, Somalia, and Ethiopia.¹³ Resource rents decrease state-based conflicts in the South region. This effect is

¹³<https://www.dai.com/our-work/projects/africa-conflict-prevention-mitigation-and-response-progr>

most likely through the leaders' increased opportunity costs of losing control over the resources if they engage in conflict. The positive association with income per capita is mostly in line with our previous findings.

Table 4 reports the results for group conflicts by regions. Military expenditure is statistically significant and negatively associated with group conflicts in the North and Central regions, again with larger effects in the North region. The ongoing insurgency in the Maghreb regions of the North since 2002, as well as the conflicts in North Kivu of the DRC and the Central African Republic have seen the states invest heavily in deployment of military to counter the rebel groups, thus reducing the feasibility of conflict. Globalisation is significant in decreasing group conflicts in the West and East regions. Globalisation has also seen an increase in arms trade between states suggesting that military technology options available to rebel groups may be limited compared to the state ([Grossman, 1995](#)).

Population density decreases group conflicts in the South, Central and East regions. As population becomes more concentrated in a small area, conflict decreases most likely due to the numbers being too large for rebel groups to infiltrate or control. State fragility increases group conflicts in the Central and West regions which is expected given the Boko Haram insurgency that began in Nigeria and spilled over into neighbouring countries Niger, Cameroon and Chad. Income per capita increases group conflicts for all regions except the East region. We find no significant effects from natural resource rents on group conflicts.

In Table 5, we show the results for civilian-based conflicts by regions. Military expenditure is negatively and significantly associated with conflict in the West region, but increases the same type of conflict in the East region. Income per capita has positive associations with civilian-based conflicts in the North, West and East regions. Globalisation reduces civilian-based conflict in the North region, but increases it in the South, Central and East regions. Population density decreases civilian-based conflicts in the South region, but increases the same type of conflict in the Central region. State fragility decreases civilian-based conflicts in the North and Central regions. We also find no significant effect from resource rents across the regions, except in the East region with a negative association. We believe similar mechanisms that we discussed previously apply for the

ams-east-and-southern.

effects of determinants on civilian-based conflicts.

3.3 Robustness analysis

Countries that have experienced a conflict have a higher risk of war recurrence than the risk of a new conflict starting in countries with no history of conflicts (Collier and Sambanis, 2002; Walter, 2011; Gates et al., 2016). We allow for this persistence of conflicts by including the lags of the conflict variables in the regressions. The dynamic specification not only accounts for time-varying unobserved heterogeneity, but also minimises endogeneity issues.¹⁴ We find that the inclusion of the lagged dependent does not attenuate the effects of the determinants and the overall conclusions in Table 6 remain relatively consistent with those drawn from Table 1.¹⁵ We also observe that the coefficients of the lagged dependent variables are relatively smaller than the main determinants suggesting that past conflicts may not necessarily explain present conflicts. Walter (2004) provides evidence that conflict recurrences have less to do with characteristics of previous conflicts and more to do with citizens' current incentives to engage in violence.

The presence of cross-sectional dependence is also possible through the spatial effects of conflicts.¹⁶ For example, the Rwandan genocide in 1994 drove many citizens to seek refuge in neighbouring countries, mainly the DRC and Burundi. The 1998 civil war in the DRC spilled over the borders into Burundi. The civil war in Liberia spilled over to Sierra Leone. The Ivory Coast crisis in 2010 saw many of its citizens crossing over into Liberia for safety. The recent political instability in Zimbabwe forced thousands of citizens to find better livelihoods in South Africa. As a robustness check, we use the Pesaran (2006) Common Correlated Effects Mean Group estimator which allows for heterogeneous slope coefficients and correlation across countries (cross-section dependence). The overall conclusions drawn from the mean group results in Table 7 do not differ greatly from the fixed effects estimates, though we lose significance.

¹⁴We also have results with a two-step GMM estimation used for count models and nonnegative outcome variables in the Appendix, Table A6. The overall conclusions drawn from the results remain relatively consistent with the fixed effects model.

¹⁵The results for dynamic regressions by regions can be found in the Appendix, Tables A3-A5. The results are robust to the inclusion of the lagged dependent variables.

¹⁶We tested for cross-sectional dependence and rejected the null hypothesis for cross section independence, suggesting that conflict was correlated across countries.

4 Conclusion

This paper highlights variations in the effects of determinants on three actor types of conflicts in Africa, namely state, group and civilian-based. We find evidence of heterogeneous effects for military expenditure, globalisation, population density and state fragility, more so at a regional level compared to the full sample. Income per capita has consistent positive effects with all three actor types irrespective of regions, while we find no significant effects with resource rents. These findings that determinants can be unique to conflicts based on type of actor, particularly across regions in Africa, should not be dismissed. Interestingly, while there appears to be more variations in the effects of each determinant on state-based and civilian-based conflicts across regions, we find that the different determinants have relatively similar effects on group-based conflicts across the different regions.

The implications of these findings can be twofold. First, it is easier for rebel groups to move across borders and infiltrate neighbouring countries, for example the Islamic State (ISIS), Boko Haram and other radical groups, whereas state-based conflicts are usually contained to intra-state type conflicts, such as state vs rebel groups within borders or state vs civilians. Second, group-based conflicts tend to be similar in nature (i.e. tactical strategies - infiltrate, recruit, spread ideology, and/or use civilians as collateral to gain bargaining advantage with the state). As such, policies targeting group-based conflicts may require the involvement of all African regions with a single mandate to deter rebels. Economic and social policies that reduce horizontal inequalities and strengthen state institutions are necessary to reduce the feasibility of conflict for rebels. Enrichment by conflicts becomes more attractive where alternative opportunities are few (i.e. low incomes, limited employment) increasing the likelihood of violence. On the other hand, policies targeting state-based and civilian-based conflicts should be more region specific. A recent example was the intervention of armed forces from the Economic Community of West African States (ECOWAS) countries to remove President Jammeh of the Gambia from office after his opponent defeated him at the elections, which prevented a nationwide strife. The findings also highlight the importance of economic blocs, such as ECOWAS, South African Development Community (SADC), or the African Union (AU) in encouraging rapport and good relations between nations so as to assist in mitigating conflicts on the continent.

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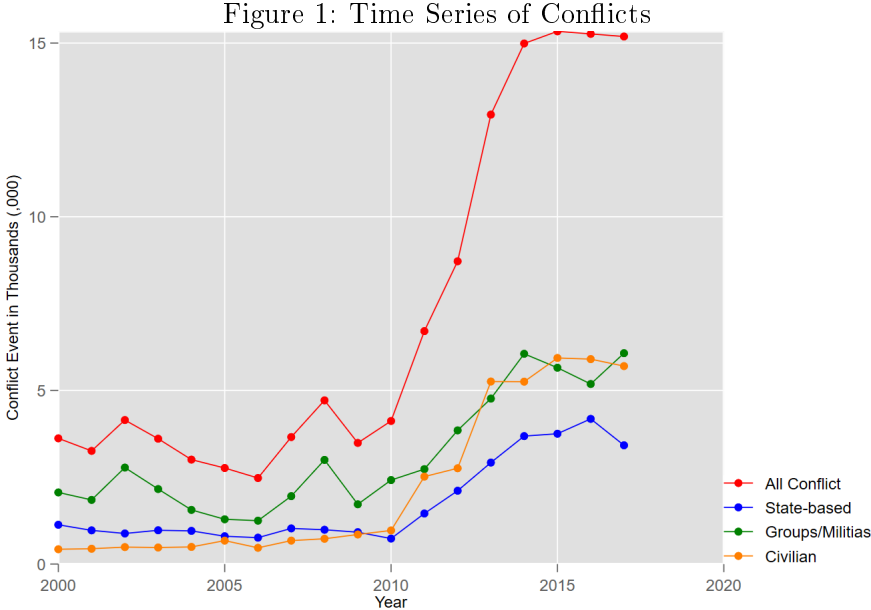
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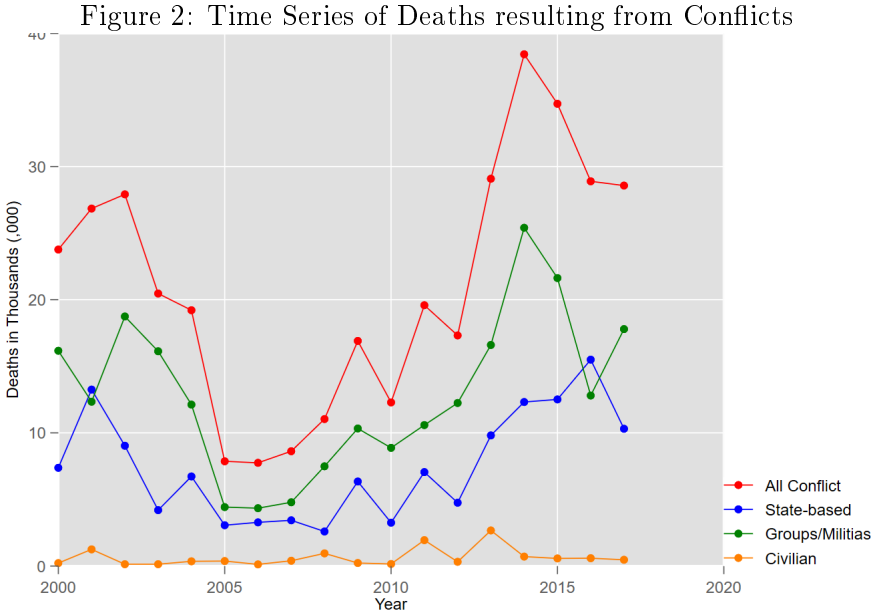
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Figures & Tables



Note: The figure shows a times series of conflicts (total and types) in Africa during the period 2000 and 2017. Source: ACLED.



Note: The figure shows a times series of deaths resulting from conflicts (total and types) in Africa during the period 2000 and 2017. Source: ACLED.

Table 1: Conflict types

	Government	Group	Civilian
Military Expenditure _(t-1)	0.021 (0.045)	-0.079 (0.061)	-0.191** (0.086)
ln(Real PCGDP _(t-1))	1.118** (0.522)	1.317*** (0.485)	2.267*** (0.536)
Globalisation _(t-1)	0.079* (0.045)	-0.046 (0.037)	0.073** (0.033)
Resource rents _(t-1)	-0.022 (0.015)	-0.004 (0.009)	-0.012 (0.010)
Ln(Pop. Density _(t-1))	-12.107*** (2.035)	-2.486* (1.347)	-4.072*** (0.970)
State Fragility _(t-1)	0.023 (0.014)	0.038*** (0.011)	-0.021 (0.019)
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
LogLik	-10111.727	-11773.707	-8074.638
Pseudo-R2	0.664	0.735	0.843
Obs	741	741	741

Coefficients reported. Robust standard errors in parentheses. * $p < .10$, ** $p < .05$,

*** $p < .01$.

Table 2: Globalisation and state fragility sub-indices

	Government	Group	Civilian
Military Expenditure _(t-1)	0.045 (0.042)	-0.083 (0.063)	-0.206** (0.093)
ln(Real PCGDP _(t-1))	1.028* (0.559)	0.904* (0.496)	2.274*** (0.489)
Economic Globalisation _(t-1)	0.016 (0.020)	-0.044** (0.017)	0.015 (0.017)
Social Globalisation _(t-1)	0.128*** (0.045)	0.062** (0.031)	0.015 (0.028)
Political Globalisation _(t-1)	0.028 (0.024)	-0.002 (0.013)	0.038** (0.017)
Resource rents _(t-1)	-0.018 (0.018)	0.016 (0.011)	-0.009 (0.011)
Ln(Pop. Density _(t-1))	-12.144*** (2.126)	-2.217 (1.441)	-4.291*** (1.125)
State effectiveness _(t-1)	0.021** (0.011)	0.012 (0.008)	-0.013 (0.012)
State legitimacy _(t-1)	0.013 (0.009)	0.026*** (0.008)	-0.009 (0.012)
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
LogLik	-9782.383	-11218.811	-8038.282
Pseudo-R2	0.673	0.746	0.843
Obs	734	734	734

Coefficients reported. Robust standard errors in parentheses. * $p < .10$, ** $p < .05$,

*** $p < .01$.

Table 3: State-based Conflicts by Regions

	North	South	Central	West	East
Military Expenditure _(t-1)	-1.222*** (0.161)	0.144*** (0.048)	-0.291** (0.134)	-0.815** (0.340)	0.003 (0.074)
ln(Real PCGDP _(t-1))	-2.711 (4.289)	3.607*** (1.389)	2.511** (1.229)	2.460** (1.000)	1.105 (0.739)
Globalisation _(t-1)	-0.115 (0.074)	0.164** (0.068)	-0.098 (0.097)	0.025 (0.061)	-0.074* (0.038)
Resource rents _(t-1)	-0.019 (0.038)	-0.050** (0.023)	-0.017 (0.020)	-0.013 (0.012)	0.011 (0.021)
Ln(Pop. Density _(t-1))	-11.315** (4.914)	-21.573*** (5.072)	5.034 (6.355)	8.626* (5.049)	-18.829*** (5.281)
State Fragility _(t-1)	0.052** (0.026)	0.095** (0.040)	0.064** (0.027)	0.070*** (0.021)	-0.052*** (0.014)
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
LogLik	-481.092	-1194.331	-787.420	-926.164	-1325.565
Pseudo-R2	0.904	0.864	0.832	0.786	0.754
Obs	101	182	106	205	147

Coefficients reported. Robust standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$.

Table 4: Group-based Conflicts by Regions

	North	South	Central	West	East
Military Expenditure _(t-1)	-1.404*** (0.169)	0.027 (0.040)	-0.305** (0.144)	-0.200 (0.434)	-0.107 (0.067)
ln(Real PCGDP _(t-1))	9.931*** (3.833)	2.510** (1.052)	2.924* (1.523)	1.616* (0.889)	-0.026 (0.796)
Globalisation _(t-1)	0.042 (0.076)	0.075 (0.076)	-0.032 (0.095)	-0.154*** (0.059)	-0.091** (0.042)
Resource rents _(t-1)	-0.100 (0.063)	-0.006 (0.032)	-0.010 (0.018)	0.003 (0.015)	-0.012 (0.021)
Ln(Pop. Density _(t-1))	-0.917 (7.156)	-9.854*** (3.320)	-17.004* (8.968)	0.821 (7.056)	-26.031*** (2.906)
State Fragility _(t-1)	-0.051 (0.032)	0.008 (0.037)	0.123*** (0.031)	0.065*** (0.021)	0.020 (0.013)
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
LogLik	-451.162	-1649.451	-1561.216	-2067.111	-1390.418
Pseudo-R2	0.882	0.751	0.847	0.835	0.826
Obs	101	182	106	205	147

Coefficients reported. Robust standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$.

Table 5: Civilian-based Conflicts by Regions

	North	South	Central	West	East
Military Expenditure _(t-1)	-0.106 (0.139)	0.026 (0.051)	0.018 (0.115)	-0.366* (0.218)	0.231** (0.091)
ln(Real PCGDP _(t-1))	15.157*** (4.312)	1.223 (0.873)	-2.894 (1.882)	1.369** (0.623)	3.449*** (0.856)
Globalisation _(t-1)	-0.134** (0.063)	0.096*** (0.032)	0.104* (0.059)	-0.058 (0.040)	0.252*** (0.073)
Resource rents _(t-1)	0.053 (0.037)	-0.017 (0.018)	0.006 (0.021)	0.010 (0.011)	-0.123*** (0.034)
Ln(Pop. Density _(t-1))	6.768 (4.546)	-7.790*** (1.392)	8.349* (5.056)	5.205 (3.517)	2.535 (5.115)
State Fragility _(t-1)	-0.131*** (0.024)	0.011 (0.016)	-0.056* (0.033)	0.011 (0.016)	-0.022 (0.016)
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
LogLik	-1187.843	-939.529	-460.471	-1026.919	-1113.133
Pseudo-R2	0.907	0.944	0.864	0.884	0.808
Obs	101	182	106	205	147

Coefficients reported. Robust standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$.

Table 6: Dynamic - Conflict types

	Government	Group	Civilian
Military Expenditure _(t-1)	-0.198*** (0.069)	-0.074* (0.044)	-0.169* (0.089)
ln(Real PCGDP _(t-1))	1.146** (0.530)	0.638 (0.454)	2.212*** (0.528)
Globalisation _(t-1)	0.035 (0.029)	0.005 (0.024)	0.075** (0.032)
Resource rents _(t-1)	-0.008 (0.012)	-0.003 (0.008)	-0.010 (0.010)
Ln(Pop. Density _(t-1))	-8.303*** (1.458)	-3.087** (1.228)	-3.021*** (1.112)
State Fragility _(t-1)	0.005 (0.013)	0.023*** (0.009)	-0.025 (0.019)
Gvt_conflict _(t-1)	0.004*** (0.001)		
Group_conflict _(t-1)		0.002*** (0.000)	
Civ_conflict _(t-1)			0.000* (0.000)
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
LogLik	-8266.217	-10144.543	-7965.808
Pseudo-R2	0.725	0.771	0.845
Obs	741	741	741

Coefficients reported. Robust standard errors in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$

Table 7: Mean Group - Conflict types

	Government	Group	Civilian
Military Expenditure _(t-1)	329.548 (200.660)	-274.047 (167.018)	128.652 (176.146)
ln(Real PCGDP) _(t-1)	3.171 (22.433)	77.463** (37.291)	13.507 (49.477)
Globalisation _(t-1)	-20.793 (39.885)	-39.867 (44.707)	-97.802 (61.332)
Resource rents _(t-1)	-61.129* (34.089)	-20.354 (67.931)	49.661* (28.885)
ln(Pop. Density) _(t-1)	-40.499 (35.784)	-29.461 (47.386)	38.882 (43.429)
State Fragility _(t-1)	1.740 (21.646)	63.547 (46.221)	-27.724 (25.870)
Country FE	Yes	Yes	Yes
Obs	768	768	768

Coefficients reported. Robust standard errors in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$

Appendix A

Table A1: Descriptive Statistics

	Obs	Mean	Std.Dev.	Min.	Max.
All_conflict	1134	121.48	288.35	0.00	2578.00
Gvt_conflict	1134	30.80	103.34	0.00	1272.00
Group_conflict	1134	54.45	143.16	0.00	1174.00
Civ_conflict	1134	36.23	119.59	0.00	1815.00
Military Expenditure	872	2.19	2.80	0.00	39.61
GDP per capita (constant 2010 US)	1012	2286.30	3082.50	186.66	20333.94
Globalisation	988	46.94	9.82	22.70	70.03
Resource Rents	982	13.52	14.04	0.00	89.17
Population density (people per sq. km of land area)	1055	83.17	110.71	2.14	622.40
State Fragility	1020	14.65	5.16	0.00	25.00

Sources: Armed Conflict Location and Event Data project, World Development Indicators, Center for Systemic Peace.

Table A2: Country List by Regions

North	South	Central	West	East
Algeria	Angola	Burundi	Benin	Eritrea
Egypt, Arab Rep.	Botswana	Cameroon	Burkina Faso	Ethiopia
Libya	Lesotho	Central African Republic	Cote d'Ivoire	Kenya
Mauritania	Mozambique	Chad	Gambia	Madagascar
Morocco	Malawi	Congo, Rep.	Ghana	Rwanda
Tunisia	Namibia	Congo, Democratic Rep.	Guinea	Somalia
	Swaziland	Gabon	Guinea-Bissau	Sudan
	South Africa	Equatorial Guinea	Mali	Tanzania
	Zambia		Niger	Uganda
	Zimbabwe		Nigeria	
			Senegal	
			Sierra Leone	
			Togo	

Each column represents a region in Africa specified by the World Bank.

Table A3: Dynamic - State-based Conflicts by Regions

	North	South	Central	West	East
Military Expenditure _(t-1)	-1.211*** (0.203)	0.021 (0.096)	-0.281** (0.136)	-0.388 (0.310)	-0.004 (0.067)
ln(Real PCGDP _(t-1))	-2.523 (4.908)	4.330*** (1.571)	2.659** (1.305)	2.584*** (0.981)	0.919 (0.694)
Globalisation _(t-1)	-0.113 (0.069)	0.106 (0.074)	-0.096 (0.099)	0.030 (0.056)	-0.040 (0.044)
Resource rents _(t-1)	-0.018 (0.042)	-0.040* (0.022)	-0.019 (0.018)	0.031** (0.015)	0.008 (0.020)
Ln(Pop. Density _(t-1))	-11.239** (4.934)	-20.617*** (5.008)	4.471 (6.284)	8.475* (4.862)	-16.585*** (6.171)
State Fragility _(t-1)	0.051* (0.027)	0.092** (0.042)	0.057* (0.031)	0.057*** (0.018)	-0.041*** (0.015)
Gvt_conflict _(t-1)	0.000 (0.001)	0.002 (0.002)	0.001 (0.003)	0.009*** (0.002)	0.003 (0.002)
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
LogLik	-481.067	-1168.892	-785.926	-819.757	-1272.244
Pseudo-R2	0.904	0.867	0.832	0.810	0.764
Obs	101	182	106	205	147

Coefficients reported. Robust standard errors in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$

Table A4: Dynamic - Group-based Conflicts by Regions

	North	South	Central	West	East
Military Expenditure _(t-1)	-1.360*** (0.301)	-0.125*** (0.047)	-0.272* (0.143)	0.302 (0.225)	-0.102 (0.063)
ln(Real PCGDP _(t-1))	10.472** (4.838)	2.397*** (0.804)	3.613** (1.450)	1.523** (0.742)	-0.337 (0.775)
Globalisation _(t-1)	0.041 (0.076)	0.113** (0.053)	-0.035 (0.091)	-0.015 (0.049)	-0.065 (0.043)
Resource rents _(t-1)	-0.097 (0.064)	0.041* (0.023)	-0.028 (0.017)	0.053*** (0.015)	-0.006 (0.021)
Ln(Pop. Density _(t-1))	-0.720 (7.604)	-4.141 (2.919)	-14.831* (8.102)	6.665 (4.426)	-23.936*** (3.442)
State Fragility _(t-1)	-0.054* (0.031)	0.030 (0.032)	0.079** (0.036)	0.063*** (0.014)	0.020 (0.012)
Group_conflict _(t-1)	0.000 (0.002)	0.008*** (0.002)	0.002* (0.001)	0.006*** (0.001)	0.001 (0.001)
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
LogLik	-450.995	-1296.132	-1511.031	-1544.193	-1350.304
Pseudo-R2	0.882	0.804	0.852	0.877	0.831
Obs	101	182	106	205	147

Coefficients reported. Robust standard errors in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$

Table A5: Dynamic - Civilian-based Conflicts by Regions

	North	South	Central	West	East
Military Expenditure _(t-1)	0.037 (0.122)	0.040 (0.051)	-0.033 (0.121)	-0.108 (0.232)	0.172** (0.086)
ln(Real PCGDP _(t-1))	20.550*** (4.043)	0.845 (0.795)	-7.044*** (2.036)	1.523** (0.608)	3.287*** (0.790)
Globalisation _(t-1)	-0.129** (0.061)	0.092*** (0.033)	0.133** (0.055)	-0.034 (0.041)	0.230*** (0.063)
Resource rents _(t-1)	0.076** (0.031)	-0.014 (0.019)	0.040** (0.020)	0.027** (0.012)	-0.104*** (0.035)
Ln(Pop. Density _(t-1))	9.470** (3.982)	-5.568*** (1.822)	19.529*** (5.345)	3.902 (3.448)	5.942 (5.274)
State Fragility _(t-1)	-0.152*** (0.024)	0.007 (0.016)	0.064** (0.031)	0.004 (0.016)	-0.017 (0.017)
Civ_conflict _(t-1)	0.001*** (0.000)	0.000* (0.000)	-0.008*** (0.002)	0.002*** (0.001)	0.004** (0.001)
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
LogLik	-956.112	-927.166	-373.824	-988.077	-1063.202
Pseudo-R2	0.925	0.945	0.890	0.888	0.817
Obs	101	182	106	205	147

Coefficients reported. Robust standard errors in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$

Table A6: GMM Instrumental Variables - Conflict types

	Government	Group	Civilian
Military Expenditure _(t-1)	6.783 (4.844)	4.397 (3.425)	-5.086 (13.827)
ln(Real PCGDP) _(t-1)	-0.031 (0.275)	0.061 (0.172)	0.108 (0.166)
Globalisation _(t-1)	8.956*** (3.087)	5.983** (2.909)	16.601*** (3.450)
Resource rents _(t-1)	-0.872 (1.816)	-1.375 (1.151)	0.451 (1.391)
Ln(Pop. Density) _(t-1)	0.233 (0.185)	0.089 (0.151)	-0.011 (0.154)
State Fragility _(t-1)	6.477*** (1.244)	5.649*** (1.056)	4.278*** (1.212)
Gvt_conflict _(t-1)	0.002*** (0.001)		
Group_conflict _(t-1)		0.004*** (0.001)	
Civ_conflict _(t-1)			0.002*** (0.000)
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Obs	652	652	652

Coefficients reported. Standard errors in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$