

# Conflict Heterogeneity in Africa

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## Introduction

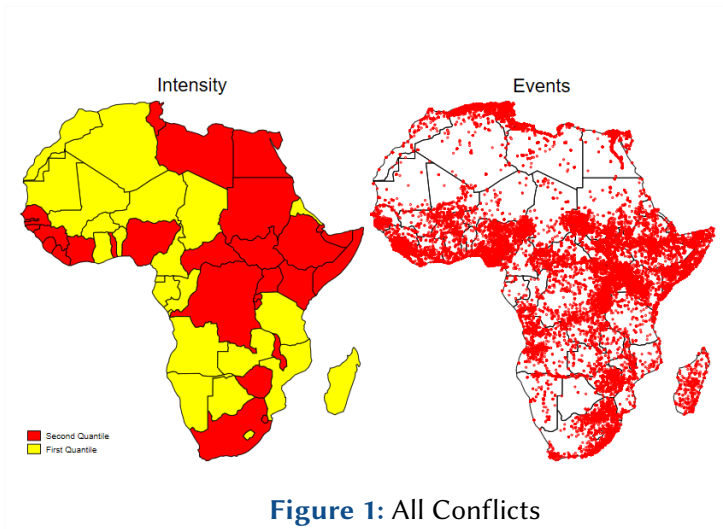
- Conflict is a problem that transcends economic, social and political lines.
- Conflicts impact negatively on lives, physical infrastructure, human capital, economic sectors and alters political institutions. e.g. Arab Spring, Boko Haram crisis, ISIL, genocides.

## Introduction

- Adverse consequences of previous conflicts also persist to the present day delaying growth and achievement of SDGs. e.g. Rwanda genocide, independence wars.
- Spill over effects into neighbouring countries. e.g. Sierra Leone-Guinea-Liberia. Rwanda-Burundi-the DRC. Zimbabwe-South Africa.
- Understanding the nature of conflict should be an important focus in economic growth and development.

## Research Objective

- Existing literature highlights gaps in the conflict debate:
  - analysing it as a single phenomenon (Blattman & Miguel (2010))
  - treating conflict effects as homogeneous across regions / countries (Collier & Hoeffler (1998, 2004), Fearon & Laitin (2003), Hegre & Sambanis (2006), Miguel et al. (2004))

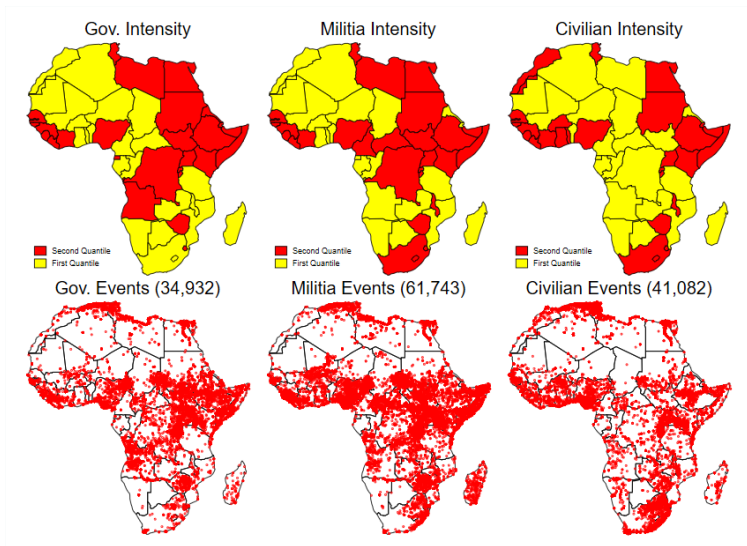


## Research Objective

- This oversight in most of the literature guides the basis of our study:
  - to identify the countries in Africa that are most affected by conflicts,
  - the types of conflict dominating these countries,
  - the likely determinants contributing to the different types of conflicts.

## Research Objective

- Disaggregate conflict into state-based, non state-based, civilian-based.
- Group countries according to intensity of each type of conflict
- The disaggregations allow us to identify the type of conflict contributing to overall conflict, the countries most affected by which type of conflict.



**Figure 2:** Types of Conflict



## Results Preview

- 1 We find evidence of heterogeneity across the conflict types through income per capita, education and population density.
- 2 Globalisation, military expenditure, resource rents and state fragility however have similar positive effects across conflict types, regardless of intensity of conflict.
- 3 Results suggest that there are nuances in the nature of conflict that policymakers must be aware of when adopting policy reforms.

## Definition of Conflict

- The Armed Conflict and Event Data project (ACLED) defines conflict as an event when an aggressor uses lethal force against another.
- We aggregate to a count of the number of "events" in a country in a year and disaggregate the events by aggressor type:
  - State-based (government)
  - Non state-based (militias and rebel groups)
  - Civilian-based
- Intensity groupings are created using the number of each type of event over the entire period and dividing by the country's geographic size.

## Definition of Conflict

- Intensity groupings are created using the number of each type of event over the entire period and dividing by the country's geographic size.
- We use two groupings where for example lowest quantile in the state-based conflicts represents countries with less than 50% occurrences and vice versa.

## Determinants

- Economic determinants (Collier & Hoeffler (2002, 2004), Fearon & Laitin (2003), Hegre et al. (2010), Olzak 2011)) - income per capita, military expenditure, natural resource rents (World Development Indicators), and globalisation (Dreher et al. (2008).
- Social determinants (Collier & Hoeffler (2004), Reynal-Querol (2002)) - primary education, population density (World Development Indicators)
- Political determinants (Fearon & Laitin 2003, Rouen & Sobek 2004, Olzak 2011) - state fragility index (Center for Systemic Peace)

## Methodology

- We use the negative binomial model to estimate the following equation:



$$E[V_{ijt} | \mathbf{x}_{it}, \phi_i, \epsilon_{itj}] = \exp(\gamma + \beta \mathbf{x}_{it} + \epsilon_{itj})$$

- where  $V_{ijt}$  is the count of events per land size area for country  $i$ , conflict type  $j$ , and year  $t$ ,  $\mathbf{x}_{it}$  is a vector of determinants of conflict, and  $\epsilon_{itj}$  is unobserved heterogeneity.

**Table 1: Results**

	Governments/Related Parties		Groups/Militia		Civilians/Protests	
	LQ	HQ	LQ	HQ	LQ	HQ
main						
ln(Military Exp.)	0.488* (0.261)	0.490*** (0.165)	0.220 (0.151)	0.890*** (0.152)	1.048*** (0.233)	0.288 (0.211)
ln(Real PCGDP)	0.461** (0.226)	-0.286 (0.205)	-0.123 (0.176)	-0.096 (0.198)	-1.135*** (0.180)	0.471*** (0.151)
ln(Globalisation)	0.241 (1.055)	3.152*** (0.912)	3.136*** (0.766)	4.640*** (0.884)	5.139*** (0.983)	4.714*** (0.714)
ln(Resource Rents)	0.518*** (0.161)	0.968*** (0.130)	0.304*** (0.113)	0.655*** (0.142)	0.705*** (0.135)	0.706*** (0.106)
ln(Primary Educ.)	0.405 (0.517)	-0.590 (0.466)	1.727*** (0.412)	-1.038** (0.506)	1.971*** (0.692)	0.444 (0.432)
ln(Pop. Density)	-0.092 (0.143)	0.036 (0.138)	-0.251** (0.114)	0.086 (0.105)	-0.089 (0.125)	0.131 (0.237)
ln(State Frag.)	0.844 (0.648)	0.728* (0.427)	2.594*** (0.377)	2.327*** (0.380)	-0.160 (0.484)	0.473 (0.387)
LogLik	-852.195	-1217.789	-867.757	-1521.117	-812.517	-1473.021
Pseudo-R2	0.064	0.033	0.085	0.030	0.090	0.064
Obs	355.000	309.000	320.000	344.000	286.000	378.000

Robust Standard errors in parentheses. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

**Table 2: Non-linearity**

	Governments/Related Parties		Groups/Militias		Civilians/Protests	
	LQ Sq.	HQ Sq.	LQ Sq.	HQ Sq.	LQ Sq.	HQ Sq.
main						
ln(Military Exp.)	0.218 (0.322)	0.507** (0.201)	-0.661*** (0.239)	0.036 (0.218)	1.337*** (0.486)	0.158 (0.233)
ln(Military Exp.) Sq.	0.386 (0.254)	-0.168* (0.100)	0.133 (0.100)	0.358** (0.149)	-0.508** (0.203)	-0.284* (0.145)
ln(Real PCGDP)	-1.748 (2.496)	-3.984* (2.239)	7.711*** (1.957)	0.322 (1.687)	-13.081*** (2.699)	-4.238*** (1.617)
ln(Real PCGDP) Sq.	0.123 (0.174)	0.279* (0.163)	-0.515*** (0.134)	-0.042 (0.116)	0.844*** (0.185)	0.308*** (0.112)
ln(Globalisation)	-100.226*** (20.653)	-44.679*** (14.261)	-34.128** (14.836)	-87.145*** (13.865)	-126.559*** (25.185)	-36.498*** (13.348)
ln(Globalisation) Sq.	13.151*** (2.751)	6.502*** (1.920)	4.876** (1.985)	12.428*** (1.838)	17.939*** (3.343)	5.698*** (1.744)
Ln(Pop. Density)	2.093*** (0.531)	1.548* (0.817)	3.260*** (0.677)	-0.284 (0.678)	-0.161 (0.774)	-1.882 (2.033)
ln(Pop. Density) Sq.	-0.390*** (0.090)	-0.217** (0.098)	-0.682*** (0.115)	-0.005 (0.091)	0.094 (0.165)	0.173 (0.238)
LogLik	-817.241	-1181.423	-842.691	-1469.642	-778.934	-1448.528
Pseudo-R2	0.102	0.062	0.111	0.063	0.127	0.079
Obs	355.000	309.000	320.000	344.000	286.000	378.000

Robust Standard errors in parentheses. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ . Non-linearity was not present in state fragility, resource rents and education.

### Table 3: Additional results

	Governments/Related Parties				Groups/Militias				Civilians/Protests			
	LQ	HQ	LQ	HQ	LQ	HQ	LQ	HQ	LQ	HQ	LQ	HQ
main												
ln_econglob	-2.999*** (0.680)	-0.739 (0.477)			-0.074 (0.722)	-0.531 (0.405)			0.038 (0.621)	-1.526*** (0.460)		
ln_socialglob	0.298 (0.697)	-1.784*** (0.529)			-1.074 (0.705)	-1.083** (0.448)			-0.470 (0.644)	1.708*** (0.544)		
ln_politicalglob	2.714*** (0.681)	3.199*** (0.421)			4.882*** (0.728)	3.789*** (0.313)			4.658*** (0.792)	3.272*** (0.273)		
ln_effectn			-1.089 (0.678)	-1.648*** (0.583)			0.882* (0.518)	-0.036 (0.497)			-1.410** (0.612)	-1.896*** (0.411)
ln_legitn			0.788** (0.351)	1.935*** (0.398)			1.408*** (0.308)	2.077*** (0.337)			0.819** (0.342)	1.712*** (0.299)
LogLik	-829.847	-1166.920	-849.454	-1209.538	-821.279	-1488.533	-867.721	-1515.245	-781.825	-1420.598	-807.948	-1458.842
Pseudo-R2	0.088	0.061	0.050	0.039	0.121	0.051	0.065	0.034	0.115	0.097	0.073	0.073
Obs	355.000	303.000	336.000	309.000	314.000	344.000	301.000	344.000	280.000	378.000	267.000	378.000

Robust Standard errors in parentheses. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ . Initial determinants included in regressions. Other variables included are ruggedness, initial wealth 1950, distance to nearest coast, distance to nearest slave trade routes, colonial origin.



## Discussion: Results

- Homogeneous positive effects are found through globalisation, resource rents, military expenditure and state fragility.
- Similar non-linearity effects are also present in globalisation across conflict types.

## Discussion: Results

- Heterogeneous effects are found through income per capita which increases civilian-based high intensity conflicts and state-based low intensity conflicts. Inverted non-linearity outcomes more persistent for civilian-based conflicts, regardless of intensity.
- Population density reduces group-based low intensity conflicts. Insignificant for the rest. Non-linearity present across government and group based conflict types.
- Education has no effect on state-based conflicts, but increases group-based and civilian-based conflicts.

## Discussion: Results

- Political globalisation drives positive effects of globalisation on conflict.
- Lack of legitimacy of state powers contribute to the positive effects of state fragility on conflict.
- Other results in paper indicate rugged terrain increases low intensity conflicts across all types.
- Countries with low initial wealth in 1950 have increased conflicts today.