The Robbers Cave: Intergroup Contact and Conflict in Africa

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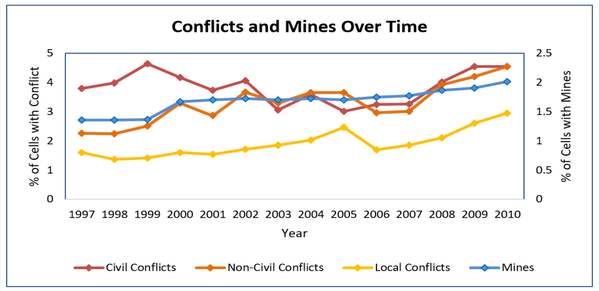
Introduction

- **Conflict**: Economists want to explain why certain countries are plagued by conflict and violence
- Natural resource curse: countries with an abundance of natural resources attain less economic growth, partially because increased conflict is detrimental to the economy
- **Mining**: areas with more mining activity experience more conflict (Berman et al., 2017)
- Historical ethnic borders in Africa are often demarcated poorly, resulting in overlapping claims on resources and conflict
- **Ethnicity**: areas with more historical ethnic borders experience more conflict (Depetris-Chauvin and Ozak, 2019)

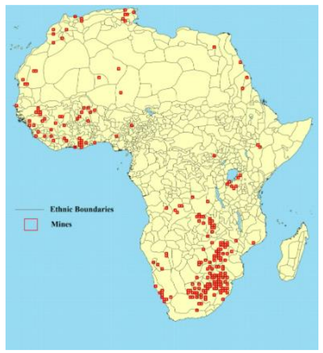


Data Sources

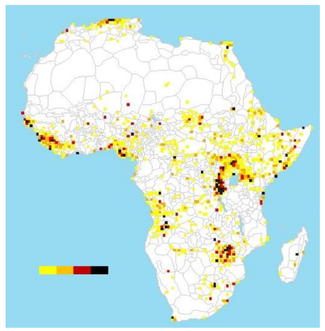
- The unit of observation is a **cell-year**, with panel data on each cell from 1997 to 2010
- Each cell is constructed by dividing the full grid of Africa into subnational units of 0.5×0.5 degrees latitude and longitude using **PRIO-GRID** data
- Conflict is measured using the **ACLED** (The Armed Conflict Location & Event Data) dataset
- Mining information is obtained from the **RMD** (Raw Materials Database) dataset
- The location of historical ethnic boundaries and specific information about African ethnic groups is determined by the **Murdock Ethnographic Map of Africa** (1959) and the **Murdock Ethnographic Atlas** (1967) which does not vary through time
- World prices for minerals are collected from the **World Bank Commodities Prices** dataset, evaluated at 1997 prices
- Political power is measured for each ethnic group using the **Ethnic Power Relations** (EPR) dataset

Map of Africa – Mines, Ethnic, Conflicts

Locations of Mines and Ethnic Boundaries



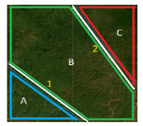
Locations of Conflicts



Examples of Ethnic Boundaries at the Cell

Zero Ethnic Boundaries

One Ethnic Boundary



Two Ethnic Boundaries

Three Ethnic Boundaries

Research Question:

How does interethnic contact in Africa affect conflict as groups compete for political power and access to resources?

- Does this effect change when accounting for heterogeneity between different types of conflict?
- Does this effect change when accounting for heterogeneity between different types of interethnic contact?

Key Findings

- Mining Incidence alone leads to a **6-7% increase** in the probability of conflict
- Oppression incidence alone leads to a **1.4% increase** in the probability of conflict
- A cell-year with both mining incidence and oppression incidence experiences an overall **1.4% decrease** in the probability of conflict (compared to 8% increase without the interaction term)
- A cell-year with both mining incidence and farmer-herder incidence experiences a **3% decrease** in the probability of conflict (compared to 7% increase without the interaction term)
- A cell-year with both mining incidence and ethnic boundary incidence experiences a **2% increase** in the probability of localized conflict (compared to 7% increase without the interaction term)
- Previous literature suggests that both explanatory variables increase conflict when analyzed separately
- However, the coefficients for their interaction term are negative and large enough to significantly reduce the probability of conflict
- This holds true across different types of conflict and different types of interethnic contact

Main Variables

c: Country **i: Cell** **t: Year**

$Conflict_{i,t}$:

- **Dummy variable equal to 1 if at least one conflict event occurs within the cell-year (Conflict Incidence)**
  - **Conflict events that involve the government military or rebels as one of the actors (Civil Conflict Incidence)**
  - **All conflict events that are not civil conflicts (Non-Civil Conflict Incidence)**
  - **Conflict events that only involve geographically and/or ethnically local groups as both of the actors (Localized Conflict Incidence)**
- **Number of conflict events taking place within the cell-year (# Conflicts)**

$Mines_{i,t}$:

- **Dummy variable equal to 1 if at least one active mine is operating in the cell-year (Mining Incidence)**
- **Number of mines operating in the cell-year (# Mines)**

$Ethnic_i$:

- **Dummy variable equal to 1 if the cell-year contains at least one ethnic boundary (Ethnic Boundary Incidence)**
- **Number of ethnic boundaries within the cell-year (# Ethnic Boundaries)**
- **Dummy variable equal to 1 if the cell-year contains at least one dyad where a tribe is dependent on farming and another tribe is dependent on herding (Farmer-Herder Incidence)**
- **Dummy variable equal to 1 if the cell-year contains at least one dyad where a tribe rules alone and another tribe is excluded or a tribe shares power and another tribe is excluded (Oppression Incidence)**

$\alpha_{c,t}$: **Country-Year Fixed Effects**

λ_i: **Time-Invariant Geographic Controls**

$\delta_{i,t}$: **Socioeconomic Controls**

OLS Results: Oppression

Table 2: OLS Regression of Conflict Incidence on Mining Incidence and Oppression Incidence with Country-Year Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)
	Conflict Incidence					
Mining Incidence	0.069*** (0.009)		0.072*** (0.010)	0.062*** (0.009)		0.064*** (0.020)
Oppression Incidence		0.032*** (0.008)	0.033*** (0.008)		0.014* (0.007)	0.016* (0.007)
Mining Incidence × Oppression Incidence			-0.094* (0.048)			-0.094* (0.048)
Geographic Controls	NO	NO	NO	YES	YES	YES
Socioeconomic Controls	NO	NO	NO	YES	YES	YES
N	144580	144676	144580	141149	141245	141149
adj. R^2	0.106	0.105	0.106	0.127	0.126	0.127

Standard errors in parentheses. Standard errors are clustered at the country-year level. Country-year fixed effects are included. Controls include terrain ruggedness, distance to capital city, log precipitation, distance to closest port, past conflicts, log distance to the closest border, gross household income.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

OLS Results: Farmer-Herder

Table 3: OLS Regression of Conflict Incidence on Mining Incidence and Farmer-Herder Incidence with Country-Year Fixed Effects

	(1)	(2)	(3)	(4)
	Conflict Incidence			
Farmer-Herder Incidence	0.020*** (0.005)	0.021*** (0.005)	0.007 (0.004)	0.008 (0.005)
Mining Incidence		0.073*** (0.010)		0.065 *** (0.010)
Farmer-Herder Incidence × Mining Incidence		-0.099 *** (0.024)		-0.103*** (0.025)
Geographic Controls	NO	NO	YES	YES
Socioeconomic Controls	NO	NO	YES	YES
N	144676	144580	141245	141149
adj. R^2	0.105	0.106	0.126	0.127

Standard errors in parentheses. Standard errors are clustered at the country-year level. Country-year fixed effects are included. Controls include terrain ruggedness, distance to capital city, log precipitation, distance to closest port, log distance to the closest border, past conflict, gross household income.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

OLS Results: Types of Conflict

Table 4: OLS Regression of Conflict Incidence on Mining Incidence and Ethnic Boundary Incidence with Country-Year Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)
	Civil Conflict Incidence		Non-Civil Conflict Incidence		Localized Conflict Incidence	
Mining Incidence	0.083*** (0.013)	0.068*** (0.014)	0.082*** (0.013)	0.069*** (0.014)	0.080*** (0.013)	0.071*** (0.014)
Ethnic Boundary Incidence	0.008*** (0.001)	0.002 (0.001)	0.003* (0.001)	-0.002 (0.001)	0.001 (0.001)	-0.001 (0.001)
Mining Incidence × Ethnic Boundary Incidence	-0.067*** (0.014)	-0.052*** (0.015)	-0.045*** (0.012)	-0.033** (0.012)	-0.059*** (0.013)	-0.051*** (0.014)
Geographic Controls	NO	YES	NO	YES	NO	YES
Socioeconomic Controls	NO	YES	NO	YES	NO	YES
N	144580	141149	144580	141149	144580	141149
adj. R^2	0.084	0.105	0.093	0.109	0.059	0.072

Standard errors in parentheses. Standard errors are clustered at the country-year level. Country-year fixed effects are included. Controls include terrain ruggedness, distance to capital city, log precipitation, distance to closest port, past conflicts, log distance to the closest border, gross household income.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

2SLS Results: IV Conflict Incidence

Table 5: 2SLS IV Regression of Conflict Incidence on Mining Incidence and Oppression Incidence with Country-Year Fixed Effects

First Stage	(1) Mining Incidence	(2) Mining Incidence × Oppression Incidence
ln (Price of Main Mineral)	0.056*** (0.001)	
ln (Price of Main Mineral) × Oppression Incidence		0.087*** (0.006)
N	141149	141149
adj. R^2	0.543	0.676
F	234.1	67.16

Second Stage	(1) Conflict Incidence
Mining Incidence	0.081*** (0.006)
Oppression Incidence	0.016*** (0.004)
Mining Incidence × Oppression Incidence	-0.111*** (0.032)
N	141149
adj. R^2	0.127

Standard errors in parentheses. Standard errors are clustered at the country-year level. Country-year fixed effects are included. Controls include terrain ruggedness, distance to capital city, log precipitation, distance to closest port, log distance to the closest border, past conflict, gross household income.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Research Design

- The variable Ethnic_i is exogenous because it was constructed using the Murdock Map from 1959, significantly before the time period of study and it does not vary through time, except for oppression incidence
- The variable $\text{Mines}_{i,t}$ could be endogenous because mines may be forced to close if workplace safety is poor due to the additional risks that armed conflict incurs. There could be other confounding variables.
- Mines are opened if investors expect that minerals will be efficiently and safely extracted.
- Mineral prices $p_{i,t}$ are an instrument for mining activity, since higher prices would entail greater financial rewards.

1) OLS Regression with Country-Year Fixed Effects

$$\text{Conflict}_{i,t} = \alpha_{c,t} + \beta_1 \text{Mines}_{i,t} + \beta_2 \text{Ethnic}_i + \beta_3 (\text{Mines}_{i,t} \times \text{Ethnic}_i) + \beta_4 \lambda_i + \beta_5 \delta_{i,t} + u_{i,t}$$

2) 2SLS IV Regression with Country-Year Fixed Effects

First Stage:

$$\widehat{\text{Mines}}_{i,t} = \alpha_{c,t} + \pi_1 \ln(p_{i,t}) + \pi_2 \text{Ethnic}_i + \pi_3 \lambda_i + \pi_4 \delta_{i,t} + \widehat{\epsilon_{i,t}}$$

Second Stage:

$$\text{Conflict}_{i,t} = \alpha_{c,t} + \beta_1 \widehat{\text{Mines}}_{i,t} + \beta_2 \text{Ethnic}_i + \beta_3 (\widehat{\text{Mines}}_{i,t} \times \text{Ethnic}_i) + \beta_4 \lambda_i + \beta_5 \delta_{i,t} + u_{i,t}$$

Summary Statistics

Table 1: Summary Statistics by Mining Activity

N = 144,594	Mining Activity N = 2,440		No Mining Activity N = 142,154	
	Mean	Std. Dev	Mean	Std. Dev
Panel A: Conflict Variables				
Civil Conflict Incidence	0.083	0.276	0.038	0.190
Non-Civil Conflict Incidence	0.114	0.317	0.032	0.175
Localized Conflict Incidence	0.075	0.263	0.018	0.134
Panel B: Ethnic Variables				
Ethnic Boundary Incidence	0.605	0.489	0.492	0.499
Oppression Incidence	0.029	0.169	0.019	0.137
Farmer-Herder Incidence	0.035	0.184	0.038	0.191

Note: All variables in this table are dummy variables, either equal to 0 or 1.

Explanation

- The arbitrary splitting of national borders in Africa resulted in many people belonging to different ethnic groups being forced to live together in the same country, and people of the same ethnic group split from each other.
- As a result, ethnic identities became more salient, and conflict increased.
- However, mines usually hire people who are residents of the country that the mines are located in.
- People of different ethnicities but same nationalities would work in the same mine.
- They share a superordinate goal of acquiring resources by mining together, which increases cooperation and partially mitigates conflict.

References

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