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Weathering Conflict: The Effect of Resource Shocks on Livestock Raids

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Background

A growing body of research examines the relationship between climate variability and conflict (Hsiang et al., 2011; 2013; Burke et al., 2015; 2024). **Natural resource fluctuations** play a crucial role in shaping violence, particularly in pastoral regions where livelihoods depend on weather conditions (Harari & La Ferrara, 2018). Both negative shocks leading to **resource scarcity** and positive shocks leading to **resource abundance** have been linked to conflict escalation (Salehyan & Hendrix, 2014; Koren & Schon, 2023). The underlying mechanisms involve competition over limited resources and increased returns from violence during periods of abundance (Homer-Dixon, 1994; Collier & Hoeffler, 2004).

Objective

- Analyze how **resource fluctuations effect inter-communal livestock raiding in the same households over time**.
- Assess how a policy intervention to reduce resource variability --- **catastrophic drought insurance ---** influences this relationship.

Data

- We measure conflict as **the seasonal propensity to be raided,** based on a survey question about livestock losses due to raiding, from the **40-season** IBLI panel dataset **of 1,568 pastoral households** in the ASALs in Kenya and Ethiopia.
- We define shocks to resource availability based on **NDVI z-scores** (2000–2023) are computed as the within-region monthly deviation from historical means to measure forage availability; **pasture quality** is defined as bad (<20th percentile), normal (20th–80th), or good (>80th)
- Household data on **insurance coverage, premium discount coupons** and **indemnity payments.**

Estimation Equations

$$\begin{aligned}\text{LossRaid}_{hit} &= \beta_0 + \beta_1(\text{Bad Pasture}_{it}) + \beta_2(\text{Good Pasture}_{it}) \\ &+ \beta_3(\text{Bad Pasture}_{it-1}) + \beta_4(\text{Good Pasture}_{it-1}) \\ &+ \gamma\text{Season}_t + X_{hit} + \mu_h + \epsilon_{hit}\end{aligned}$$

Equation 1: Effect of bad and good pasture shocks on the propensity to be raided, concurrently and lagged.

$$\widehat{\text{Coverage}}_{ht} = \alpha + \beta_1\text{Coupon}_{ht} + \gamma\text{Season}_t + \varepsilon_{h,t}$$

Equation 2: Estimating drought insurance coverage (iterated logit regressions, first stage)

$$\begin{aligned}\text{LossRaid}_{ht} &= \beta_0 + \beta_1\widehat{\text{Coverage}}_{ht} + \beta_2\text{Trigger}_{it} \\ &+ \beta_3\widehat{\text{Coverage x Trigger}}_{ht} + \gamma\text{Season}_t + \mu_h + \varepsilon_{ht}\end{aligned}$$

Equation 3: Effect of drought insurance coverage and indemnity payments on the propensity to be raided (second stage).

Results: Pasture Shocks and Raiding

	All Seasons (1) Raided	Rainy (2) Raided	Dry (3) Raided	All Seasons (4) Raided	Rainy (5) Raided	Dry (6) Raided	All Seasons (7) Raided	Rainy (8) Raided	Dry (9) Raided
Bad Pasture (v Normal Pasture)	0.00363**	0.00370	0.00406**				0.00379**	0.00213	0.00364*
	(0.00153)	(0.00243)	(0.00183)				(0.00154)	(0.00241)	(0.00186)
Good Pasture (v Normal Pasture)	-0.00110	-0.00133	-0.000750				-0.000943	-0.00188	-0.000912
	(0.00118)	(0.00199)	(0.00142)				(0.00118)	(0.00198)	(0.00135)
Bad Pasture Previous Season				-0.00105	-0.00167	-0.000955	-0.000497	0.000195	-0.00120
				(0.00147)	(0.00264)	(0.00184)	(0.00140)	(0.00257)	(0.00175)
Good Pasture Previous Season				0.00335**	0.00856***	-0.00410***	0.00430***	0.0101***	-0.00350**
				(0.00152)	(0.00271)	(0.00145)	(0.00153)	(0.00258)	(0.00141)
N	24752	12015	12737	25582	12825	12757	24752	12015	12737
Mean	0.00554	0.00765	0.00362	0.00610	0.00715	0.00499	0.00549	0.00630	0.00474
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
Seasons	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bitemporal							✓	✓	✓

Standard errors in parentheses. Significance denoted by stars: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

- **Negative pasture shocks** increase the propensity to be raided in **dry seasons**.
- **Positive pasture shocks** increase the propensity to be raided in **subsequent rainy seasons**.

Results: Catastrophic Drought Insurance and Raiding

	Dry Loss due to Raids (1)	Rainy Loss due to Raids (2)	Dry Loss due to Raids (3)	Rainy Loss due to Raids (4)	Dry Loss due to Raids (5)	Rainy Loss due to Raids (6)
Predicted Insurance ($\gamma1$)	-0.016485	-0.021247**			0.003403	-0.035108*
	(0.010479)	(0.009938)			(0.009701)	(0.020922)
Index triggered			0.008105***	0.004559*	0.010937***	0.001771
			(0.002022)	(0.002441)	(0.002644)	(0.003163)
Pred. ins. x index triggered ($\gamma2$)					-0.092249***	0.050356
					(0.034713)	(0.039584)
Coef: ($\gamma1 + \gamma2$)					-0.088846	0.015248
p-value: ($\gamma1 + \gamma2$)					*0.009863*	*0.660232*
Household f.e.'s	✓	✓	✓	✓	✓	✓
Season controls	✓	✓	✓	✓	✓	✓
Control Mean Losses due to Raid	0.004682	0.008895	0.004682	0.008743	0.004682	0.008743
Observations	14311	14166	14310	9265	14310	9265

Standard errors in parentheses. Significance denoted by stars: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. In a classic IV setup: Olea-Pflueger F-stat of 2870, critical value is 16.38.

- Insurance decreases the propensity to be raided for insured households
  - In rainy seasons, through *ex-ante* behavioural effects
  - In dry seasons, through *ex-post* indemnity payments.

Results: Insurance by pasture shocks

- Drought insurance **decreases** the propensity to be raided through *ex-post* indemnity payouts during bad pasture dry seasons (p<0.05)
- Drought insurance **increases** the propensity to be raided for insured households during good pasture rainy seasons (p < 0.01)

Conclusions

- Novel evidence of the effect of resource variability on conflict in the same households over time.
- The dual role of resource fluctuations implies different mechanisms required to understand them and different potential (policy) solutions.
- Insurance, on average, reduces conflict, but there is heterogeneity.
- Insurance increases raiding during good pasture rainy seasons.
- This suggests a need for research and potentially for complementary interventions

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