ECON 3510: Poverty and Economic Development
Lecture 15: Conflict

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Dube and Vargas (2013)

- How do income shocks affect civil conflict?
- Ambiguous! Two competing effects.
- **Opportunity cost effect:** A rise in income may *reduce* conflict by increasing wages and reducing labor supplied to criminal or conflict activity.
- **Rapacity effect:** More income means there is more to fight over. A rise in income may *increase* conflict by raising the return to predation and promoting rapacity over these resources.

Which Effect Dominates?

- A key determinant: **labor intensity** of production subject to shocks.
- Think about fluctuations in commodity prices.
- High labor intensity industries (e.g., agricultural commodities): Positive price shocks increase wages and divert labor away from conflict. The *opportunity cost effect* dominates.
- Low labor intensity industries (e.g., natural resources): The wage effects of price increases are limited, but the production becomes more profitable. The *rapacity effect* dominates.

Colombian Internal Conflict

- Dube and Vargas (2013) test this idea in the context of Colombia.
- The Colombian internal conflict started in the 1960s. It involved 3 sets of actors.
  - Colombian government
  - Left-wing guerrillas
  - Right-wing paramilitaries
- The conflict remained low intensity throughout the 1980s but escalated sharply during the 1990s.
- Armed groups appropriate resources through several avenues.
  - Cocaine trade, as well as kidnapping, extortion, and predation on public funds.
  - Appropriation of government revenue in places where paramilitaries exert influence.
  - Direct theft of natural resources.
- Both the guerrillas and the paramilitaries recruit from the ranks of rural workers. The need for employment reportedly played an important role in the decision to join armed groups.

Coffee and Oil

- Dube and Vargas (2013) look at price shocks to coffee and oil. Colombia is a leading producer of coffee, but not oil.

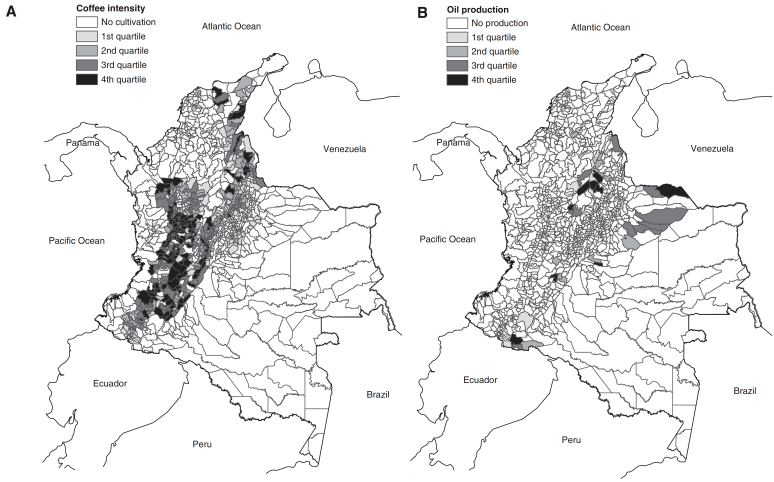


FIGURE 1
Coffee intensity and oil production in Colombia. (A) Coffee intensity; (B) Oil production

Research Design

- Difference-in-differences (slightly simplified):

$$y_{jrt} = \alpha_j + \beta_t + \delta_r t + (\text{Coca}_{jr} t)\gamma + (\text{Oil}_{jr} \times \text{OP}_t)\lambda + (\text{Cof}_{jr} \times \text{CP}_t)\rho + \mathbf{X}_{jrt}\phi + \varepsilon_{jrt}.$$

- y_{jrt}: conflict outcomes including the number of guerrilla attacks, paramilitary attacks, clashes or casualties in municipality j, region r, and year t.

- α_j = municipality FE; β_t = year FE; $\delta_r t$ = region-specific linear trends.

  $\text{Coca}_{jr} t$ = linear trends associated with Coca production; $\mathbf{X}_{jrt}$ = time-varying controls.

- Oil_{jr} = oil production level (hundred thousand barrels/day); OP_t = international oil price.
  - OP_t can be seen as exogenous as Colombia can't influence the international price.

- Cof_{jr} = land devoted to coffee production (thousands of hectares); CP_t = internal coffee price.
  - CP_t may be endogenous. It is instrumented by export volumes of other major coffee producers.

- Intuitively, compare trends in conflict between municipalities when prices fluctuate.

Conflict 1988–2005

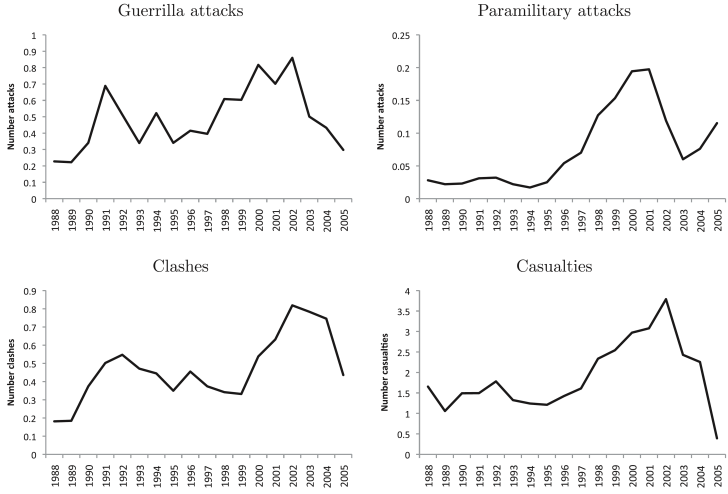
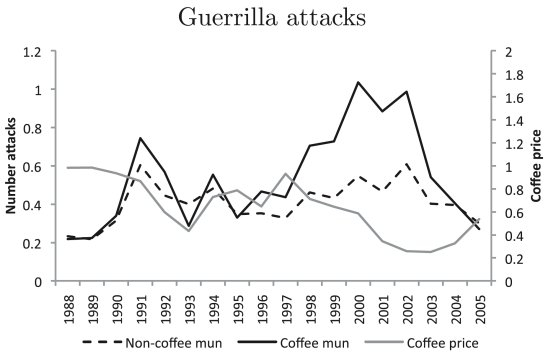


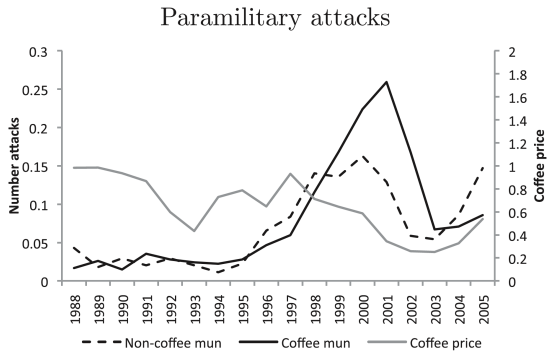
FIGURE 3

Mean violence in Colombian municipalities, 1988–2005

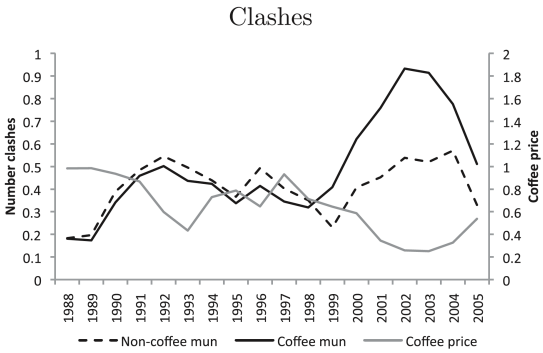
- Guerrillas active since the early 1990s, while paramilitaries active since the late 1990s.

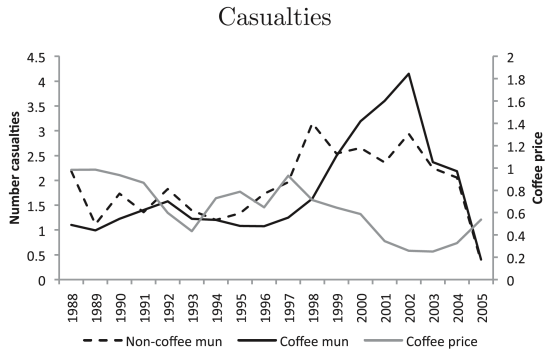
Coffee Price and Conflict



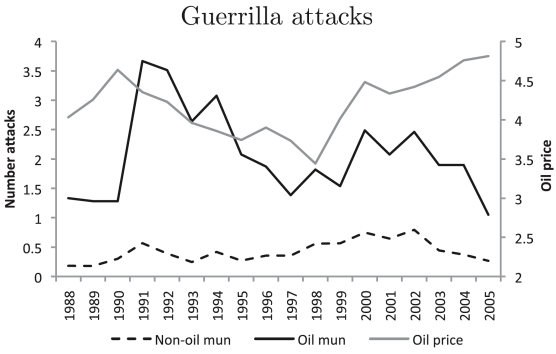


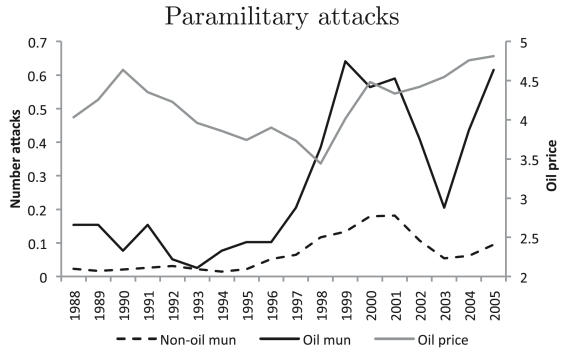
Coffee Price and Conflict (Cont'd)





Oil Price and Conflict





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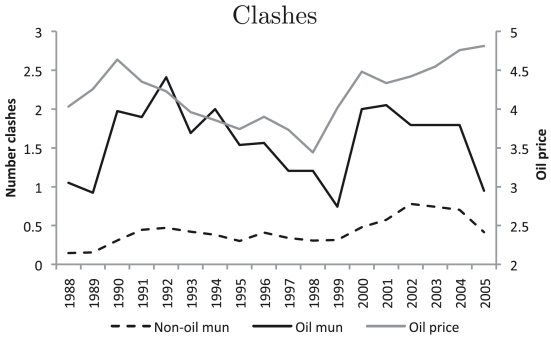

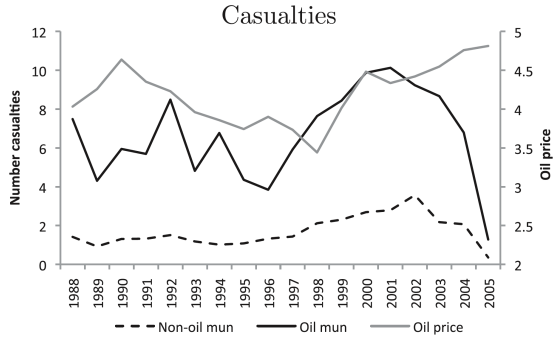

Commodity Prices and Conflict: DiD Results

TABLE 2
The effect of the coffee and oil shocks on violence

Dependent variables	(1) Guerrilla attacks	(2) Paramilitary attacks	(3) Clashes	(4) Casualties
Coffee int. x log coffee price	−0.611**	−0.160***	−0.712***	−1.828*
	(0.249)	(0.061)	(0.246)	(0.987)
Oil production x log oil price	0.700	0.726***	0.304	1.526
	(1.356)	(0.156)	(0.663)	(2.127)
Observations	17,604	17,604	17,604	17,604

Notes: Standard errors clustered at the department level are shown in parentheses. Variables not shown include municipality fixed effects, year fixed effects, log of population, and linear trends by region and municipalities cultivating coca in 1994. The interaction of the internal coffee price with coffee intensity is instrumented by the interaction of the coffee export volume of Brazil, Vietnam, and Indonesia with rainfall, temperature, and the product of rainfall and temperature.
*** is significant at the 1% level; ** is significant at the 5% level; * is significant at the 10% level

Opportunity Cost and Rapacity Effects

TABLE 3

The opportunity cost and rapacity mechanisms

	(1)	(2)	(3)	(4)	(5)
	Opportunity cost mechanism			Rapacity mechanism	
Dependent variables	Log wage	Log hours	Log capital revenue	Paramilitary political kidnappings	Guerrilla political kidnappings
Coffee int. x log coffee price	0.371*	0.286**	−0.787	0.022	−0.060
	(0.217)	(0.125)	(0.698)	(0.014)	(0.060)
Oil production x log oil price	1.230	0.079	0.419**	0.168***	−0.066
	(0.894)	(0.314)	(0.203)	(0.009)	(0.206)
Observations	26,050	57,743	11,559	16,626	16,626
Sample period	1998–2005	1998–2005	1988–2005	1988–2004	1988–2004

Notes: Standard errors clustered at the department level are shown in parentheses. In column (1), the dependent variable is the log of hourly wage, defined as the the individuals' earnings in the past month divided by hours of employment in the past month. In column (2), log hours refers to hours of employment during the past month. Variables not shown in all specifications include municipality fixed effects, year fixed effects, and linear trends by region and municipalities cultivating coca in 1994. Columns (1) and (2) also control for education, age, age squared, and indicators of gender and marital status. Columns (3)–(5) additionally control for log population. The interaction of the internal coffee price with coffee intensity is instrumented by the interaction of the coffee export volume of Brazil, Vietnam, and Indonesia with rainfall, temperature, and the product of rainfall and temperature.

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Alternative Explanations

TABLE 4
Alternative accounts

	(1)	(2)	(3)	(4)
Panel A: Migration, enforcement and paramilitary protection				
Dependent variables	Migrant	Government attacks	Paramilitary massacres	Guerrilla massacres
Coffee int. × log coffee price	0.144	−0.089**	−0.116**	−0.012
	(0.096)	(0.040)	(0.055)	(0.015)
Oil production × log oil price	−14.381	0.011	0.122**	0.026
	(13.073)	(0.255)	(0.050)	(0.043)
Observations	33,313	17,604	17,604	17,604
Panel B: Political collusion				
Dependent variables	Guerrilla attacks	Paramilitary attacks	Clashes	Casualties
Coffee int. × log coffee price	−0.328**	−0.153***	−0.691***	−1.549**
	(0.152)	(0.036)	(0.241)	(0.751)
Oil production × log oil price	1.004	0.755***	−0.130	1.259
	(1.441)	(0.130)	(0.873)	(2.225)
Years pro-para majority × oil production × log oil price	0.939	1.018	0.834	10.103
	(1.872)	(0.831)	(2.510)	(15.369)
Years pro-para majority × log oil price	0.028	−0.001	0.048*	0.162*
	(0.021)	(0.006)	(0.028)	(0.093)
Observations	11,736	11,736	11,736	11,736

- Col (3) & (4): not about government-paramilitary cooperation.

Accounting for Coca

TABLE 5
Accounting for coca

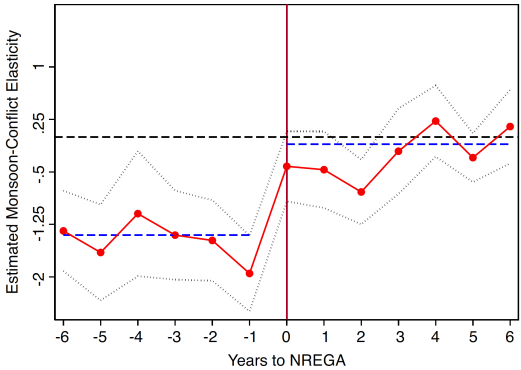
Dependent variables	(1) Coca	(2) Guerrilla attacks	(3) Paramilitary attacks	(4) Clashes	(5) Casualties
Panel A: Testing the coca substitution hypothesis					
Coffee int. × log coffee price	0.072	−0.082	−0.097**	−0.690***	−0.611
	(0.061)	(0.245)	(0.046)	(0.255)	(0.706)
Oil production × log oil price	−0.323	−0.633	0.908***	−0.423	−0.089
	(0.647)	(2.116)	(0.134)	(1.147)	(4.116)
Observations	7,824	7,824	7,824	7,824	7,824
Panel B: Controlling for coca intensity interacted with year effects					
Coffee int. × log coffee price	–	−0.605**	−0.158***	−0.679***	−1.720*
	–	(0.249)	(0.060)	(0.236)	(0.931)
Oil production × log oil price	–	0.700	0.722***	0.247	1.781
	–	(1.361)	(0.153)	(0.671)	(2.053)
Observations		17,604	17,604	17,604	17,604
Panel C: Removing every coca municipality					
Coffee int. × log coffee price	–	−0.349**	−0.132**	−0.314***	−0.667**
	–	(0.139)	(0.052)	(0.100)	(0.324)
Oil production × log oil price	–	0.568	0.630***	0.100	1.258
	–	(1.444)	(0.053)	(0.728)	(1.932)
Observations		13,428	13,428	13,428	13,428

Fetzer (2020): Policy to Mitigate Conflict

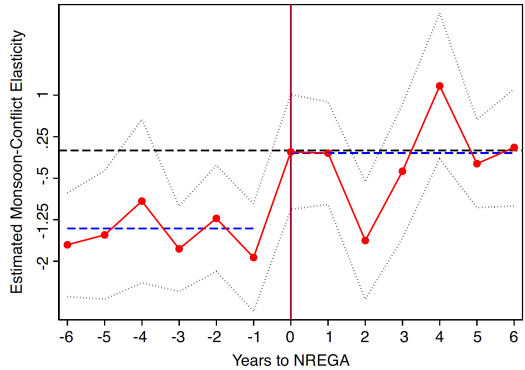
- India's NREGA, established in 2005, is a legal entitlement to 100 days of (minimum) wage paid public employment per household, per fiscal year, in rural areas.

- How does it affect the effect of monsoon rainfall on Maoist insurgencies?

(a) Total Number of Events



(b) Casualties



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Fetzer, Thiemo (2020). “Can workfare programs moderate conflict? Evidence from India”. *Journal of the European Economic Association* 18.6, pp. 3337–3375.