Combating Crime and Violent Extremism using Forensic Economics

Quy-Toan Do

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http://econ.worldbank.org/policyresearchtalks
What is forensic economics

- The application of economic tools to the study of crime
- Theory: criminals respond to incentives (Becker 1968)
  - “Supply” of crime/criminals
  - “Demand” for crime = supply of opportunities to commit crime
- Empirical investigations of market for crime (Ehrlich 1973)
  - Identification of supply versus demand
  - Policy: level of apprehension and punishment
The “crime market”

- S: Incentives to commit crime
- D: Opportunities to commit crime
Combating crime is a public economics problem

Supply-side intervention: increase [opportunity] cost for criminals

Demand-side intervention: decrease opportunities to commit crime
Measuring demand/supply price elasticity to guide policy

- Impact of supply-side policies depend on (i) size of the curve shift, and (ii) slope of the demand curve
Three case studies

1. The African elephant poaching crisis
2. Piracy off the coast of Somalia
3. Violent extremists of Daesh
The African elephant poaching crisis

The magnitude of the problem
The African elephant poaching crisis

with

- Julian Blanc (CITES)
- Andrei Levchenko (U Michigan)
- Lin Ma (National University Singapore)
- Tom Milliken (TRAFFIC)
Poaching

- 419-650,000 elephants in Africa (2013)
- 3-5 million in early 20th century
- 2011: estimated 7.4 percent of elephant population killed (monitored sites)
Quantity and prices

- Price and quantities are two sides of the same coin
- Price a necessary variable to estimate price elasticity of poaching
- Law enforcement affects poaching through prices
Real elephant ivory prices (1970-2015)

- CITES trade ban: 1989
- Post-ban price growth: 14% per annum
- Ivory behaves like a financial asset (store of value)
Supply elasticity: poaching vs. ivory prices

Supply price inelastic: Elasticity $\approx \, 0.4$
What did we learn?

- Low supply price elasticity
  - price needs to drop a lot to bring poaching to sustainable levels

- Decentralization of law enforcement and the role of communities
  - Ability and incentives to enforce law
  - Financial benefits *conditional* on conservation: negative prices
The pirates of Somalia
The Pirates of Somalia

with

- Jean-Baptiste Blanc (Shekere Ltd)
- Aurelien Kruse (World Bank)
- Trung Dang Le (Real Time Analytics)
- Andrei Levchenko (U Michigan)
- Lin Ma (National University Singapore)
- Farley Mesko (Sayari Analytics)
- Claudia Ruiz (World Bank)
- Anja Shortland (King’s College)
Somali piracy 2005 - ?

As of June 2015:
- 1,099 attacks
- 216 vessels hijacked
- US$338m in ransoms
- 4 years of captivity
Attacks and hijacks

- Pirates of Somalia
- Piracy in numbers

Number of Attacks

Year

Somalia Indonesia
West Africa Caribbean
Others

Number of Attacks Success Rate

Year

Number of Attacks Success Rate

Quy-Toan Do
Economics of Crime
PRT 2016
Hijacking and ransoms

![Graph showing average ransom and negotiation length over years](image)
Modelling crime and deterrence on the high seas

Data limitations does not allow earlier methodology:

Alternative: take a model literally and choose coefficients that best explain:
- pace of pirates improved ability
- suddenness of attacks/fall
- trends in ransom and lengths of captivity, etc.
Policy counterfactuals

- Crime elasticity w.r.t. police
- Optimal combination of navies/onboard security

**Counterfactual 1:**
no onboard security

**Counterfactual 2:**
no navies
Navies and onboard security guards

- Security guards critical to explain collapse of piracy in 2012
- 75% of large vessels to be equipped with armed guards is sufficient
- US$50,000 per trip = US$500m annually (or US$10+ bn in NPV)
  - Significant “pecuniary externality”
  - Ransom totals approx US$50m/year
Using AIS to locate hijacked vessels

Mooring locations

[Map of Somalia with mooring locations indicated]
Somali piracy to return if no solution on land: report

Navy patrols and armed guards on ships have helped quash once rampant Somali piracy, but without political solutions onshore attacks will likely return, the World Bank warned.

Posted 11 Apr 2013 17:37

MOGADISHU. Navy patrols and armed guards on ships have helped quash once rampant Somali piracy, but without political solutions onshore attacks will likely return, the World Bank warned on Thursday.

While the number of pirate attacks from Somalia are at a three-year low, costly measures including patrols by international warships in the Gulf of Aden and Indian Ocean are not a long-term solution to the problem, the bank said in a report.

“These are only effective as long as they remain in place: they would have to be permanent to prevent any resurgence of piracy,” said report co-author Quy-Toan Do. “Because of the high cost of these counter-measures, in the long run they may simply be unsustainable.”

Naval patrols include both US and European Union operations.

Instead, more efforts should be made to tackle the problem on land with a shift of attention...
And alas...

Somali pirates seize Iranian, Thai ships

By Robyn Kriel and Briana Duggan, CNN
Updated 2:16 AM ET, Tue November 24, 2015

One expert says the potential for Somali piracy to rebound is high.

**Story highlights**

- Iranian and Thai fishing vessels were among the targets of four attacks this month.
- Higher security had cut the number of attacks, but they could increase, expert says.
- (CNN) — Somali pirates successfully attacked an Iranian and a Thai fishing vessel over the past 24 hours, although one crew escaped, an anti-piracy expert said.
- There were another two unsuccessful attempts this month.
  - In March, another two vessels, both Iranian, called the Jaber and the Siraj, were captured just off the Somali coast. The crew of the Jaba escaped by overpowering their captors, but the Siraj crew was taken ashore in September. It was the first successful attack in the Gulf of Aden in two years, Steed said.

According to anti-piracy expert John Steed of Oceans Beyond Piracy, which runs a support program to help hostages, the attacks occurred more than 200 nautical miles off Somalia’s coastline. The pirates were using small skiffs, a clear indicator of range.

*The attacks are on fishing vessels, which shows because of the high levels of illegal fishing off...
The violent extremists of Daesh

Daesh – ISIL/ISIS

with

- Mohamed Abdel-Jelil (World Bank)
- Kimberly Baugh (U of Colorado)
- Shanta Devarajan (World Bank)
- Chris Elvidge (National Oceanographic and Atmospheric Admin.)
- Jamie Hansen Lewis (Brown U)
- Jake Shapiro (Princeton U)
- Mikhail Zhizhin (NOAA & Russian Space Research Institute)
Islamic State in Iraq and the Levant

- Origin in 1999 with Islamic State in Iraq (ISI): part of the Iraqi insurgency against Western forces
- Al-Nusra front in Syria following outbreak of civil war (2011)
- Self-proclaimed ISIL/ISIS in April 2013
The violent extremists of Daesh

A short history
Its financial sustainability

- Oil
- Smuggling and taxes
- Looting and confiscation
- Foreign donors
- Kidnapping
- Leakage of Iraq’s Central Bank foreign reserves
Oil revenues: what has been said?

How Iraq's black market in oil funds ISIS

Inside Islamic State’s oil empire: how captured oilfields fuel Isis insurgency

Isis Inc: how oil fuels the jihadi terrorists
Estimating oil production
The case of Ajil
Pre-war oil production

Beta=0.7999  Linearity test (p-value) = 0.1749  R-squared=0.4809
Daesh oil production

Production and Revenue With Venting

- $25 fixed
- Half Daily Brent Price
- Daily Brent Price
Revenues and production

- We estimate an upper-bound of oil production that peaked at 31,000 barrels per day in August 2014.

- Production then fell to a 2015 average of 18,000 barrels per day, yielding an approximate daily revenue of US$454,000.
A similar supply/demand dichotomy

Dealing with the jihadist group’s finances

- Oil is not (has never been) a significant source of revenues
- Extortion and taxes
- External support

Fight radicalization in MENA countries and beyond

- Inclusive institutions and policies
- Youth employment
- Rebuilding the social contract
Conclusion

What did we learn?
International crime and violent extremism: the commonalities

- Crime and violent extremism: a labor intensive “sector”
- Decentralization of law enforcement: capital/labor substitution and community-driven enforcement
  - Ability of communities to enforce the law
  - Incentives for communities to enforce the law
- Global spillovers
  - Mechanisms to solve collective action problem
  - Role of multilateral institutions
Forensic economics and policy

- Unconventional data collection for policy analyses of an unconventional economic activity
- 3 cases where evidence brings new perspective to policy consensus