A TALE OF GOLD AND BLOOD: THE UNINTENDED CONSEQUENCES OF MARKET REGULATION ON LOCAL VIOLENCE

INTRODUCTION

This paper shows how market agents themselves can help monitor illegal activities – and how this can be relevant to deter violence associated with illegality.

• Governments in developing countries often struggle with the pervasiveness of illegal activities in the production of valuable natural resources.

• When direct government monitoring is low/hard, market incentives might help regulate illegal activities.

• We show that relatively small changes to these incentives can have large effects.

RESEARCH QUESTION AND HYPOTHESIS

We inquire how market de-regulation, by changing the incentives to private monitoring for some players, can affect the equilibrium level of illegal activities and violence.

• Context: 2013 Brazilian gold market de-regulation that facilitated the process of laundering illegally mined gold – that is, the conversion of illicit gold into licit gold.

• Setting: Brazilian Amazon, where gold-mining is an important activity, but also notoriously hard-to-monitor because of the forest.

• Hypothesis: The policy should lead to ...

1. a decrease in the incentives for local gold stores to verify whether the product has legal origins or not.
2. an increase in demand for illegal gold, and consequently a stimulus to illegal exploitation.
3. an increase in disputes for illegal gold deposits among miners.
4. an increase in violence associated to these disputes.

• Empirical Strategy: Difference-in-Differences comparing municipalities with legal and illegal gold deposits, before and after the regulatory change in 2013.

2013 REGULATORY CHANGE

Before 2013: both gold buyers and gold sellers had to report potentially illicit operations from their counterparts.

After 2013: buyers were exempted of the liability for buying illegal gold

• Buyers were allowed to acquire raw gold under the Principle of Good Faith, assuming that all documents provided by miners were legitimate → now only miners are liable.

• This allowed for gold and money laundering using existing mining permits.

• For example, multiple sellers declare their (illegal) gold originates from one single permit area, regardless of their true origin.

DATA

Main challenge: identifying illegal mining activity.

• We overcome that by focusing on the location of gold deposits and whether they are inside Conservation Areas and Indigenous Territories, where mining is strictly forbidden.

• The municipalities with deposits in these protected areas are considered more exposed to illegal mining.

Figure 1 shows that gold deposits are widely distributed across the Amazon and also that there is a lot of intersection with protected areas.

PREVIEW OF RESULTS: Figure 2 suggests that after 2013 the homicide rate increased disproportionately in municipalities more exposed to illegal gold.

• Violence: homicides per 100,000 inhabitants

EMPIRICAL MODEL

Our difference-in-differences model has three groups: (i) municipalities exposed to illegal gold mining, “IGD”; (ii) municipalities exposed to any gold mining, “GD”; (iii) and municipalities not exposed to gold mining, which are omitted.

\[
\text{Homicides}_{it} = \delta_0 + \delta_1 \text{IGD}_{it} + \delta_2 \text{GD}_{it} + \delta_3 \text{D}_{2013it} + \delta_4 \text{IGD}_{it} \times \text{D}_{2013it} + \beta X_{it} + \mu_i
\]

We are interested in \(\delta_4\), which provides the impact of reducing private monitoring on violence in places more exposed to illegal gold mining. This effect is conditional on being exposed to any gold mining.

RESULTS

Places more exposed to illegal gold-mining experience an increase of more than 8 extra homicides per 100,000 (95% c.i.) after the regulatory change.

MECHANISMS AND ROBUSTNESS

Violence is coming from increasing illegal activity in places where mining is strictly forbidden. In this case, we measure illegal activity using the incidence of mining-related environmental crimes and deforestation.

Effect on violence is exclusive to areas exposed to illegal gold mining; we do not see the same pattern when studying other valuable minerals.

RELATED LITERATURE


10.1257/app.20160055

ISSN: 19457792

10.1111/ecoj.12487

ISSN: 19457792

Fig. 1: Gold deposits, Indigenous Territories, and Conservation Areas in the Brazilian Amazon as of 2020

(Source: Ministry of Environment, FUNAI, and Brazilian Geological Service)

Fig. 2: Violence in municipalities with less than 100,000 people and presence of gold deposits

(Source: DATASUS, Ministry of Environment, FUNAI, and Brazilian Geological Service)

Fig. 3: Effect of reducing private monitoring on homicides in places more exposed to illegal gold mining (95% c.i.)

Our difference-in-differences model has three groups: (i) municipalities exposed to illegal gold mining, “IGD”; (ii) municipalities exposed to any gold mining, “GD”; (iii) municipalities not exposed to gold mining, which are omitted.

\[
\text{Homicides}_{it} = \delta_0 + \delta_1 \text{IGD}_{it} + \delta_2 \text{GD}_{it} + \delta_3 \text{D}_{2013it} + \delta_4 \text{IGD}_{it} \times \text{D}_{2013it} + \beta X_{it} + \mu_i
\]

We are interested in \(\delta_4\), which provides the impact of reducing private monitoring on violence in places more exposed to illegal gold mining. This effect is conditional on being exposed to any gold mining.

Places more exposed to illegal gold-mining experience an increase of more than 8 extra homicides per 100,000 (95% c.i.) after the regulatory change.

MECHANISMS AND ROBUSTNESS

Violence is coming from increasing illegal activity in places where mining is strictly forbidden. In this case, we measure illegal activity using the incidence of mining-related environmental crimes and deforestation.

Effect on violence is exclusive to areas exposed to illegal gold mining; we do not see the same pattern when studying other valuable minerals.

RELATED LITERATURE


10.1257/app.20160055

ISSN: 19457792

10.1111/ecoj.12487

ISSN: 19457792

Fig. 1: Gold deposits, Indigenous Territories, and Conservation Areas in the Brazilian Amazon as of 2020

(Source: Ministry of Environment, FUNAI, and Brazilian Geological Service)

Fig. 2: Violence in municipalities with less than 100,000 people and presence of gold deposits

(Source: DATASUS, Ministry of Environment, FUNAI, and Brazilian Geological Service)

Fig. 3: Effect of reducing private monitoring on homicides in places more exposed to illegal gold mining (95% c.i.)