Does crime affect economic growth?
A case study of the city of Manaus

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Motivation to study violence/crime in Brazil
Statistics

✓ **12 million** – Number of people that were victims of robbery or theft in 2010¹;

✓ **17.500** - Number of cargo theft incidents in 2014²;

✓ **622.205** – People arrested in Brazil in 2016³;

✓ **75%** – Percentage of brazilian population with fear of being murdered⁴;

✓ **61.619** – Number of murder in Brazil in 2016⁵.

Source: 1- IBGE; 2- NTC&Logística; 3 – Ministério da Justiça; 4- Datafolha; 5 - IPEA
Since the beginning of the Syrian civil war...

... Brazil had recorded more murders than the muslim country (280k vs. 256k)

Source: Anuário Brasileiro de segurança pública
Why Manaus?

- Because in 2007, due to an exogenous shock, a criminal organization called Família do Norte was created.
How this criminal organization was created

• Manaus had some drug dealers, but until 2007 they were isolated;
• The tipping point was some year late, the main drug dealers were arrested and went to federal prison;
• While they were arrested, they were convinced by some members of PCC and CV to create a criminal organization in Manus;
• When these drug dealer returned to Manaus they created “Família do Norte”.

Source: Operação La Muralla
Família do norte

• Become the 3rd biggest organized crime in Brazil;
• Control the “Solimões route”;
• According to the leader, they had 200k members registered in 2015;
• Owned a soccer team;
• Negotiated votes for the governor of Amazonas;

Source: Operação La Muralla
Homicides had surge in Manus after 2007
Empirical Strategy
Empirical Strategy

• Synthetic Control method
  • Weighted average of other regions unaffected by criminal organization activity that mimics the economic structure of Manaus few years before treatment.
    • Exogenous shock ✓
    • The shock (FDN) need to be sufficient large ✓
    • Good control group (donor pool)
Donor pool

- 100 major cities from Mato Grosso, Tocantins and Goias
  - Unaffected by criminal organization
  - Geographically close to Manaus
- Problem?
  - The most important sector from Manaus (Industry) is different from donor pool (agriculture)

Main characteristics of Manaus before 2007

<table>
<thead>
<tr>
<th></th>
<th>Manaus</th>
<th>Donor pool average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income per capita</td>
<td>0.20</td>
<td>0.22</td>
</tr>
<tr>
<td>Manufacturing share</td>
<td>38%</td>
<td>21%</td>
</tr>
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<td>Capital per capita</td>
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<td>3.6</td>
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<tr>
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<td>GDP per capita (1999)</td>
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• Stata code
  • ssc install synth, replace all (to install synth method in stata)
  • Help synth
Results
Results

Weight of each city in the synthetic control

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<tr>
<th>State</th>
<th>City</th>
<th>Weight</th>
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<tbody>
<tr>
<td>GO</td>
<td>Corumbaiba</td>
<td>56%</td>
</tr>
<tr>
<td>GO</td>
<td>Minaçu</td>
<td>15%</td>
</tr>
<tr>
<td>MT</td>
<td>Cuiabá</td>
<td>12%</td>
</tr>
<tr>
<td>MT</td>
<td>Alto Araguai</td>
<td>8%</td>
</tr>
<tr>
<td>GO</td>
<td>Cavalcante</td>
<td>4%</td>
</tr>
<tr>
<td>GO</td>
<td>Catalão</td>
<td>4%</td>
</tr>
<tr>
<td>GO</td>
<td>Mozarlândia</td>
<td>2%</td>
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Nominal GDP per capita (R$ Thousand) – Manaus and synthetic control

Gap between Manaus and synthetic control GDP (R$ Thousand)
Results

Gap between number of murder and GDP per capita
Placebo test

Placebo test

p-value: 5%

Placebo test – removing outliers

p-value: 2.3%
Robustness test

**Synthetic control removing Catalão**

![Graph of PIB Per Capita](image1)

**Synthetic control removing Catalão and Alto Araguaia**

![Graph of PIB Per Capita](image2)

**Synthetic control removing Catalão, Alto Araguaia and Mozarlândia**

![Graph of PIB Per Capita](image3)

Fonte: O autor
Robustness test
Final remarks
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• The presence of Família do Norte lowers GDP per capita by 20% during the analyzed period; or 3% per year.
  • Other paper find similar results ~10/15%);

• At the same time, the homicide rate rose 75% while in the other cities we found a stability.

• If we invest in public security we could find a solution, however if we dont do anything, this problem could get worse as new criminal organization are been created, specially on the Northeast.
Thank you!

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