Organized crime and transit accessibility

Research project - Economic Geography 2025

Renan Andrade

MSc Economics EPGE/FGV

Main question

Do factions form preferences over transit accessibility?

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Introduction

The faction's spatial problem

Literature motivation: *Cities in Bad Shape* (Harari, 2020).

- Households (workers, consumers) value compact layouts
- Firms: not so much?
- Transit accessibility is an important channel

$\rightsquigarrow$ What about **factions**?

The faction's spatial problem

Like firms, costs in locating itself in poorly connected locations:

- Within-faction aggregation economies
- Domain size
- Further expansions

However, iron ties to consumers:

- Major costs of entry and exit
- Major premia to monopolizing violence
- Natural technologies of enemy deterrence

Objective and literature

Specialize Harari's (2020)

- Main channel to road accessibility; and
- Agents to factions
- ⏩ On-hold compactness script

In this environment,

- Factions arguably indifferent to public transportation (directly)
- But not as mobile as firms

Wider literature insertion

- Urban transport and crime spillovers
  - Phillips, David C.; Sandler, D. (2015). Does public transit spread crime? Evidence from temporary rail station closures. *Regional Science and Urban Economics*, 52, 13-26.
- Spatial wealth inequality (and crime incentives)
  - Demombynes, G., & Özler, B. (2005). Crime and local inequality in South Africa. *Journal of Development Economics*, 76(2), 265-292.
  - Harari, M. (2024). *Residential Patterns and Local Public Goods in Urban Brazil*. WP.
- State formation and stationary bandits
  - Sánchez De La Sierra, R. (2020). On the origins of the state: Stationary bandits and taxation in eastern Congo. *Journal of Political Economy*, 128(1).

Data

Data sources

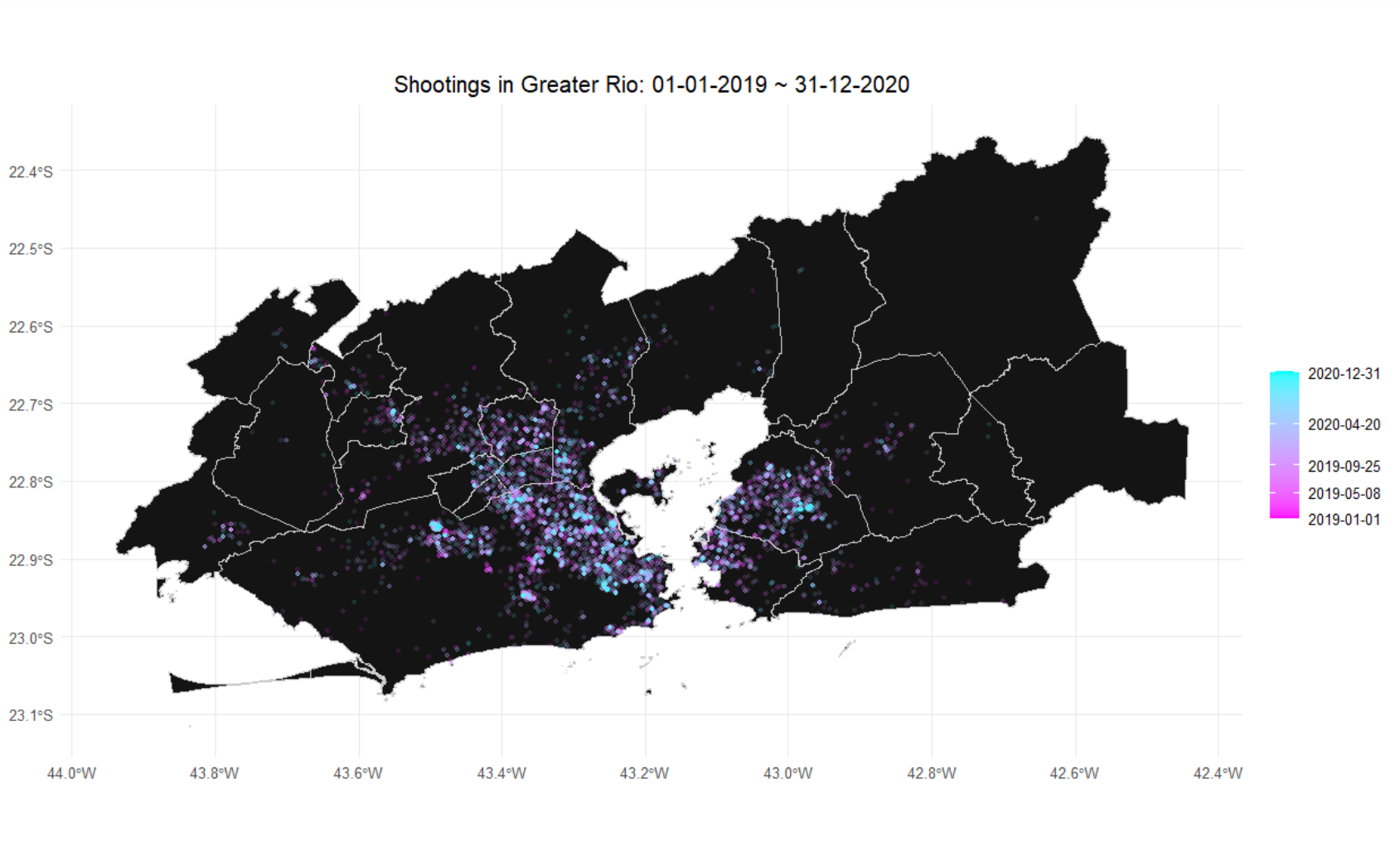
Shootings

- Instituto Fogo Cruzado (IFG)
- Metropolitan areas of Rio, Salvador, Recife and Belém
- 04/07/2016 $\sim$

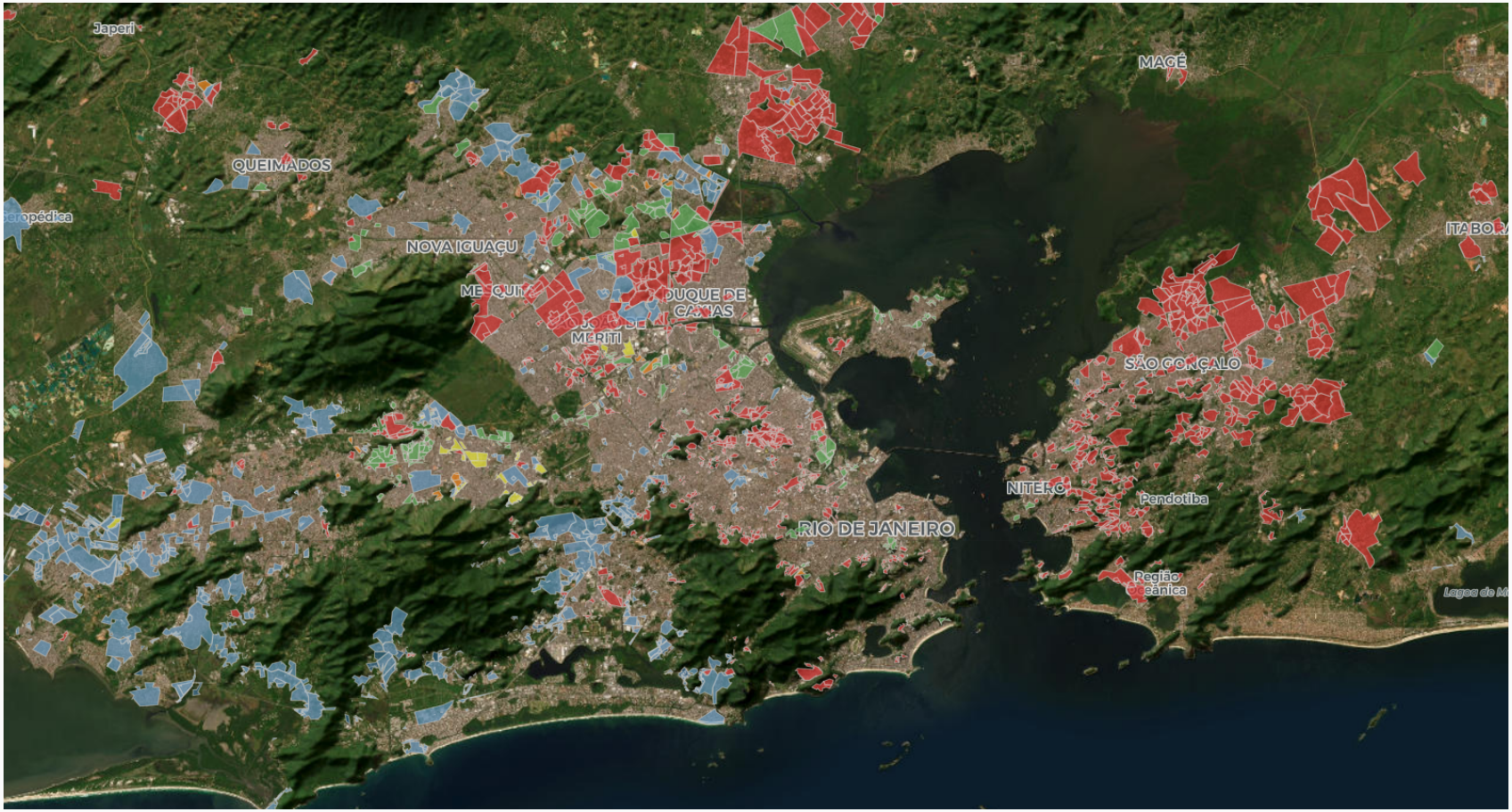
Faction domains (Pr. Marcos Salgado - EPGE/FGV)

- Instituto Fogo Cruzado (IFG) + GENI/UFF
- Metropolitan area of Rio de Janeiro
- 2008 $\sim$
- Supplementary 1: CrimeNewsBR, Uber drivers
- Supplementary 2: Historical literature, newspapers

Shootings data



Mapa Histórico dos Grupos Armados do Rio de Janeiro



More data sources

The `osmdata` library

- Roads, streets, highways etc. (historical?)
- Terrain incline

The `geobr` library

- Historical and current maps for Brazil
- Neighborhoods, municipalities, biomes etc.

Demographic data

- National census (2000 and 2010 microdata available)
- PNADc

Estimation strategy

DID route

Example specification 1: purely reduced-form

$$\bigoplus_{lt} \sim \mathbb{1}\{\text{new road}\}_{lt} + \cdots$$

Example specification 2: IO

$$\Pr[\text{incumbent change}]_{lt} \sim \bigoplus_{lt} \mathbb{1}\{\text{near new road}\}_{lt} + \cdots$$

Example specification 3: Networks

$$\Pr[\text{incumbent change}]_{lt} \sim \Delta f(\text{road connectivity})_{lt} + \cdots$$

Considerations

- Shock sources
  - Av. Brasil $\prec$ Linha Amarela $\precsim$ Linha Vermelha $\precsim$ Arco Metropolitano
  - Motivates event studies
  - Fixed effects?

- Unit of observation: grid vs data-driven

- Endogeneity and omitted variables. Given a new road,
  - Factions incur in wealth and substitution effects
  - Need to account for beliefs in the game equilibrium

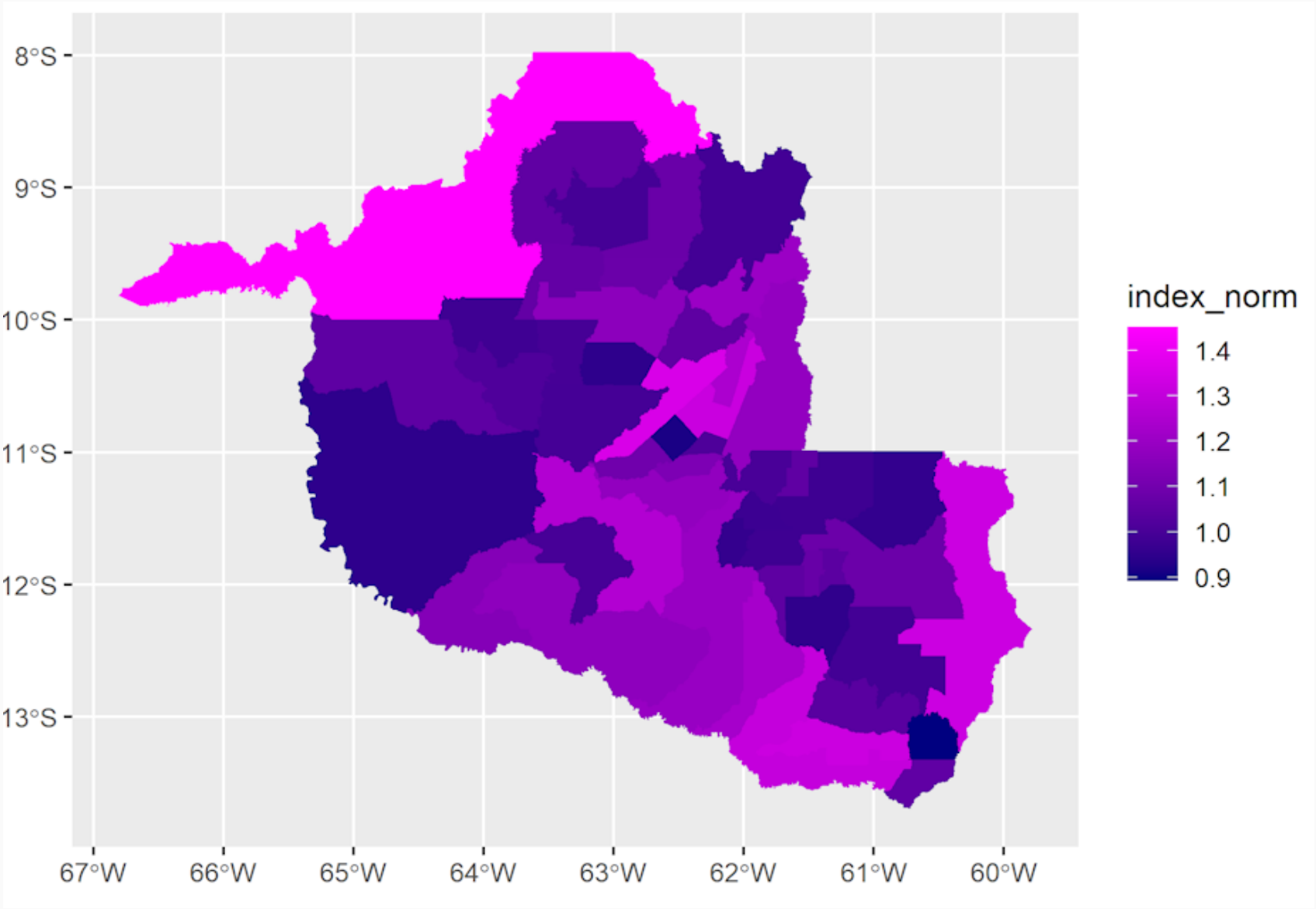
Conclusion

Final remarks

- Road infrastructure and faction decision-making
- Granular shootings, demographic and factions domains data
- Tentative specifications

Appendix

RO disconnection indices



PA disconnection indices

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