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Estimating an Interregional Input-Output Table for Brazil Using NF-e Data

João Maria de Oliveira (Brazilian Institute of Research in Applied Economics - IPEA)

Patieene Alves Passoni (Federal University of Alagoas (UFAL) and /IPEA

Motivation

- National IO tables treat countries as homogeneous regions
- Brazil has deep regional inequalities
- Interregional IO analysis reveals regional complementarities and bottlenecks
- Traditional data lacks granularity or is outdated
- This study uses microdata to overcome these limits

Objective of the Study

- Estimate a full IIOT for Brazil (2018)
- Cover 27 states and 68 sectors
  - Related to Brazilian Supply and Use Table (SUT)
- Use administrative microdata from NF-e (invoices)
- Provide tools for regional policy

Background: Interregional IO Models

- Builds on Isard (1951) and Leontief's (1956) work
- Captures cross-region linkages and feedbacks
- Supports spatial simulations and development policy
- According to Isard et al. (1998), the main advantage of interregional input-output (IRIO)models is their ability to capture **spillover effects**, whereby a demand shock in one region influences other regions and feeds back into the original region through interregional economic linkages.

Challenges in IIOT Estimation

- Traditional surveys are costly and incomplete
- 702 trade flows to estimate (27x27)
- Non-census methods dominate: LQ, RAS, gravity models

Data Innovation: NF-e Microdata

- Mandatory system since 2006
- Federal revenue (Receita Federal)
- Detailed info on buyer/seller, product, tax, freight
- Harmonized with national accounts
- Enables granular inter-state trade tracking

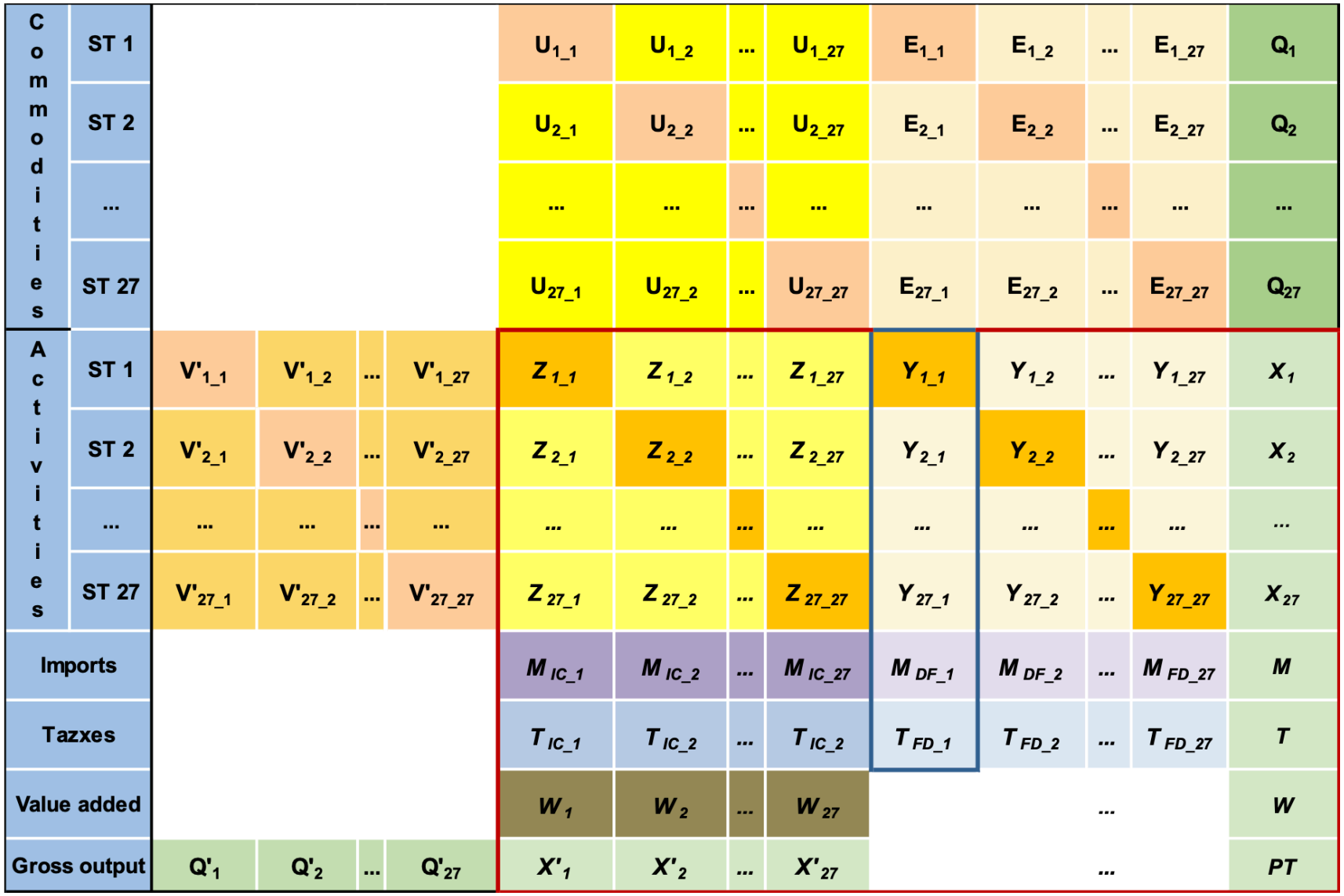
Methodology Overview

- Based on SUIT (Guilhoto et al.)
- Top-down (SNA) + Bottom-up (NF-e)
  - Values from SNA and shares from NF-e
- Ensures consistency with IBGE and RAS
- Named SUITnf

Steps in Estimating the IIOT

- 1. Clean and harmonize NF-e data
- 2. Build national SUT
- 3. Disaggregate to interregional SUT
- 4. Assign product use categories
- 5. Build Make/Use tables
- 6. Estimate taxes, margins, imports
- 7. Reconcile with RAS

Figure 1 – General schematic of the interregional input-output model.



Source: Authors' elaboration.

Final Demand Estimation

- Household: POF shares
- Government: NF-e
- Investment: NF-e + GFCF matrix
- Exports: NF-e
- Inventories: residuals
- Allocation by regional shares

Reconciliation and Balancing

- Match macroaggregates: gross output, value-added and intermediate consumption
  - There are available information for 12 sectors and all the 27 states
- Adjust via RAS values
- Manual fixes for public services
- Cross-checks with PAS, PIA, PAC

Preliminary Results

- High granularity and accuracy
- Reveals diverse regional structures
- Captures actual trade and spillovers

Contributions

- First complete IIOT from NF-e
- New empirical base for spatial modeling
- Supports policy simulations and planning

Next Steps

- Finalize and validate matrix
- Expand to time series - 2021
- Include labor and household modules
  - Make a social account matrix
- Macroregional aggregation - five big regions
- Disseminate for policy use

Thank You / Q&A

- Contact: patieene.passoni@feac.ufal.br
- Questions and comments welcome