Microsimulation Models in Australia

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Content

- Context and Uses
- Methodological Choices
- Challenges and Trends

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Context and Uses

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Context and Uses

- Taxation
- Health
- Demographic
- Education
- Spatial (AURIN) Traffic/Transportation

Taxation

- STINMOD
- EUROMOD (Australia)

Health

- APPSIM
- Pharmaceutical Benefit Scheme (PBS) model
- Type 2 Diabetes
- LifelossMod (University of Sydney)
- HealthAgeingMOD (Australia, 2007)
- Health&WealthMOD / HealthMOD (Fukawa, 2012)
- CareMod (Chin & Harding, 2006,2007; Lymer et al., 2009, 2008)
- DYNOPTASIM (Australia, 2011)

Demographic

- APPSIM
- CAMSIM
- Others

Education

- Department of Education
- Distribution of Student Enrollment Profile
- Vocational Education Financing Model

Planning / Region Visualisatoin

- Mix Spatial Information with STINMOD
- AURIN
- Spatial model on housing stress

Others

- Farm production

Analytical Scope

- Distributional Analyses
  - STINMOD/MITTS
- Longitudinal Analyses
  - APPSIM
- Spatial Analyses
- Ex ante Policy Evaluation
  - Basic and Advanced

Methodological Choices

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Methodological Choices

- Data
- Parameterisation
- Microsimulation methods
- Development environment

Data

- STINMOD and MITTS use Survey of Income and Housing (SIH)
- APPSIM uses Census / Household Income and Labour Dynamics (HILDA)
- CAMSIM, synthetic data
- SASSI, administrative record

Parameterisation

- Not many structural behaivoural models in Australia
  - MITTS
  - STINMOD-B
  - A number of academic papers
- Typical focusing on labour market behaviours only
- Majority of the existing microsimulation models use reduced form estimations

Microsimulation Methods

- Too many, , see Li and O'Donoghue (2013) for Dynamic models, Tanton (2014) and O'Donoghue, Morrissey, and Lennon (2014) for Spatial Models and Ahmed and O'Donoghue (2007), Bourguignon, Bussolo, and Cockburn (2010) for Macro-Micro models
- Mostly static
- Dynamic models in
  - Health
  - APPSIM
  - Hypothetical demographic research
- Reweighting

Development Environment

- Standard statistical tools
  - STINMOD
- Generic Programming language
  - APPSIM, SASSI
- Microsimulation framework
  - ATM
- Newer models are different
  - R/Python/Cython

Challenges and Trends

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Challenges

- Administrative Barrier:
  - Dataset (Census problem)
  - Health / Medicare linkage
- Data Quality Barrier:
  - Area definition / postcode issue
- Maintenance
  - Universities cannot afford model maintenance anymore
- Cross-country comparison

Trend

- Visualization
  - Mapping is gaining popularity
- “Big” data
  - Spatial Data
  - Incorporate non-traditional data (e.g. Twitter, OpenStreetMap)
  - Media /Social Media Data
- Usability / Public exposure

Remarks

- Australia has a suite of microsimulation models that were/are actively used
- Collaborations
  - Hardly any model is created by one-person
  - Lacks International comparison
  - Large multi-purpose models become possible