MicroWELT: Distributional effects along the lifecycle

Outline

1. The microWELT dynamic micro simulation model and main results
2. A relevant input: NTAs by family type and education level
3. Next Steps
1. MicroWELT.... Context Weltransim Project

• Weltransim project – Joint Programming Initiative “More Years, Better Lives” – Horizon 2020
  • Who pays for longer lives?
  • Comparative analysis of welfare transfers in 4 welfare state regimes (ES, AT, FI, UK) in the context of
    • - Population ageing
    • - Longer lives and life expectancy differentials by education

• Project duration: 2017-2020

• University Barcelona (UB) – Coordinator
  Austrian Institute of Economic Research (WIFO)
  Finish Institute for Economic Research (VATT)
  Finnish Centre for Pensions (FCP) - NTA Finland
microWELT – Design & Development Steps

• Design:
  • Highly modular and refineable modeling platform
  • Fully (self-) documented step-wise implementation
  • Builds on existing tools in EU:
    • Starts from EUROMOD (SILC data) static tax-benefit model
    • Applies dynamic microsimulation too to make EUROMOD dynamic in a styled way

• MicroWELT-POP: Detailed socio-demographic projections including:
  • Family histories
    • Fertility by education, focus on concentration of reproduction: 1\textsuperscript{st} child (or childless), 2\textsuperscript{nd}...
    • Partnerships: realistic careers reproducing observed patterns by education, age of youngest child, and education. Matching
  • School enrolment + intergenerational transmission of education.
  • Mortality by education: life expectancy differences

• MicroWELT-NTA:
  • Input parameter: Disaggregated longitudinal NTA accounts by education and family type
  • Macro module: Reproduces available macro projections with NTA accounts and indicators (Lee and Mason, 2017 Agenta Keynote WP and Lee et al. 2017 PDR on Full Generational Accounts)
microWELT - Architecture

• MicroWELT is a MICA model
  • Modgen / openM++
  • Interacting Population
  • Continuous Time
  • Alignable

• Cross-fertilization & synergies within MICA family
  • Common core
  • Shared modules

• Intended to become a multi-purpose modeling platform
microWELT – some more details

MicroWELT-POP:
• **Education**: primary, secondary, post-secondary
• **Family/education groups**
  • Children 0-16 by parents education
  • Students 17-25 by parents education
  • Non-Students 17-25 by sex, education, partner, presence/age children
  • Adults 26-59 by sex, education, partnership, presence/age children
  • Adults 60+ by sex, education, childlessness

MicroWELT-NTA: Lee & Mason 2017
• Simple Cobb Douglas economy without innovation
• Fixed capital stock and saving rates by age as today
• Two versions: open economy, closed economy
• Adjusting/not taxes and/or benefits to balance budget
• Support Ratio and Impact Index
microWELT-NTA – Outcomes (Spain)

• Base Scenario (aggregated NTA)
  • Support Ratio (Labor input / Effective Consumers) drops by 1/3
  • Impact Index (Consumption / Effective Consumers) drops by ¼
  • Difference due to changing wages

• Disaggregated NTA Scenario: Support ratio drops less and Impact index drops more
Full Generational Accounts (Lee et al. 2017) – assuming g=1.5, r=3%

- Unadjusted: NPV of public transfers 15% of NPV of labor income
- Disaggregation of NTAs only a small effect? NPV by education group very different.
- Adjust all taxes & transfers to balance the budget each year. NPV turns negative: 2011 birth cohort still close to 0 but quite negative for 2040 birth cohort.
- Using dis-aggregated NTA data, the effect is more dramatic
Figure 4: The effect of mortality differences by education on the NPV of public transfers
2. Building NTA both by education and family type

- Problems: Outliers, representativeness => 5 year age group
  - Smooth or not to smooth
  - Supsmoother not working for 17 (instead of 90) age groups
  - Smooth only types, no the average

- Parents no cohabiting, cohabiting no parents? We consider cohabiting

- 60+ parents? Impute it using SHARE (done in AT results)

- “Dependent” children: For the moment survey definition (change it)

- Extended households: Ignored in the model
Parents
- less income (AT)
- More steep (ES)
Private asset income (YAF)

Highest couple child-less
Importance household head assumption
Public Consumption Education (CGE)
Private Consumption Education (CGE)
Private Consumption Health (CFH)

- Family type: Student
  - Sex: Both
- Family type: Single childless
  - Sex: Female
  - Sex: Male
- Family type: Single parent
  - Sex: Female
  - Sex: Male
- Family type: Couple childless
  - Sex: Female
  - Sex: Male
  - Sex: Both
- Family type: Couple parent
  - Sex: Female
  - Sex: Male
  - Sex: Both
- Family type: Single over 60
  - Sex: Male
  - Sex: Female
  - Sex: Male

Education:
- Low
- Med
- High
- Independent

Average:
- Agents

Age

0 20 40 60 80
CFX: Private Consumption other than Education and Health
Public Transfers Pensions, Inflows (TGSOAI)

Educational levels:
- Low
- Med
- High
- Independent

Average:
- Agent

Graphs show the distribution of family type and sex by age and educational level.
Net Intrahousehold Transfers (TFW)
Next steps

• Built NTA both by education and family type

• Immediate future:
  • Adapt the household head assumption: Combine share in earnings + being adult  --- comments welcome

• Future
  • Aiming to micro model main variables (Yl, C, Taxes, Transfers ) it to project it to the future
  • Add NTTA into the model
Thank you