Pensim2

Analysing the Effect of Government Policy in the Long-term

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Outline of presentation

- What is Pensim2?
- Why do we need it?
- How does it work?
- How have we used it?
- Other uses?
- Questions

What is Pensim2?

- Pensim2 is a dynamic micro simulation model for predicting future pensioner incomes between now and 2050
  - Dynamic as it models events over time
  - *Micro*-simulation because it models events at the individual level.

Why dynamic microsimulation?

- Long-term nature of pensions policy
- Residual benefits (MIG, Pension Credit) are used to prevent poverty in old age. These are calculated on the basis of other income brought to account
- So we need to know the *shape* of the pensioners' income distribution
- Key debates are about who gains and who loses as a result of policy reform.

Advantages of dynamic microsimulation

- Difficulty of capturing cohort effects in a static snapshot of the future
- Scenarios of interest need to examine how entitlements are built up over time e.g. analysing the impact of personal accounts on private pension incomes and their distribution
- Static models say nothing about the life-course e.g. how might 80 per cent employment affect pension incomes and their distribution

How does Pensim2 work?

- ‘Age’ a population sample through time, simulating the occurrence of various life events
  - Use econometric analysis to estimate the probabilities of events taking place (e.g. Losing a job, contributing to a pension)
  - Apply these probabilities and draw random numbers to see what happens to each member of the sample
- For each member of the sample:
  - Build up a work and pension contribution history to 2050
  - Calculate pension income in retirement

How does Pensim2 work? - Base Data

- No single data source contains all information required from base data:
  - *Lifetime Labour Market Database (LLMDB)*
    1% sample of records from National Insurance administrative system. It contains 20-year long contribution history plus some historical employment information., but only limited contextual information.
  - *Family Resources Survey (FRS)*
    Main source for most of the cross-sectional data but contains very little/no historical information
- Data fusion by statistical matching, using the BHPS as a bridge

List of life processes

- Mortality
- Institutional Care
- Education
- Partnership
- Fertility
- Labour market status
- Occupation
- Earnings
- Pensions
- Savings
- Disability
- Tax/Benefits

External Alignment

- Constraining the simulation
  - External control totals (GAD Mortality Forecast)
  - Scenario control total (What would happen if male and female mortality rates equalised?)
- Method: Rank individuals according to their probabilities and select the *x* most likely to make a transition.

How is Pensim2 used? - Assumptions and Scenarios

- Make assumptions that determine the outcomes
  - The Policy Framework, Pensions Parameters, the Macroeconomy and Structural Trends
- Vary these assumptions and then compare the alternative scenarios
- See the difference in income for each member of the sample
  - See which groups gain or lose out in each case
- See the difference in govt expenditure or average pensioner income in each scenario

Limitations of the model

- Behavioural effects
  - Will the model ‘predict’ increases/reductions in savings as a result of changes to residual benefits?
- Estimates are only as good as the assumptions
  - This is primarily a tool for comparing alternative scenarios
- Long-range estimates have a wide funnel of doubt
- The UK has quite poor longitudinal data - but the model can be improved as this changes

Structure of the model

- Flexible model ‘architecture’
- Current life processes can be easily updated
- Other modules can be ‘bolted on’ - not just things needed for modelling pensioner incomes
- More user friendly than similar models

Other possible uses

- Student loans:
  - Repayment profiles depend on the earnings trajectories of students when they leave education
- Impact of different life-events:
  - What is the impact of being a teenage mother?
- Generational fairness

Conclusion

- Pensions policy has a very long time horizon and distributional issues are central
- This requires a long-term model that works at the micro-unit (individual) level
- The model will ‘age’ a sample, simulating a range of key life events, including the build-up of pension rights
- This will enable the comparison of alternative scenarios - including proposed changes to pension policies
- In the future, possibly other uses beyond pensions