Incorporating behavioural change & dynamic considerations in tax policy modelling

Jonathan Athow

Director Knowledge, Analysis and Intelligence and Chief Economist,
HM Revenue and Customs

Models, models, models

- Speaking from the perspective of HMRC (and Treasury)
- But Department of Work and Pensions also have models – with distinct benefits and pensions focus – and issues are similar
- My focus today is on ‘policy models’
  - Testing the effects of tax and benefit policy scenarios
  - Estimating distributional and microeconomic effects of those scenarios
- Greater focus on distributional/behavioural modelling in last 20 years or so
  - Increasing use of these tools in IFS and wider academia
  - Ministers expect to know the effects of policy (IFS/academia raised expectations)
  - Technology and improved applied techniques
  - Greater transparency in Government

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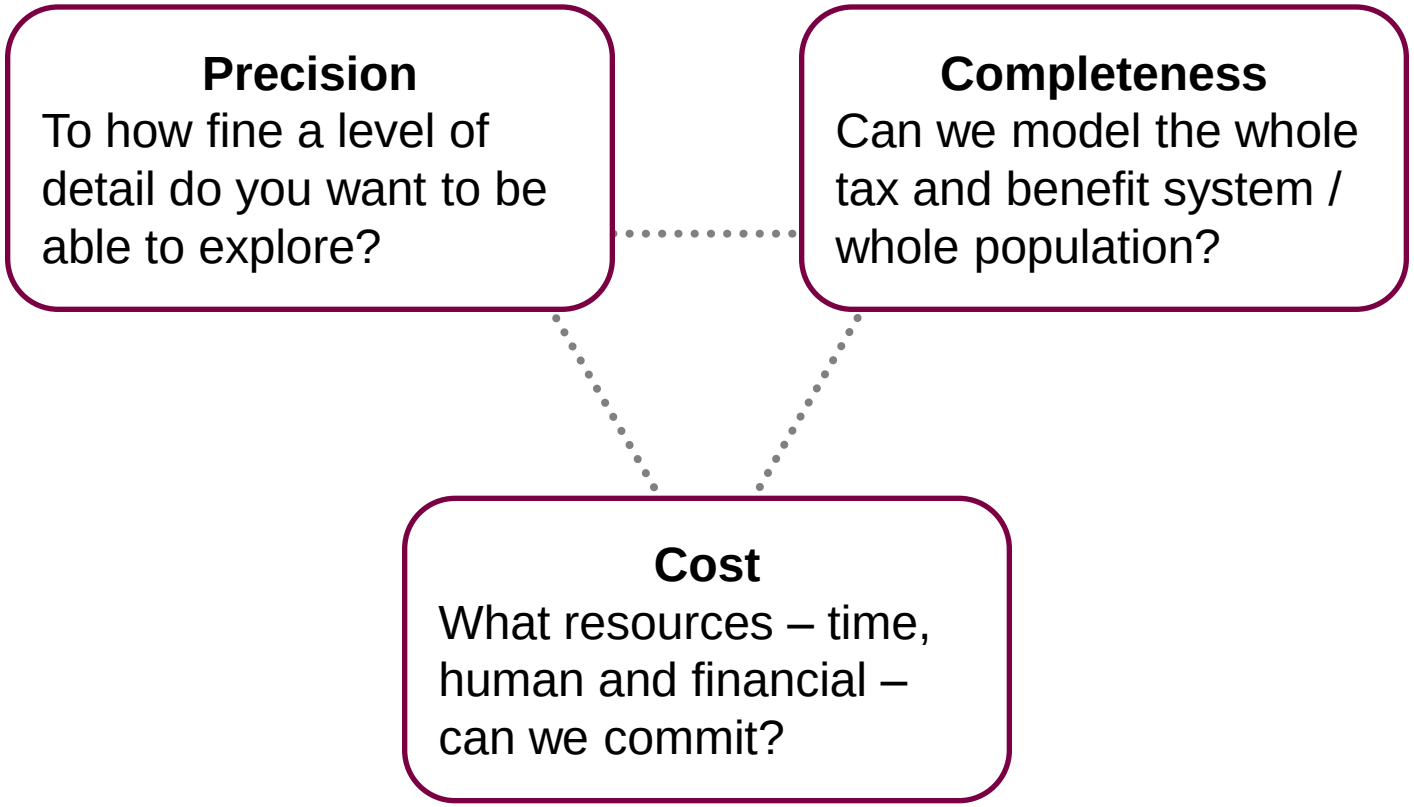
The key trade offs in modelling



Some terminology

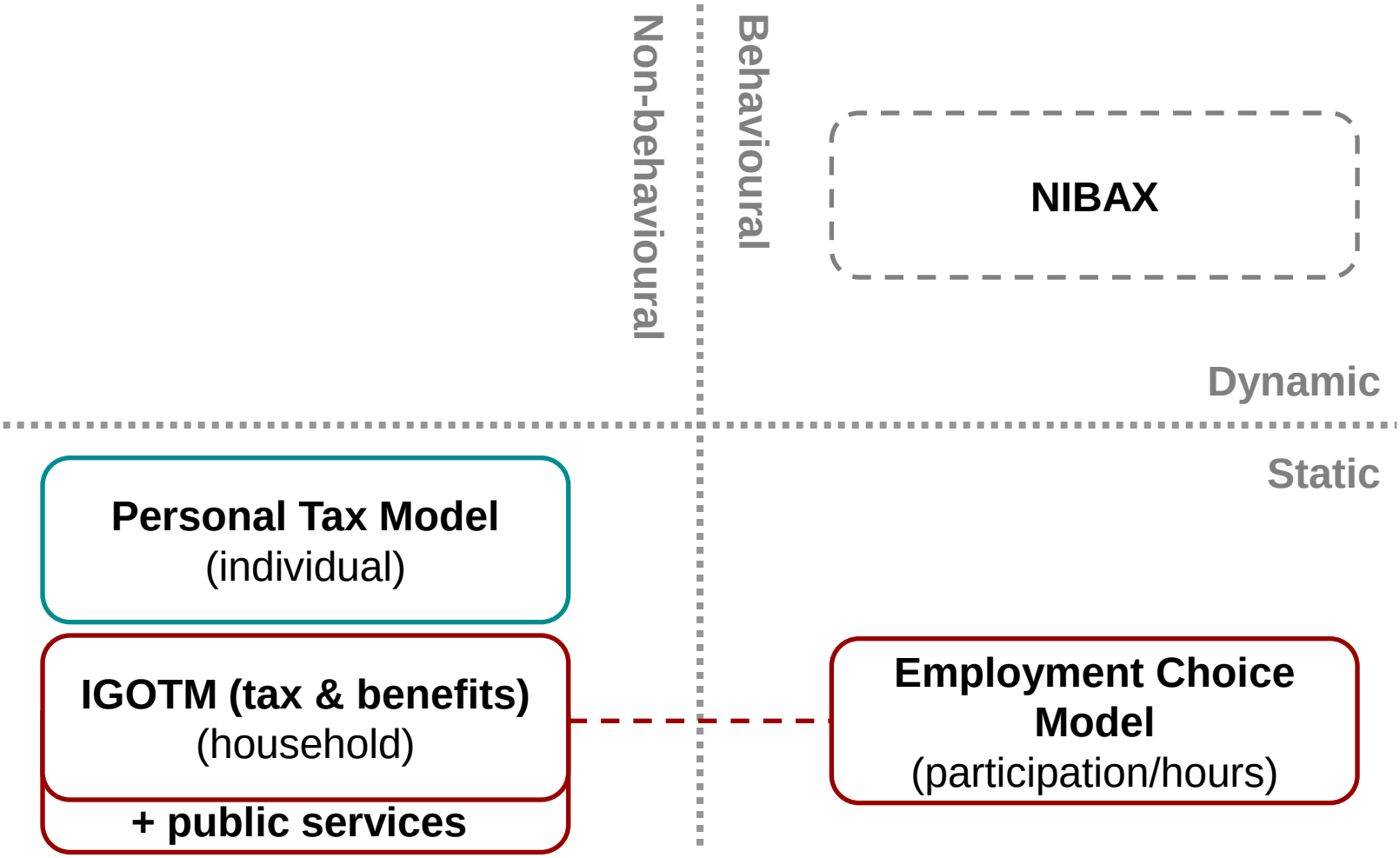
Static
Characteristics and composition of agents (e.g. age) do not change.

Dynamic
Characteristics and composition of agents can change as time passes.

Non-Behavioural
Agents behaviours (e.g. labour market participation) unchanged.

Behavioural
Agent behaviours change in response to changes in tax and benefit system.

Current and planned models



IGOTM

- IGOTM: Intra-Governmental Tax and Benefit Model
- Non-behavioural micro-simulation model, similar to IFS's TaxBen: estimates tax and benefits and effect of policy changes
- Commonly run from FRS and LCF survey datasets
- Works at individual and household level to capture different rules
- Covers most personal and indirect taxes, tax credits and benefits
- But sample sizes and nature of surveys used means some detail cannot be modelled (e.g. indirect taxes at individual level)
- Used to produce decile gains/losses charts included in Budgets
- Also provides underlying advice to Ministers to support decision making

IGOTM: the benefit of public services

- Since SR10, provide distributional analysis of public spending by income quintile using a spreadsheet model
- Intended to refine and update the approach: 18 month project to improve quality and flexibility of distributional analysis of spending on public services
- Developing IGOTM to estimate public service usage by individuals and households and allocate benefits in kind from frontline public services
- Using LCF data and, where necessary, a regression-based approach to predict usage of public services. Value based on unit cost of provision
- Treasury-led, working closely with colleagues across Whitehall, ONS, IFS and other experts in the field
- Aim to complete in summer/autumn 2013

Employment Choice Model

- IGOTM can model changes in work-incentives, but the measures often imperfect – real issue is whether people change work status or hours
- ECM is a behavioural add on to IGOTM to model effect of changes in the budget constraint on labour supply decisions
- Discrete choice model: evaluates budget constraint at 0 hours and selected positive hours
- Modelled wages for non-workers and five categories of work/leisure preferences all estimated from LFS data
- Produces labour supply estimates at extensive and intensive margins, relative to a baseline
- Primarily a tool for advising ministers, but is time consuming to run and quality assure outputs

NIBAX

- NIBAX: National Institute Benefit and Tax Model – behavioural, dynamic model
- Assumes households plan their consumption, savings and labour supply decisions considering the future and the uncertainties of their environment
- Starting point is simulated cross section of the current population based on data from the Wealth and Assets Survey
- Covers most personal taxes, tax credits and benefits; indirect tax to a limited extent.
- Expected to produce gains/losses charts by lifetime income decile and analysis of behavioural impacts of policy
- Based on a broader population – a full cross-section – than the IFS model, which focuses on a female cohort; but only has household level analysis
- NIBAX treats human capital (qualifications) as exogenous while IFS model has education and human capital investment as endogenous

Dynamic, behavioural models – an *ex ante* view

Opportunities

- Can overcome limitations with some snapshot surveys of income
  - Best example being the 'bottom 10 per cent' issue
  - Ways round it using expenditure, but better to look directly at lifetime income
- Labour supply effects can appear small in snapshot
  - Over life cycle, different income trajectories could have large effects

Challenges

- Inevitably some loss of 'precision' and 'completeness'
- Complexity
  - Diagnostics and explanation
  - Presenting results
- Behavioural parameter judgements
  - A potential source of tension and disagreement even in static behavioural modelling
  - Effects amplified in lifecycle models, as optimise behaviour each period

Concluding thoughts – the modelling

- Strong demand for good modelling
- Dynamic & behavioural models can add real value to policy making – important additions to our capability
- But inevitable trade offs compared to static/non-behavioural models
- Challenge is to make (all) modelling accessible – avoid the ‘black box’
- And microsimulation and micro-data are not the only approaches
  - Some approaches need to be modelled in a different way – evaluation of the 50p rate principally used aggregate data
  - With business taxes, we have to use more bespoke modelling approaches and judgements on investment decisions
  - Specimen or ‘case study’ approaches are simple and easily communicated

Concluding thoughts - presentation

- Presentation of microsimulation models often focuses on changes compared to a baseline tax and benefit system (‘winners’ and ‘losers’)
- But the baseline creates an interesting reference point issues
  - Baseline changes results: what is the right counterfactual to measure against?
  - Often compared to an indexed base
    - Correct economically, but not necessarily how people perceive the world
    - In life-cycle models, not necessarily sustainable
  - Tax and benefit system only one determinant of living standards
  - Focus on change misses underlying effects of tax and benefit system
  - Often does not include ‘benefits in kind’ (health, education, etc.)

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