Department for Work & Pensions

Model Development Division -our models and our data

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Outline

- Policy Simulation Model
- Pensim 2
- INFORM
- PENFORM
- Infrastructure Development

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Policy Simulation Model

What's the problem?

How could we estimate the effect of a new policy?
(Removal of Housing Benefit from the under-25s, say)

- Who would gain? Lose? Newly entitled?
- Poverty effects?
- Cost?
- Work incentives?

Analytical Tools

- Hypothetical Households
- Administrative Data
- Survey Data

What is the PSM?

- Combines
  - Survey data
  - Administrative data
  - Assumptions
  - Tax and benefit rules

- To create:
  - A static microsimulation model of the GB tax and benefit system

Example Usage – Universal Credit

- DWP UC analysts continue to use the PSM intensively in the detailed design of UC:
  - UC cuts across all benefits and tax credits
  - PSM can provide insight on take-up of benefit entitlement
  - UC distributional impacts important
  - Lots of “floaters-on” with UC
  - PSM provides quantitative data to inform analysis on behavioural effects

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Pensim 2

Objectives and background

- A model that estimates detailed pension incomes of a representative sample of pensioners in each year to 2060 (and now outputs to 2100 can be produced ‘with caution’)
- To improve understanding of long-term implications of current policy, and alternative policy scenarios, enabling detailed analysis of different groups, income distributions and income sources over time: ‘dynamic microsimulation’ approach necessary
- Recent uses include:
  - Single Tier State Pension analysis
  - NEST & automatic enrolment analysis
  - Undersaving analysis
  - data provided externally for the Public Service Pension Commission, Long-term Care Commission, Further Education Loans (BIS)

Data sources: base data

Base data sets the initial conditions for the simulation

No single source of data holds everything we need, so ‘fuse’ several

- **Family Resources Survey**
  - Cross-sectional survey
  - Current information on incomes and personal circumstances of individuals in private households
  - Lacks historic information and enough detail of pension income
- **Retired**: **DWP administrative data**
  - Payments of State Pension
  - 5% and 100% samples available
  - Fuse with FRS to get a more detailed breakdown of State Pension income
- **Not retired**: **Lifetime Labour Market Database (L2)**
  - 1% sample (800,000) of National Insurance records linked to tax and benefit administrative data
  - Fuse with FRS to get accrued rights to State Pension

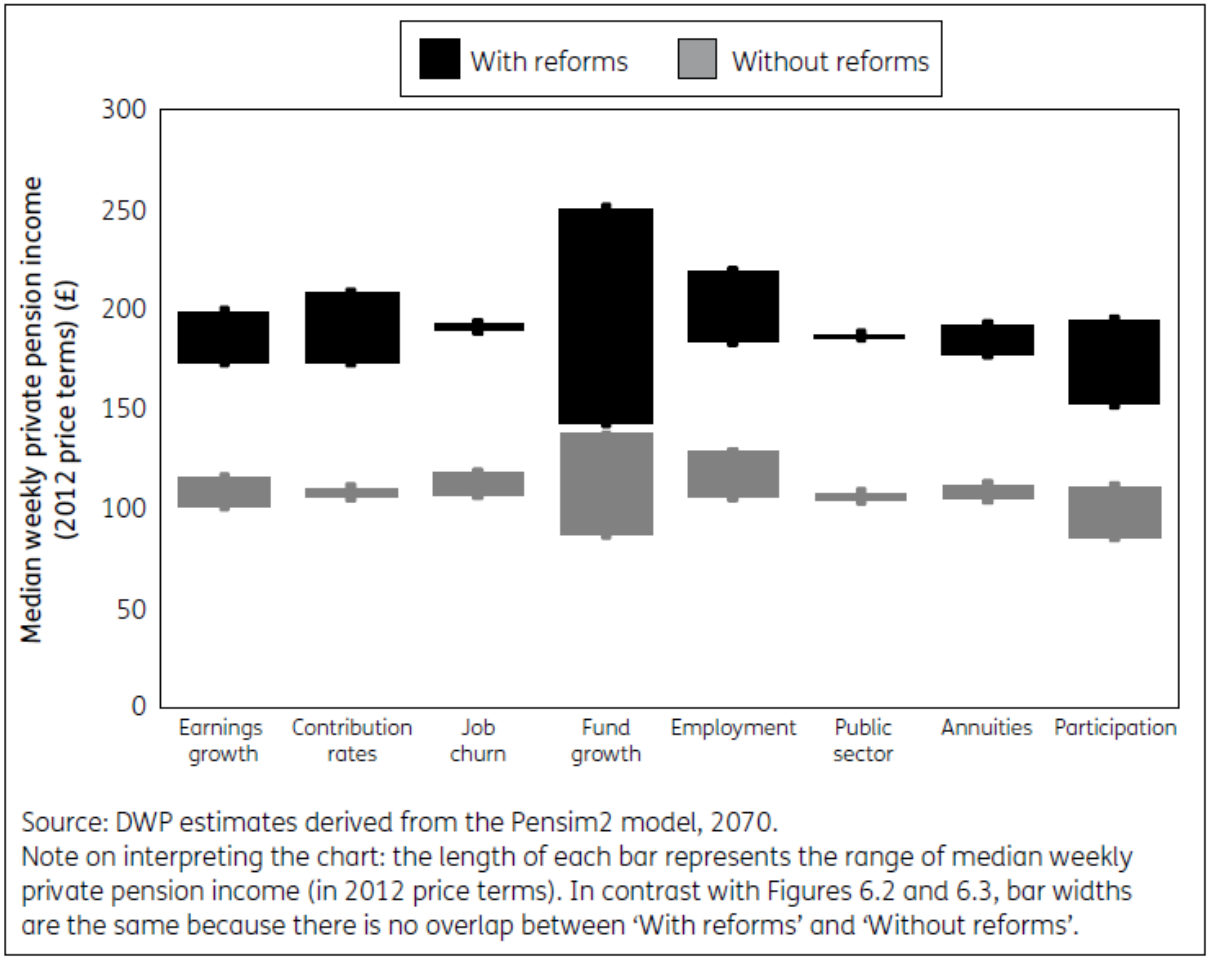
Data sources: forward simulation

A variety of data sources are used to estimate the probabilities of events occurring and to align the model to external totals.

- **English Longitudinal Study of Ageing** is used to estimate the probability a pensioner dying. The number of people dying is aligned to **ONS population projections**.
- **British Household Panel Survey** and the **Lifetime Labour Market Database** are used to estimate the probability of a person being in work. The number in work is aligned to **Office of Budget Responsibility estimates of employment**.
- **Annual Survey of Hours and Earnings** is used to estimate the contribution rates for private pension schemes.

What factors affect pension income?
Auto-enrolment counterfactual analysis

Figure 6.10 Median weekly private pension income arising from high and low scenarios at retirement, in 2012 price terms



Source: DWP estimates derived from the Pensim2 model, 2070.
Note on interpreting the chart: the length of each bar represents the range of median weekly private pension income (in 2012 price terms). In contrast with Figures 6.2 and 6.3, bar widths are the same because there is no overlap between 'With reforms' and 'Without reforms'.

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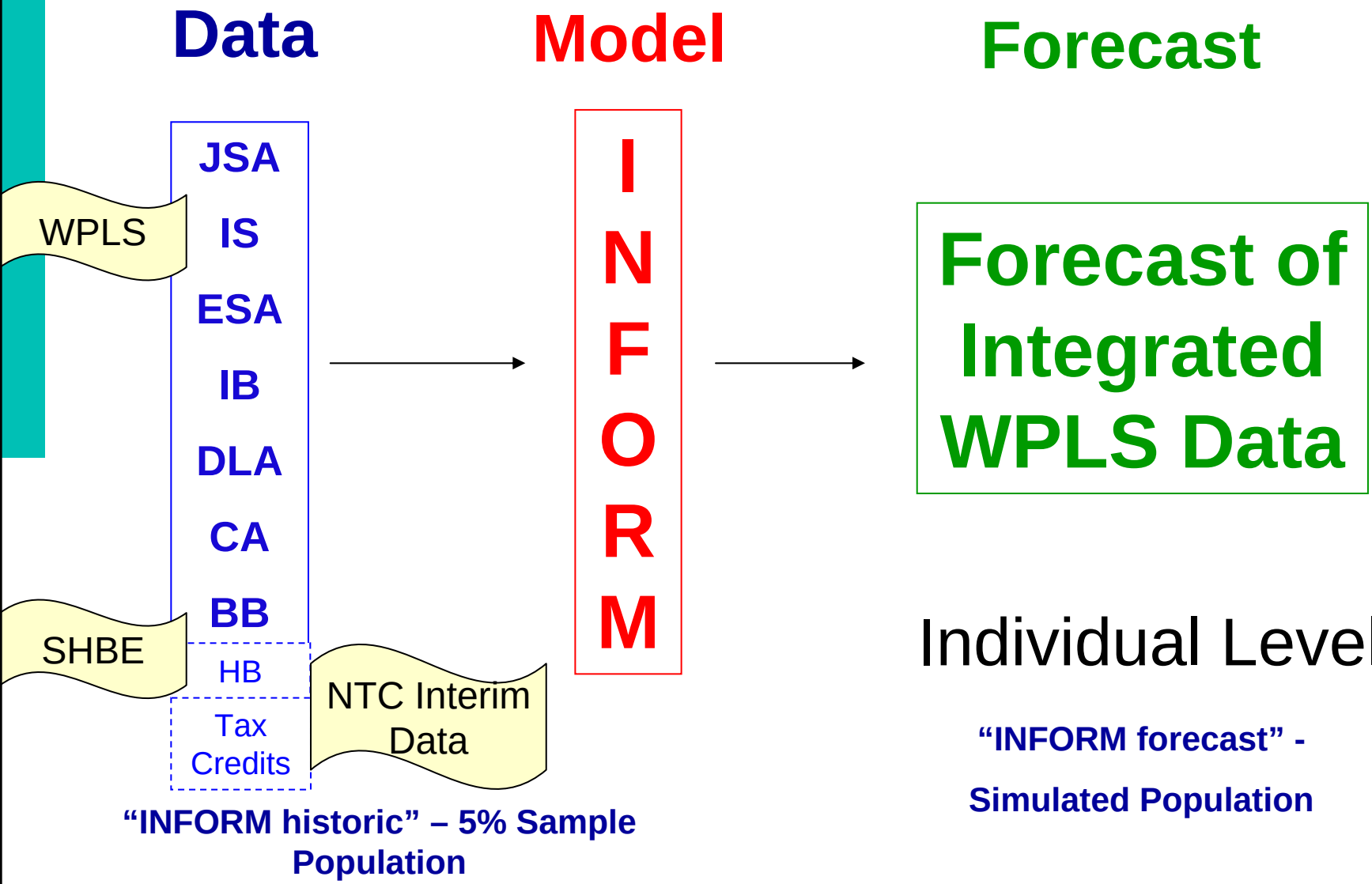
INFORM

The benefits of INFORM

- ✓ Have characteristics of future caseload – allows us to make better forecasts.
- ✓ Provide policy colleagues a more detailed breakdown of forecasts.
- ✓ Forecasts transitions across benefits
- ✓ Can model difficult policy changes more accurately - impact on entire working-age benefit system
- ✓ Can explore benefit combinations previously not able
- ✓ More efficient way of forecasting


Data
Model
Forecast
JSA
IS
ESA
IB
DLA
CA
BB
HB
Tax Credits
WPLS
SHBE
NTC Interim Data
I
N
F
O
R
M
Forecast of Integrated WPLS Data
Individual Level
"INFORM historic" – 5% Sample Population
"INFORM forecast" -
Simulated Population

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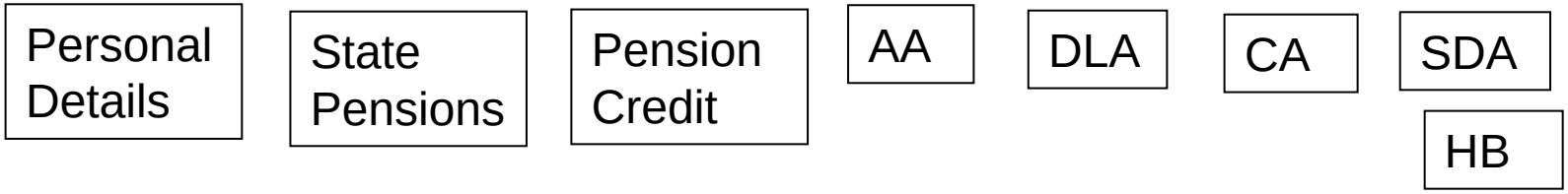
PENFORM

What is PENFORM?

- An integrated dynamic microsimulation model used to produce expenditure and caseload forecasts for most pensioner benefits in the medium-term (next 10 years)
- It will include Basic State Pension, Additional Pension, Graduated Retirement Benefit, Non-contributory State Pension, Pension Credit, Attendance Allowance, Disability Living Allowance, Carers Allowance, Housing Benefit; Single-Tier Pension and Housing Credit in Pension Credit
- It uses the GENESIS engine.
- This model is different to PENSIM2 as it will have a larger sample size, be based wholly on administrative data sources, and focused on the years to 2020/21 (not the long-term as PENSIM2 is).

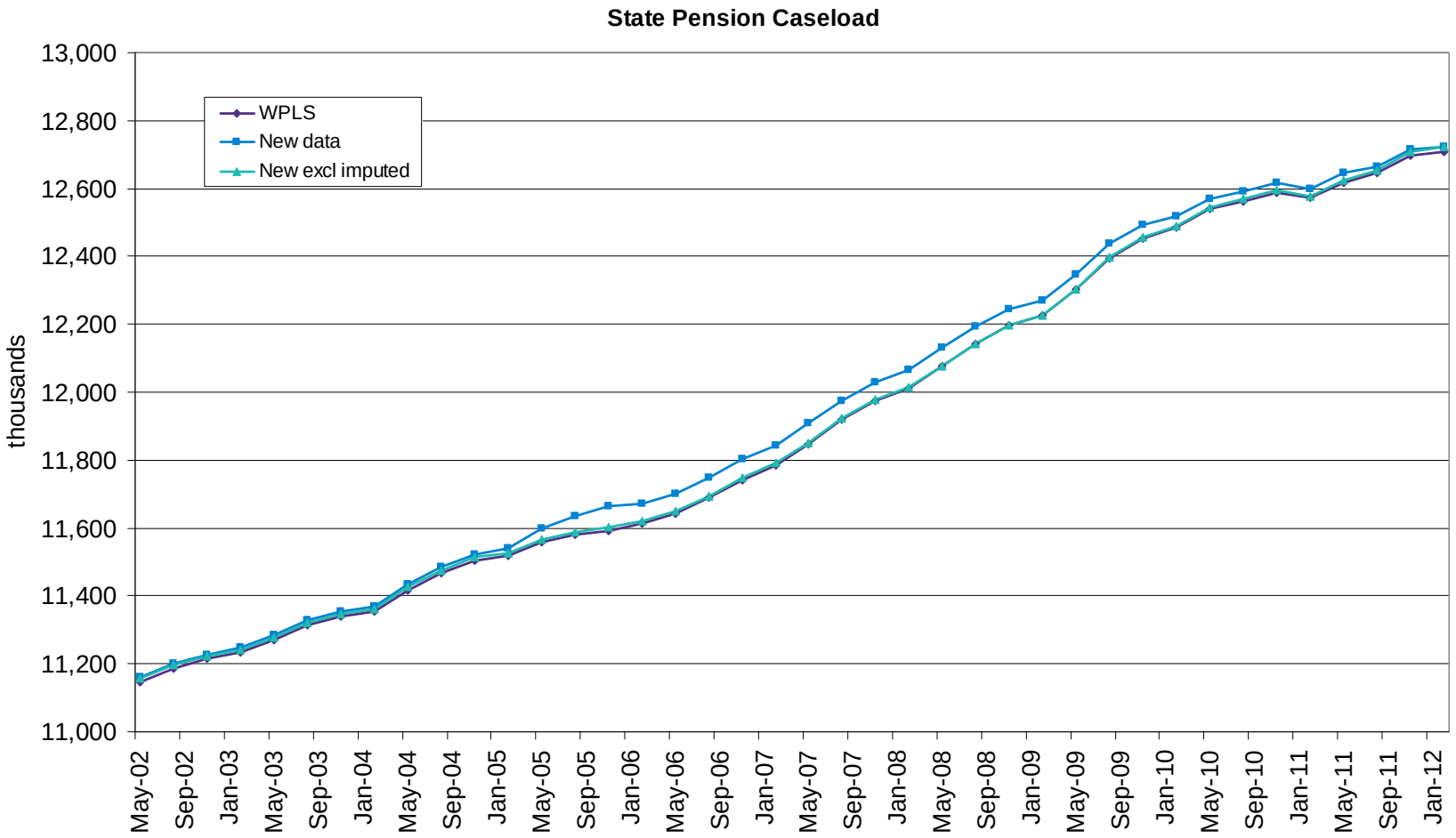
Longitudinal Data - Overview

- Structure similar to National Stats 'frozen' datasets
- One dataset per benefit, with another one for personal details
- However all quarters will be in same dataset – with one row per person per quarter. E.g. if someone is on AA for 12 quarters they will have 12 lines in the AA dataset.



- Combines information from WPLS (base), QSE, dead scan, L2 (gross AP) and SHBE (Housing Benefit)
- 5% sample of cases (gross AP only available for 1% sample)

Comparisons against Published data



WPLS is a 100% data sample; the PENFORM data is a 5% sample of this, so any differences between WPLS and PENFORM data excluding imputed cases are just due to sampling error. New data is higher as it includes imputed cases.

Infrastructure Development

- New team established after Transformation
- Objective: Ensure that MDD development strategy meets the needs of DWP
- Projects so far include:
  - Genesis Speed Improvement
  - TaxBen model
  - Review of Behavioural Modelling Capacity
  - Ad-hoc modelling projects
- PENFORM

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Any questions?