Policy Simulation Model

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Policy Simulation Model (PSM)

- **Why** was the PSM created?
- **What** is the PSM?
- **How** does the PSM work?
- **How** does the PSM use the FRS dataset?
- **Comparison** of FRS0809 v.s. PSM0809
- **Applying** the PSM to poverty analysis
Why was the PSM created?

Model impact of policy change on GB benefit units

- Gainers/losers/floaters on/floaters off Income Related Benefits (IRBs)…recently Tax Credits (TCs)
- Changes to average weekly income/benefit receipt
- Government expenditure/savings
- Impact on Interactions between IRBs and TCs
- Impact on Income Distribution for GB population
- Impact on poverty
What is the PSM?

Static Microsimulation Model of GB Tax & Benefit System

- **Static** – uses 2008/09 FRS data and **doesn’t change** personal or financial characteristics in simulated years.
- **Micro** – models **individuals** at ben unit & hh level
- **Simulation** – produces **results** of entitlement, from FRS year up to two years beyond current financial year.
- **Model** – **describes** the Great Britain population.
How does the PSM work?

Raw data
- FRS 2008/09
- Other data

PSM Input data
- Psmin2008/9
- Psmin2009/10
- Psmin2010/11
- Psmin2011/12
- Psmin2012/13

Tax/Ben Modules
- Psmbase2008/9
- Psmbase2009/10
- Psmbase2010/11
- Psmbase2011/12
- Psmbase2012/13

Change rules
- Alt dataset
How the PSM uses the FRS dataset

**Direct from FRS**
- Attendance Allowance
- Carer’s Allowance
- Disability Living Allowance
- Industrial Injuries Disablement Benefit
- Maternity Allowance
- Statutory Maternity, Paternity and Adoption Pay
- Statutory Sick Pay

**Eligibility from FRS, rates modelled in PSM**
- Bereavement benefits
- Short-term incapacity benefit
- Long-term incapacity benefit
- Contribution-based jobseeker’s allowance
- Retirement pension
- Severe disablement allowance

**Eligibility and rates modelled in PSM**
- Income support/income-based jobseeker’s allowance
- Housing benefit and council benefit
- Pension Credit
- Working tax credits
- Child tax credits
- Child Benefit
- Social fund payments (e.g. winter fuel payments)
- National insurance contributions
## Calculating Net Income…from gross income

### Taxable Income:
- Earnings
- Retirement Pension
- Contributory JSA
- Widow’s Benefit
- Occupational Pension
- Gross personal pension and trust payments
- Total amount of taxable interest (before tax)
- Rental income from other property
- Carer’s Allowance
- Statutory Sick Pay
- Statutory Maternity Pay
- Statutory Paternity Pay
- Statutory Adoption Pay

### Non-taxable Income:
- Non-taxable income of head and spouse
- War Disability Pension
- Income from external sources
- Maintenance Payments
- Attendance Allowance
- Severe Disability Allowance
- Govt. Training Scheme
- Maternity Allowance
- Any other NI/State benefits
- Industrial Injuries Disablement Benefit
- Trade Union/Friendly Soc Benefit
- Disability Living Allowance (care)
- Disability Living Allowance (mobility)
- Non-taxable interest income

### Benefits:
- Child Benefit
- Income Support
- Income-related ESA
- Pension Credit
- New Tax Credits (sum of WTC and CTC)
- Housing Benefit
- Council Tax Rebate (includes Second Adult Rebate)
- Winter Fuel Payments
- Value of Free TV licence to benefit units
- In Work Credits
- Return To Work Credits
## FRS0809 v.s. PSMBASE0809 datasets

<table>
<thead>
<tr>
<th></th>
<th>FRS0809</th>
<th>PSMBASE0809</th>
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</thead>
<tbody>
<tr>
<td>Population</td>
<td>UK-based</td>
<td>GB-based</td>
</tr>
<tr>
<td>Benefit unit characteristics</td>
<td>Reported FRS</td>
<td>Reported FRS</td>
</tr>
<tr>
<td>Non-income related benefits</td>
<td>Reported FRS</td>
<td>Some reported FRS (e.g. SMP, SSP)</td>
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<tr>
<td></td>
<td></td>
<td>Some modelled (e.g. IB, DLA)</td>
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<tr>
<td>Income-related benefits:</td>
<td>Reported FRS</td>
<td>Modelled entitlement based on GB tax and benefit rules.</td>
</tr>
<tr>
<td>PC, IS/ESA, HB, CTB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tax Credits: CTC/WTC</td>
<td>Reported FRS</td>
<td>Modelled entitlement based on GB tax and benefit rules.</td>
</tr>
<tr>
<td>Grossing</td>
<td>FRS Grossing</td>
<td>PSMGROSS based on age, sex, family and regional assumptions</td>
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<tr>
<td>Hourly wage</td>
<td>Reported FRS</td>
<td>Set to at least the minimum wage</td>
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Applying the PSM to poverty analysis

• Why we use PSM
• How we simulate income distribution & poverty
• Capabilities in projecting policy and scenarios
• Other output and uses
Why we use PSM for poverty analysis?

- Simulation of entire income distribution
- Capturing tax & benefit rules interaction
- Income & relative poverty line interaction
Simulating entire income distribution with PSM

- Take FRS sample of households
- Calc their tax liability & benefit entitlement
- Ensure HBAI income definition
- Uprate financial variables for given year
- Simulate take-up of entitlement
- Gross to GB population for given year
- PSM inc dist
From income distribution to poverty

Line up all individuals, each with equivalised household income, find median...

...take 60% of that and apply to each group’s distribution to see how many are poor
How do PSM and HBAI results compare?

<table>
<thead>
<tr>
<th></th>
<th>PSM 2008/09</th>
<th>HBAI 2008/09</th>
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<tbody>
<tr>
<td>All (BHC)</td>
<td>18%</td>
<td>18%</td>
</tr>
<tr>
<td>All (AHC)</td>
<td>22%</td>
<td>22%</td>
</tr>
<tr>
<td>Children (BHC)</td>
<td>21%</td>
<td>22%</td>
</tr>
<tr>
<td>Working Age (BHC)</td>
<td>16%</td>
<td>16%</td>
</tr>
<tr>
<td>Pensioners (AHC)</td>
<td>15%</td>
<td>16%</td>
</tr>
</tbody>
</table>
Projecting the path of poverty into the future

Proportion of Population below 60% of contemporary median (as at April 2010 budget)

Note: Illustrative results only
So, starting from base projections…

Note: Illustrative results only
We can simulate policy changes…

Proportion of group in low income after doubling of BSP

- < 50 per cent med
- 50-60 per cent of med
- 60-70 per cent of med

Note: Illustrative results only
And conduct scenario analysis…

Proportion of group in low income after increasing employment 10%

Note: Illustrative results only
Other poverty analysis variants and output

- Stretching earnings distribution
- Alternative price/wage inflation
- Take-up regime
- Benefit uprating regime
- Housing tenure
- Alternative demographics
- Policy costing and caseloads
Other recent uses

- Impacts of Universal Credit welfare reforms
- Distributional and cost analysis of SR10
- Experimental modelling of material deprivation
- Reforming HB in social sector
Conclusion

- Dawn: What the PSM is and how it works
- Rafal: Examples of how it is applied