Social Policy in Australia: Recent Directions and the Use of Microsimulation Models in the Policy Reform Process

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Support for a basic living standard: ‘income support’

- Cash benefits to individuals are main pillar of Australian welfare system

- Paid to those who can’t work, can’t find work or are not expected to work
  - Aged
  - Disabled
  - Unemployed
  - Sick
  - Carers
  - Sole parents
  - Students

- Constant evolution in system as our values change
  - Widow pension, ‘welfare to work’ changes
Structure of income support system

- Payments are income and asset tested (targeted to those in most need)
- ‘Pensions’ have more liberal income tests (as work disincentives less of a problem)
  - Age, disability, parenting payment single (child < 8)
- ‘Allowances’ have much harsher income tests (and may be activity tested)
  - Newstart, Youth Allowance
- Benefits are flat-rate, paid from general revenue
  - Quite different to the social insurance (earnings-related) systems of Europe
¼ of population receive income support, 2005

Family and child care payments

- Relatively high cash payments to families with children (Family Tax Benefit) (FTB)
- Around 60% of families with children receive FTB(A)
- Greatly expanded under Howard government (1996-2007)
  - Criticised as ‘middle class welfare’
  - Improved child poverty outcomes
  - Increased effective marginal tax rates
  - FTB(B) was non-means-tested, but ‘top end’ means test now introduced by Rudd Labor government
Introduction and expansion of other family-related payments

- Baby bonus – on birth of baby
  - was non-means-tested, now top end means test

- Child Care Benefit and Child Care Rebate
  - Illustrates crucial point that equivalent assistance can be delivered via cash transfer system or income tax system
  - A refundable tax credit can have the same impact as a cash transfer
  - Changes in recent 2008 budget: child care benefit no longer available to high income families, but CCR up from 30 to 50% of child care out-of-pocket costs
Numerous other minor cash transfers to serve particular purposes

- Rent assistance
- Pharmaceutical allowance
- Utilities allowance
- Seniors concession allowance
- Telephone allowance
- Mobility allowance
- Pensioner Education Supplement etc etc
- Plus ‘health’ concession cards (passport to concessional pharmaceuticals)
Welfare payments as % of GDP have been at around the same level since 1993.

Source: Brennan, 2008
Australia’s expenditure on its welfare state is relatively modest.
Income tax side

● ‘Progressive’ tax schedule means that marginal tax rates increase as income increases
  ● Top marginal rate of 45c in $ above $180,000 + 1.5% Medicare levy

● Also a multitude of tax concessions for specific groups
  ● Senior Australians Tax Offset
  ● Low Income Tax Offset
  ● Mature Australians Tax Offset
  ● Pensioner Rebate/Beneficiary Rebate
Challenges facing Australian welfare state

- Population ageing
- High effective marginal tax rates (work incentives)

- Currently major reviews underway
  - Harmer pension review (reports February 2009)
  - Henry tax review (reports December 2009)
in % of population aged 65 years +

Resulting in much higher health and aged care costs in Australia

**Projected Commonwealth spending by category**

<table>
<thead>
<tr>
<th>Category</th>
<th>2006-07</th>
<th>2046-47</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>3.8</td>
<td>7.3</td>
</tr>
<tr>
<td>Aged care</td>
<td>0.8</td>
<td>2.0</td>
</tr>
<tr>
<td>Social security</td>
<td>6.7</td>
<td>7.1</td>
</tr>
<tr>
<td>Education</td>
<td>1.9</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Source: Treasury Intergenerational Report, 2007 Budget Papers
Projected gap between Commonwealth revenue and outlays in Australia

Using microsimulation models in policy process
What are microsimulation models?

- **Based on microdata sets**
  - Records of individual people or households
  - Usually large – thousands of records
    - Sample surveys (Australian Bureau of Statistics), or
    - Administrative data

- **Allow detailed assessment of impact of change**
  - On individuals
  - On groups of individuals
  - On whole population
  - On government budgets
Static tax-transfer models
Static models widely used across developed world

- Static tax-transfer models show *morning after* impact of a policy change
- EUROMOD for EU15 (and soon 25)
- SPSD/M for Canada
- LOTTE for Norway
- GLADHISPANIA for Spain
  - See Gupta and Harding (2007) for summaries of 22 microsimulation models in use across the world
STINMOD – Australian model

- Static microsimulation model replicating rules of the Australian tax, social security, & family payments systems
- ‘Day after’ impact, no behavioural change
- Developed by NATSEM, first release STINMOD 94, latest is STINMOD 08
- Shows impact of possible policy changes
  - Fiscal (revenue and expenditure)
  - Distributional (winners and losers)
  - Effective marginal tax rates (EMTRs)
## Income Tax Scale Steps

### y2008

<table>
<thead>
<tr>
<th>Step</th>
<th>Income</th>
<th>Marginal Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step One</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Step Two</td>
<td>6000</td>
<td>0.15</td>
</tr>
<tr>
<td>Step Three</td>
<td>30000</td>
<td>0.30</td>
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<tr>
<td>Step Four</td>
<td>80000</td>
<td>0.40</td>
</tr>
<tr>
<td>Step Five</td>
<td>180000</td>
<td>0.45</td>
</tr>
<tr>
<td>Step Six</td>
<td></td>
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</tr>
<tr>
<td>Step Seven</td>
<td></td>
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<tr>
<td>Step Eight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step Nine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step Ten</td>
<td></td>
<td></td>
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</tbody>
</table>

### OK, Refresh, Cancel, Flat Tax
### ESTIMATED SIMULATION OUTCOMES

**Impact on 2008-09 of tax changes announced in 2007 election campaign**

<table>
<thead>
<tr>
<th></th>
<th>Number of Families</th>
<th>Proportion</th>
<th>$ Change in Average Weekly Income</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Winners</strong></td>
<td>7,010,000</td>
<td>63.4</td>
<td>18.6</td>
</tr>
<tr>
<td><strong>Losers</strong></td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>No change</strong></td>
<td>4,048,800</td>
<td>36.6</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11,058,700</td>
<td>100.0</td>
<td>11.8</td>
</tr>
</tbody>
</table>

Note: This and the following two slides also include the impact of other tax changes announced in the election campaign.
ESTIMATED ANNUAL PORTFOLIO OUTCOMES

Impact on 2008-09 of tax changes announced in 2007 election campaign

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>Base Outcome $m</th>
<th>Simulation Outcome $m</th>
<th>Difference $m</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outlays</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FaCS</td>
<td>69115.591</td>
<td>69115.591</td>
<td>0.00</td>
</tr>
<tr>
<td>DVA</td>
<td>5777.709</td>
<td>5777.709</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Revenue</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAX OFFICE</td>
<td>106093.743</td>
<td>99308.174</td>
<td>-6785.57</td>
</tr>
</tbody>
</table>

Net Outcome 6785.57
## Outcome by Family Type and Income

**Estimated Change in Family Disposable Income - $ pw**

**Impact on 2008-09 of tax changes announced in 2007 election campaign**

Outcome: ALL  
Population: All Recipients

<table>
<thead>
<tr>
<th>Weekly Taxable Income</th>
<th>Married no childr.</th>
<th>Married + children</th>
<th>Sole Parent</th>
<th>Single Adult</th>
<th>ALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 150</td>
<td>0.20</td>
<td>0.58</td>
<td>0.00</td>
<td>0.00</td>
<td>0.05</td>
</tr>
<tr>
<td>150-299</td>
<td>0.26</td>
<td>0.33</td>
<td>0.08</td>
<td>0.71</td>
<td>0.56</td>
</tr>
<tr>
<td>300-449</td>
<td>0.45</td>
<td>2.09</td>
<td>1.62</td>
<td>5.62</td>
<td>3.32</td>
</tr>
<tr>
<td>450-599</td>
<td>1.47</td>
<td>7.03</td>
<td>6.39</td>
<td>8.68</td>
<td>5.59</td>
</tr>
<tr>
<td>600-749</td>
<td>10.78</td>
<td>15.96</td>
<td>16.99</td>
<td>19.06</td>
<td>17.23</td>
</tr>
<tr>
<td>750-899</td>
<td>17.43</td>
<td>19.09</td>
<td>19.57</td>
<td>20.30</td>
<td>19.60</td>
</tr>
<tr>
<td>900-1049</td>
<td>20.27</td>
<td>19.58</td>
<td>19.33</td>
<td>18.63</td>
<td>19.17</td>
</tr>
<tr>
<td>1050-1199</td>
<td>21.33</td>
<td>18.82</td>
<td>15.86</td>
<td>12.77</td>
<td>16.69</td>
</tr>
<tr>
<td>1200-1349</td>
<td>23.78</td>
<td>20.35</td>
<td>13.47</td>
<td>11.54</td>
<td>17.84</td>
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<tr>
<td>1350-1499</td>
<td>26.20</td>
<td>21.61</td>
<td>13.69</td>
<td>11.54</td>
<td>19.45</td>
</tr>
<tr>
<td>1500+</td>
<td>26.45</td>
<td>24.85</td>
<td>15.42</td>
<td>11.54</td>
<td>23.65</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>13.15</td>
<td>21.07</td>
<td>7.32</td>
<td>7.96</td>
<td>11.80</td>
</tr>
</tbody>
</table>
Trends in effective marginal tax rates (EMTRs)

- With ageing population and labour shortages, EMTRs are a major policy issue.
- Australia wants to reduce work disincentives – issue being considered in current Treasury Tax Review.
- EMTRs measure the proportion of an additional dollar of earnings that is lost to both income tax and the reduction of income-tested government benefits (e.g. Newstart, Aged Pension, Family Tax Benefit (FTB)).
- Australian system highly means-tested:
  - In 2006-07, 7.1% of working-age Australians (910,000 people) faced EMTRs of 50c in the dollar or more.
  - Up from 4.8% in 1996-97.
Proportion of each family type with high EMTRs

Note: ‘High’ EMTRs defined here as > 50 %. Source: Harding et al, 2006
Health microsimulation models
NATSEM developing many health models

- MediSim – model of Australia’s Pharmaceutical Benefits Scheme
- HealthMod – cost and use of doctors (Medicare)
- HospMod – cost and use of public and private hospitals
- Diabetes model – long-term costs and benefits of diabetes prevention and management strategies
- DYNOPTA – optimising ageing and compressing morbidity – dynamic model of 45+ yr olds
- NHMRC Economics and Financing of Health project
  - With Monash Uni
  - Linking MONASH macro model to NATSEM’s micro models
Dynamic models: simulating the future
History

- Treasury Intergenerational Report highlighted policy changes coming
- Model required to look at equity issues
  - Modelling underlying the IGR is at an aggregated level
  - New modelling capacity required to assess:
    - the distributional impact of future changes
    - the inter-generational redistributive impacts
    - the likely capacity to pay of different groups
- Dynamic microsimulation provides both aggregate and distributional outcomes
The Australian Population and Policy Simulation Model (APPSIM)

- 5 year project, started in late 2005
- Funded by the ARC and 12 Commonwealth Govt agencies
- Similar to SESIM (Sweden), DESTINIE (France), MOSART (Norway), DYNACAN (Canada), PENSIM (UK)
Processes to be modelled within APPSIM

- Health & Aged Care
- Demographics
- Taxation
- Household Formation & Movement
- Social Security
- Education & Training
- Household Assets & Debt
- Labour Force
- Other Income & Expenditure
- Earnings
- Housing

Green shading denotes initial module construction completed or well underway.
Parameter Screen

**General**

- **Simulation Start Year:** 2001
- **Simulation Finish Year:** 2011
- **Number of Obs to Use:** 5,000

**Done**
APPSIM Sample Output – Disability Status

Some restriction, Mild disability, Moderate disability, Severe disability, Profound disability

NOT FOR QUOTATION, Experimental projection output only, APPSIM still under development, December 2008
Spatial microsimulation models
Spatial Microdata and Microsimulation

- Combine the information-rich ABS survey data with the geographically disaggregated Census data
- Using ‘spatial microsimulation’ to create detailed unit record data for small areas (synthetic spatial microdata)
Application 1: Analysis of Specific Population Sub-Groups

- Allows – for small areas:
  - identification and analysis of specific socio-demographic groups and characteristics
  - analysis at various population levels: e.g. persons, income units, households

- Examples – children in low income families; children in jobless families; unskilled youth, those in housing stress
Application 2: Predict spatial impact of a policy change

- Spatial microdata now linked with NATSEM’s existing microsimulation models to model the immediate distributional/revenue impact of a policy change

- Link synthetic spatial output to STINMOD and model changes to the tax and transfer system for small geographic areas
- Currently modelling changes in Commonwealth Rent Assistance, income tax, social security and family payments
  - spatialMSM and HOUSEMOD models
Where did the $5bn of 2005-06 tax cuts go?

<table>
<thead>
<tr>
<th>Tax threshold</th>
<th>Tax rate</th>
<th>Tax threshold</th>
<th>Tax rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>$6,000</td>
<td>0.17</td>
<td>$6,000</td>
<td>0.15</td>
</tr>
<tr>
<td>$21,600</td>
<td>0.3</td>
<td>$21,600</td>
<td>0.3</td>
</tr>
<tr>
<td>$58,000</td>
<td>0.42</td>
<td>$63,000</td>
<td>0.42</td>
</tr>
<tr>
<td>$70,000</td>
<td>0.47</td>
<td>$95,000</td>
<td>0.47</td>
</tr>
</tbody>
</table>
Estimated average tax cut per household per week, Sydney SLAs, 2005-06

±$20

$3.50 - $9.50 pw (lightest)
$9.51 - $13.70
$13.71 - $19.30
$19.31 - $34.10 pw (darkest)
Evidence based policy making

- Growing demand for quantitative decision support tools
- Not good enough today to do ‘back of the envelope’ estimates of impact of policy change
- Log on to www.natsem.canberra.edu.au and join our free email update list
  - 2nd General conference of International Microsimulation Association, Ottawa, June 2009
  - International Microsimulation Association (free to join) - http://www.microsimulation.org/
Selected references

Dynamic microsimulation


+ see the papers describing the construction of APPSIM at the Working Paper section of the NATSEM website – www.natsem.canberra.edu.au

STINMOD and its use in public policy


Other selected references

Child Social Exclusion Index (small area index of social exclusion specifically developed for children)


Health models


Spatial Microsimulation


Other selected references

**CuSP Model (spatial microsimulation model of Centrelink’s customers)**


**CAREMOD (spatial microsimulation model of aged care needs)**


**HOUSEMOD (spatial microsimulation model of housing)**


* Means available on NATSEM website at [www.natsem.canberra.edu.au](http://www.natsem.canberra.edu.au)

**Other References Cited in Presentation**


