

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

Presentation to 'Research Institute of Economy, Trade and Industry' Seminar Series, Tokyo

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26 January 2009

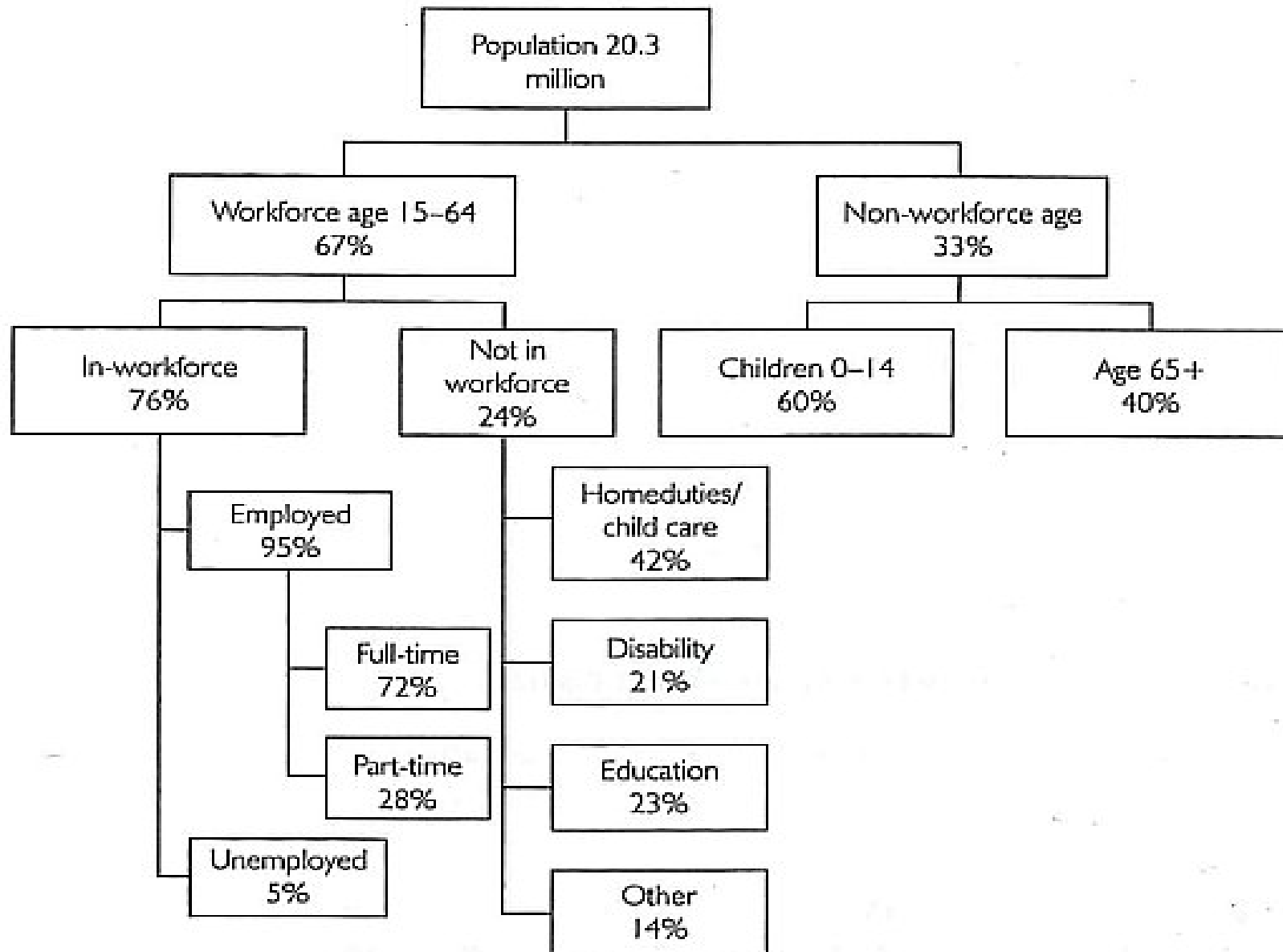
# Support for a basic living standard: 'income support'

- 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

# 1/4 of population receive income support, 2005



\*Excluding family support payments. Source for chart: Abelson, 2008, p. 555.

# 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

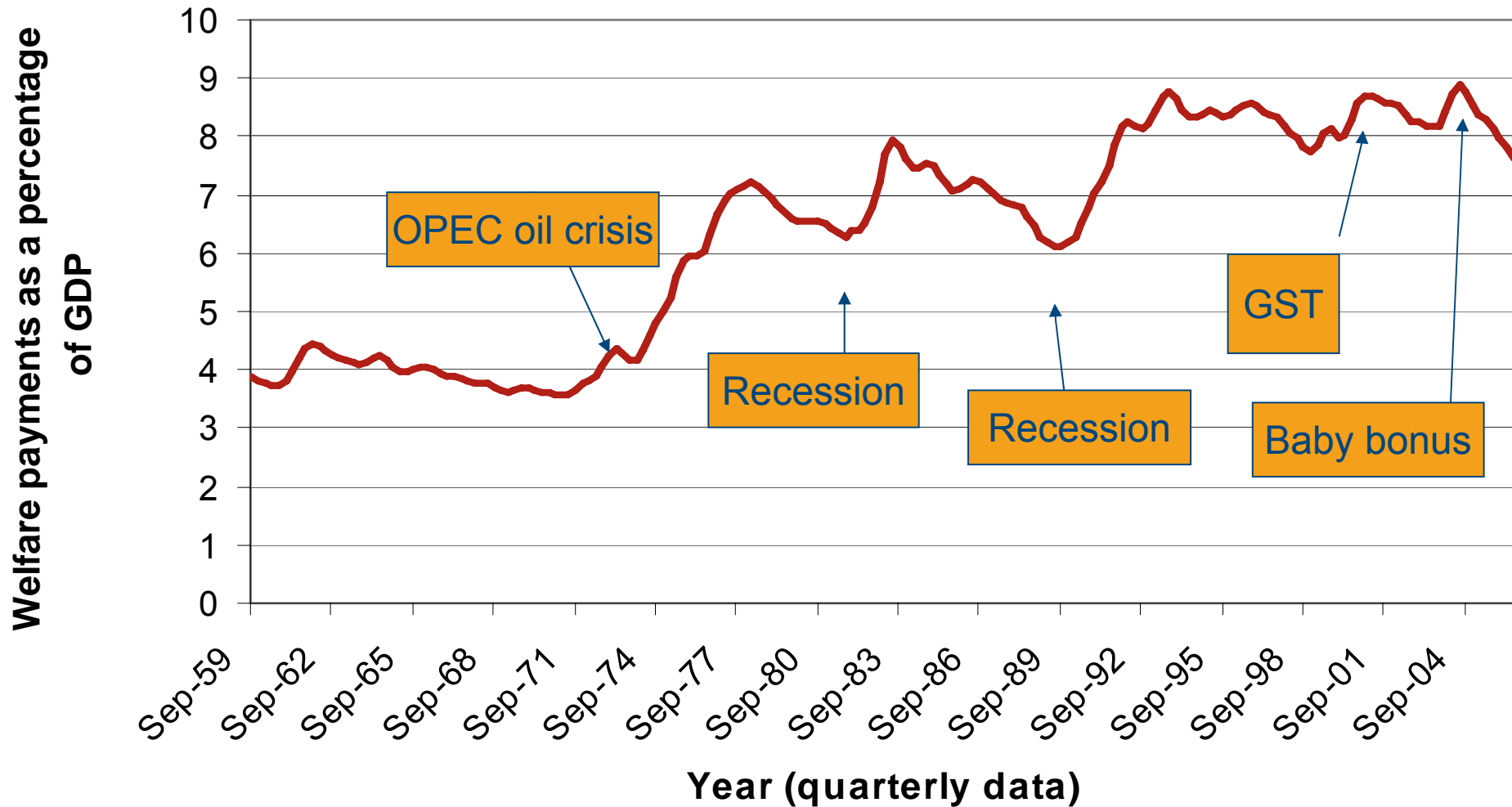
# Introduction and expansion of other family-related payments

- 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)

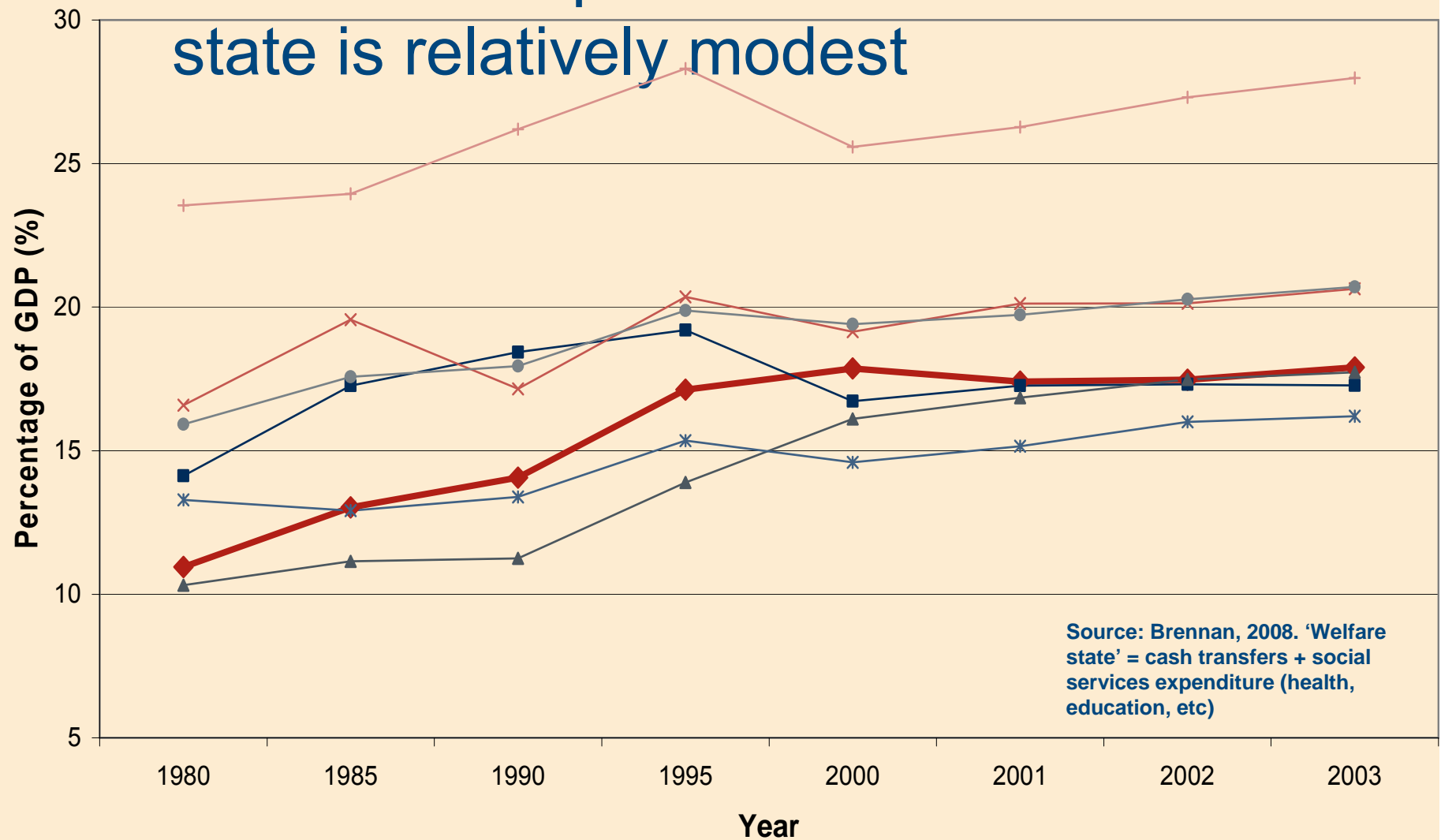
# Welfare payments as % of GDP have been at around the same level since 1993



Source: Brennan, 2008



# Australia's expenditure on its welfare state is relatively modest



Source: Brennan, 2008. 'Welfare state' = cash transfers + social services expenditure (health, education, etc)

- ◆ Australia
- Canada
- ▲ Japan
- ✕ United Kingdom
- \* United States
- OECD 28
- + Scandinavian Average

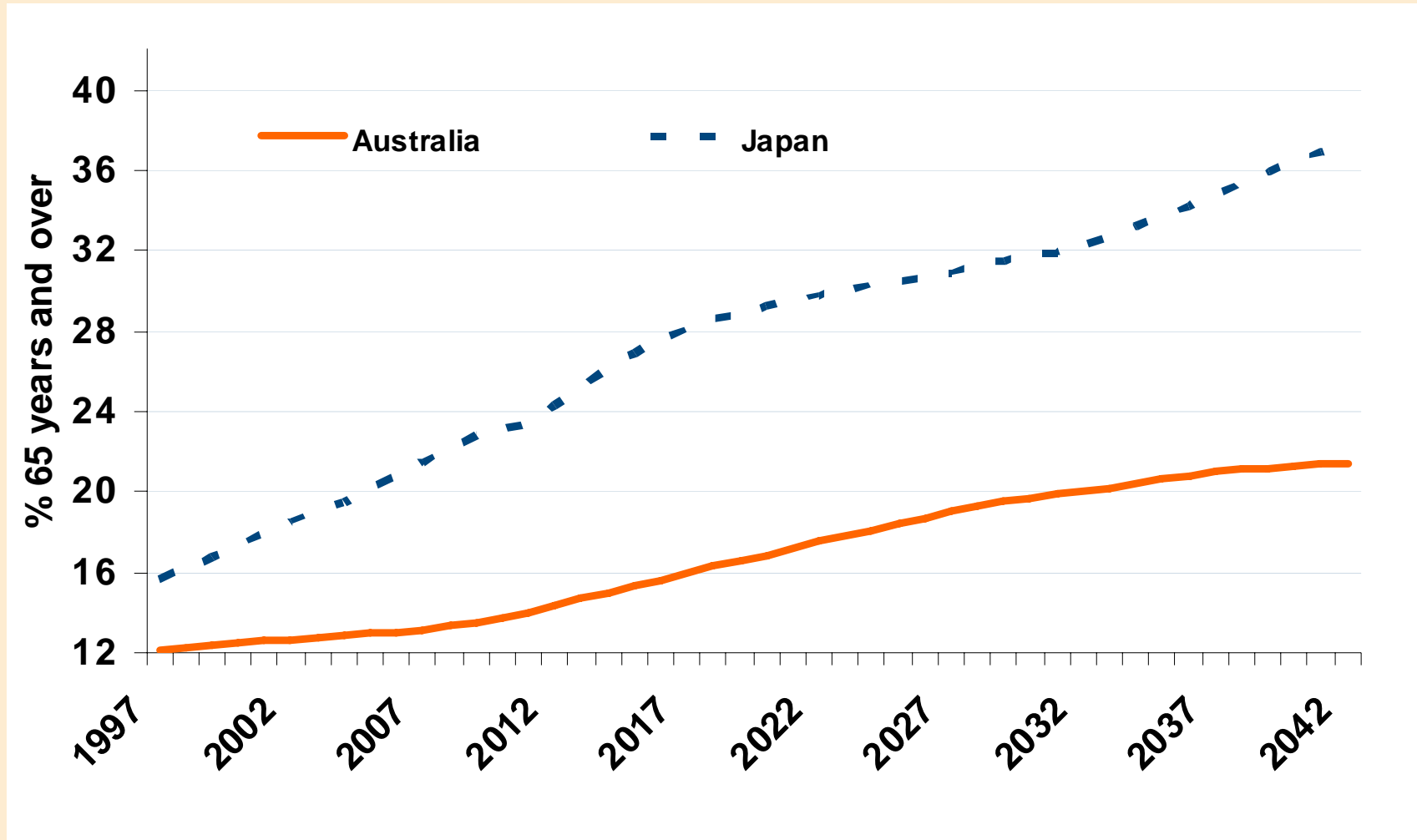
# Income tax side

- '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

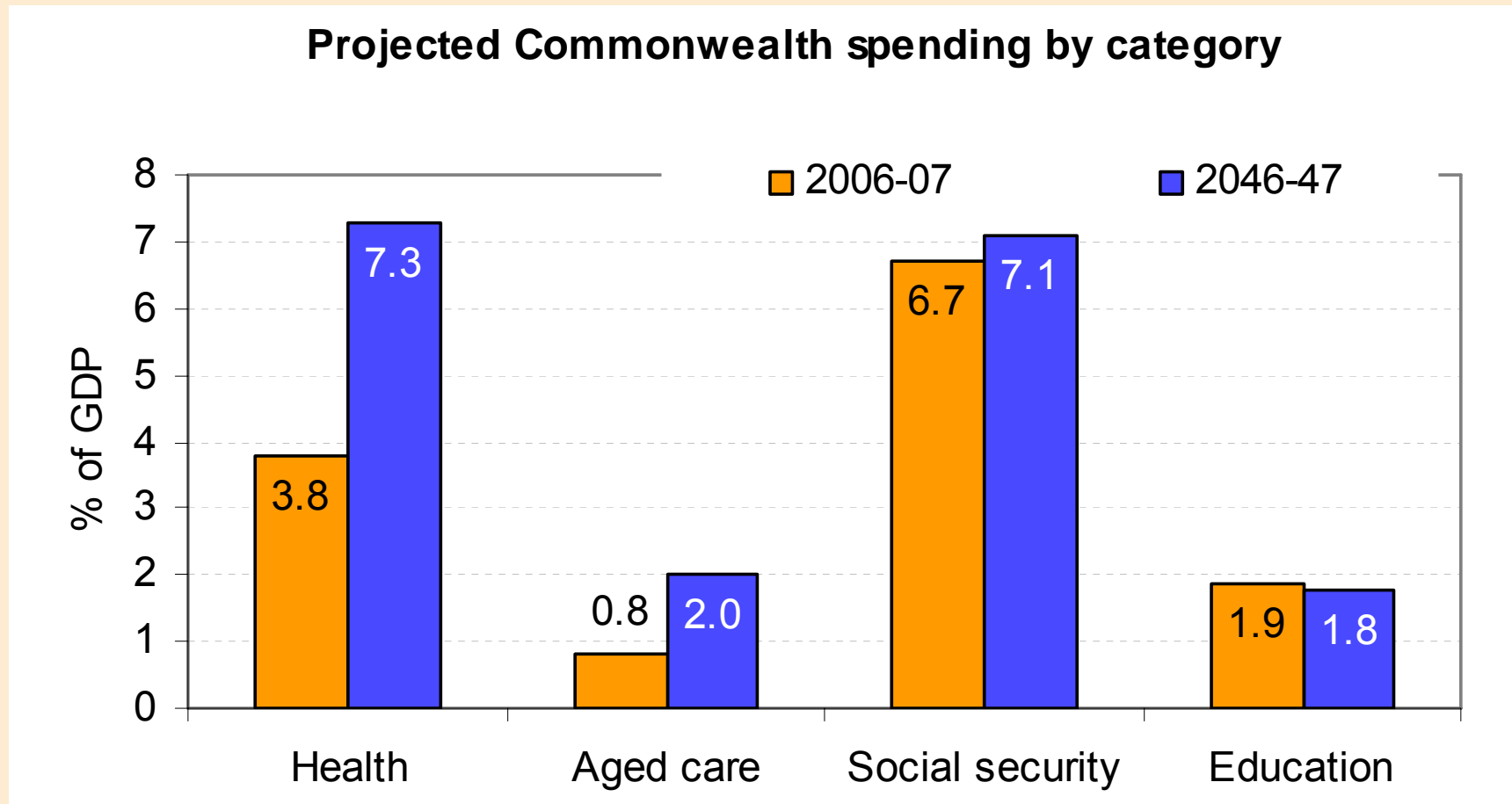
- Population ageing
- High effective marginal tax rates (work incentives)
- Currently major reviews underway
  - Harmer pension review (reports February 2009)
  - Henry tax review (reports December 2009)

# ↑ in % of population aged 65 years +



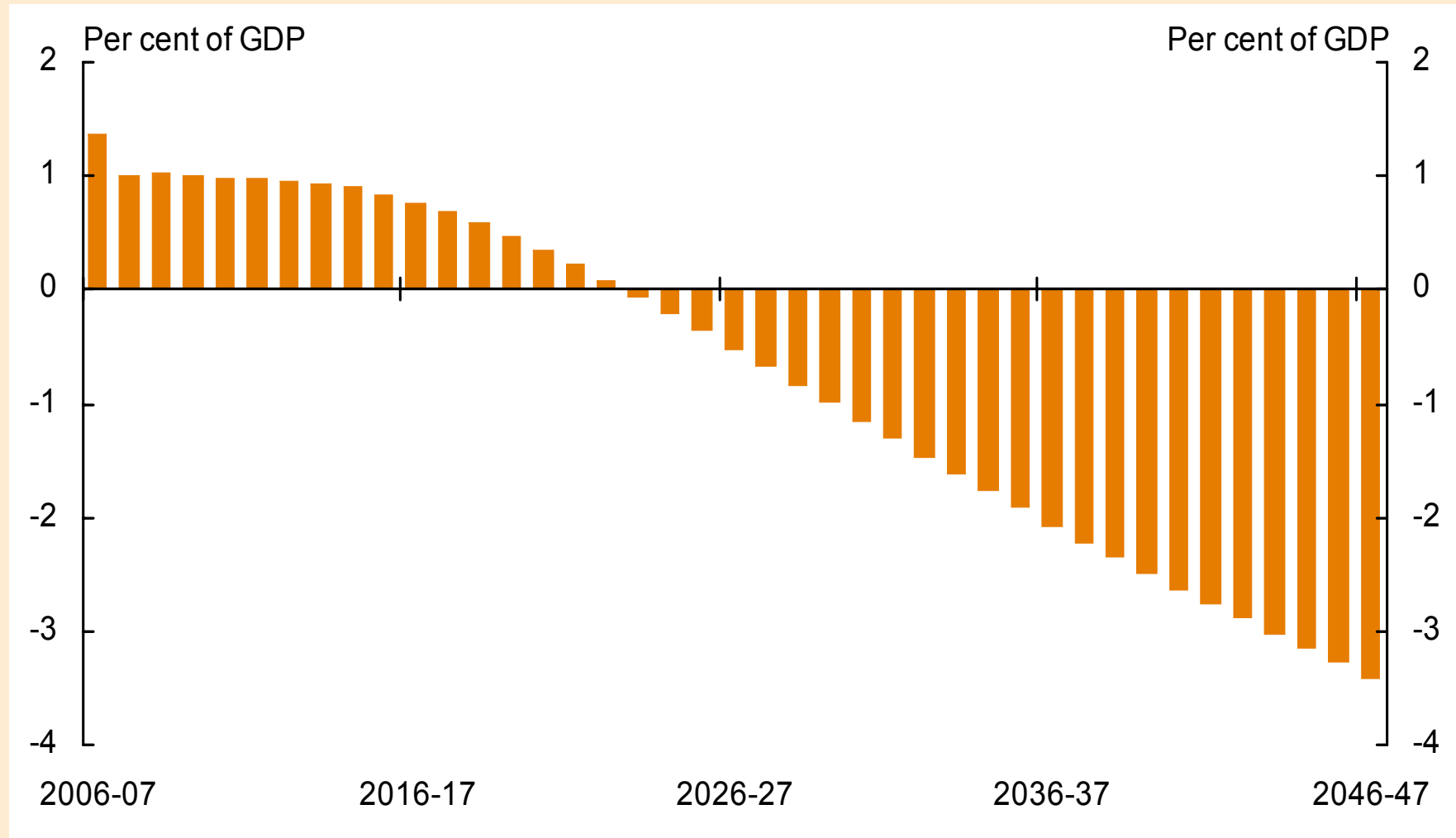
Sources: Australian Bureau of Statistics + <http://www.e-stat.go.jp/SG1/estat/eStatTopPortalE.do> + Kaneko et al.(2008) based on medium-variant mortality (with medium-variant fertility)

# Resulting in much higher health and aged care costs in Australia

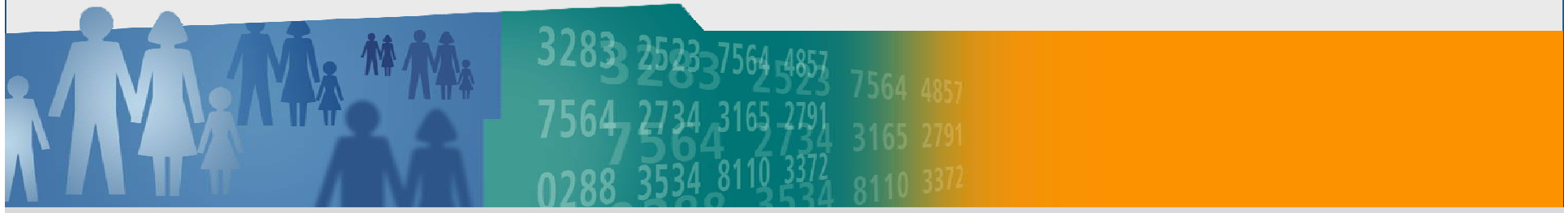


Source: Treasury *Intergenerational Report*, 2007 Budget Papers

# Projected gap between Commonwealth revenue and outlays in Australia



Source: Treasury Intergenerational Report 2007 ([www.treasury.gov.au/igr](http://www.treasury.gov.au/igr))

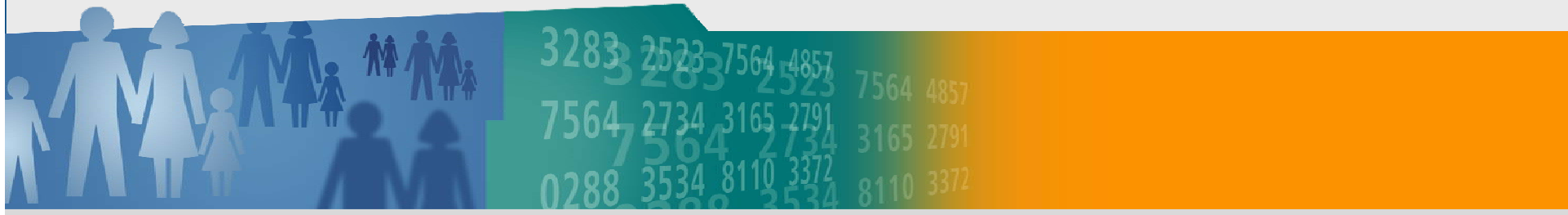


# Using microsimulation models in policy process

# 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

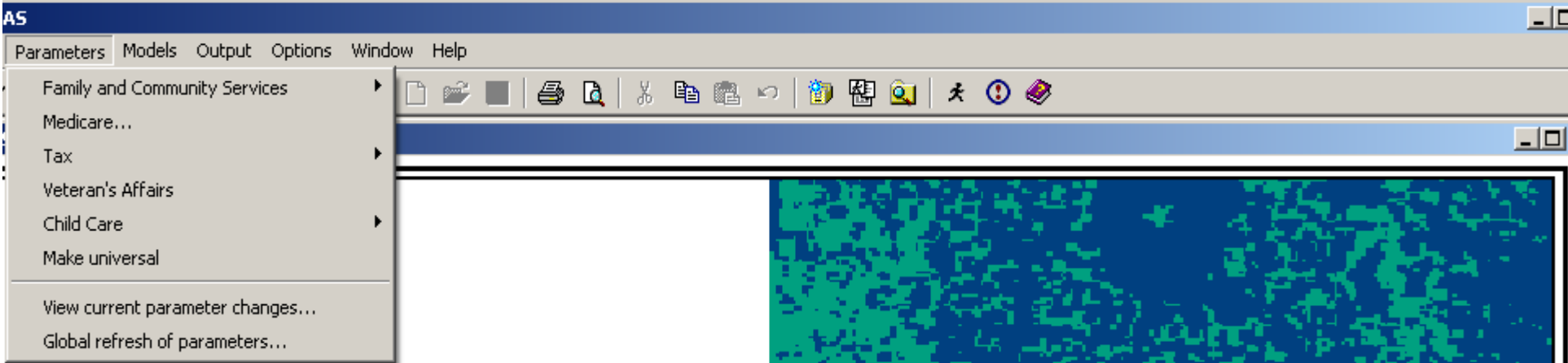
# Static models widely used across developed world

- **Static tax-transfer models show *morning after* impact of a policy change**
- **EUROMOD for EU15 (and soon 25)**
- **TRIM model in US (<http://trim3.urban.org/>)**
- **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)



07  
R E L E A S E

STINMOD

National Centre for Social and Economic Modelling  
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# INCOME TAX SCALE PARAMETERS

## Income Tax Scale Steps

y2008

	Income	Marginal Rate
Step One	: 0	0.00
Step Two	: 6000	0.15
Step Three	: 30000	0.30
Step Four	: 80000	0.40
Step Five	: 180000	0.45
Step Six	: .	.
Step Seven	: .	.
Step Eight	: .	.
Step Nine	: .	.
Step Ten	: .	.

OK

Refresh

Cancel

Flat Tax

: 0	0.00
: 6000	0.15
: 34000	0.30
: 80000	0.40
: 180000	0.45
: .	.
: .	.
: .	.
: .	.
: .	.

**ESTIMATED SIMULATION OUTCOMES**

**Impact on 2008-09 of tax changes announced in 2007 election campaign  
y2008**

	<b>Number of Families</b>	<b>Proportion</b>	<b>\$ Change in Average Weekly Income</b>
<b>Winners</b>	<b>: 7,010,000</b>	<b>63.4</b>	<b>18.6</b>
<b>Losers</b>	<b>: 0</b>	<b>0.0</b>	<b>0.0</b>
<b>No change</b>	<b>: 4,048,800</b>	<b>36.6</b>	<b>0.0</b>
<b>Total</b>	<b>: 11,058,700</b>	<b>100.0</b>	<b>11.8</b>

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 campai

y2008

Portfolio	Base Outcome \$m	Simulation Outcome \$m	Difference \$m
<b>Outlays</b>			
FaCS	69115.591	69115.591	0.00
DVA	5777.709	5777.709	0.00
<b>Revenue</b>			
TAX OFFICE	106093.743	99308.174	-6785.57
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  
 y2008

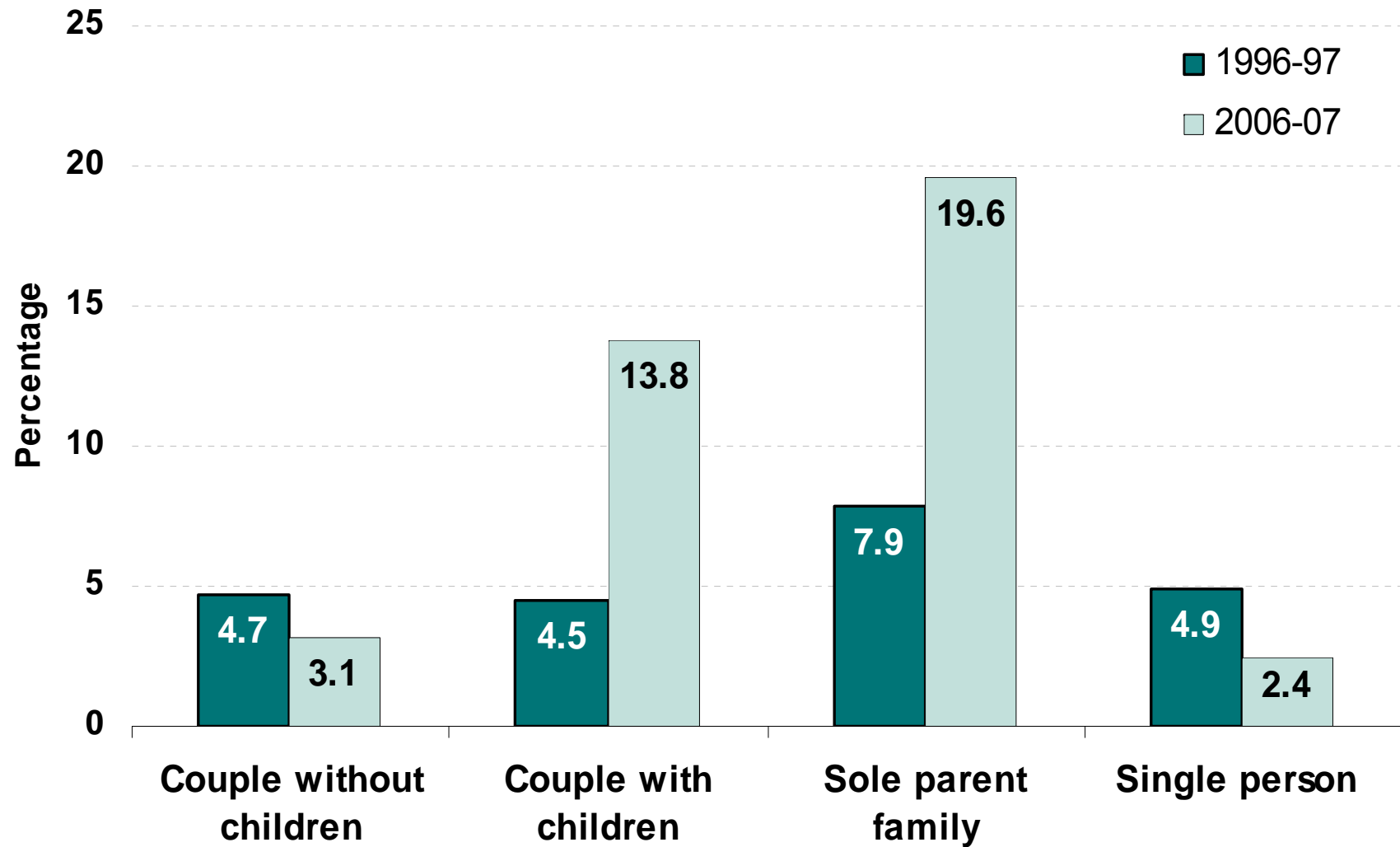
Weekly Taxable Income	Family Type				ALL
	Married no childr.	Married + children	Sole Parent	Single Adult	
< 150	0.20	0.58	0.00	0.00	0.05
150-299	0.26	0.33	0.08	0.71	0.56
300-449	0.45	2.09	1.62	5.62	3.32
450-599	1.47	7.03	6.39	8.68	5.59
600-749	10.78	15.96	16.99	19.06	17.23
750-899	17.43	19.09	19.57	20.30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



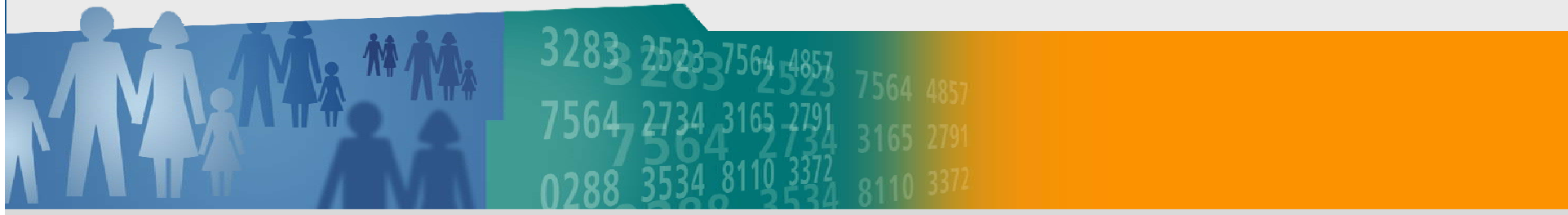
# Trends in effective marginal tax rates (EMTRs)

- 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



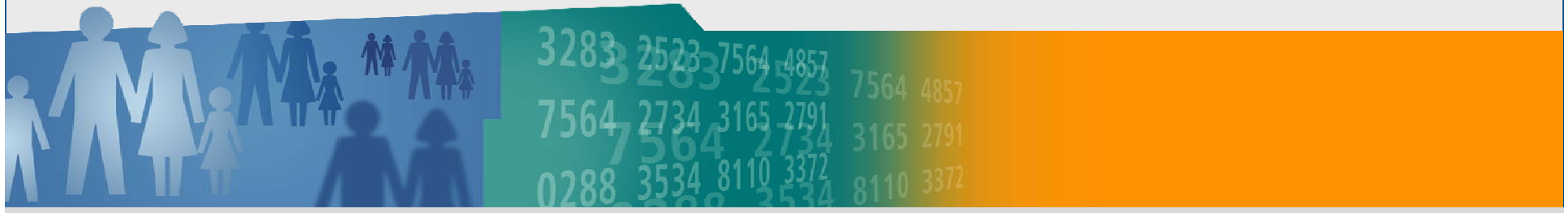
Note: 'High' EMTRs defined here as > 50 %. Source: Harding et al, 2006



# 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

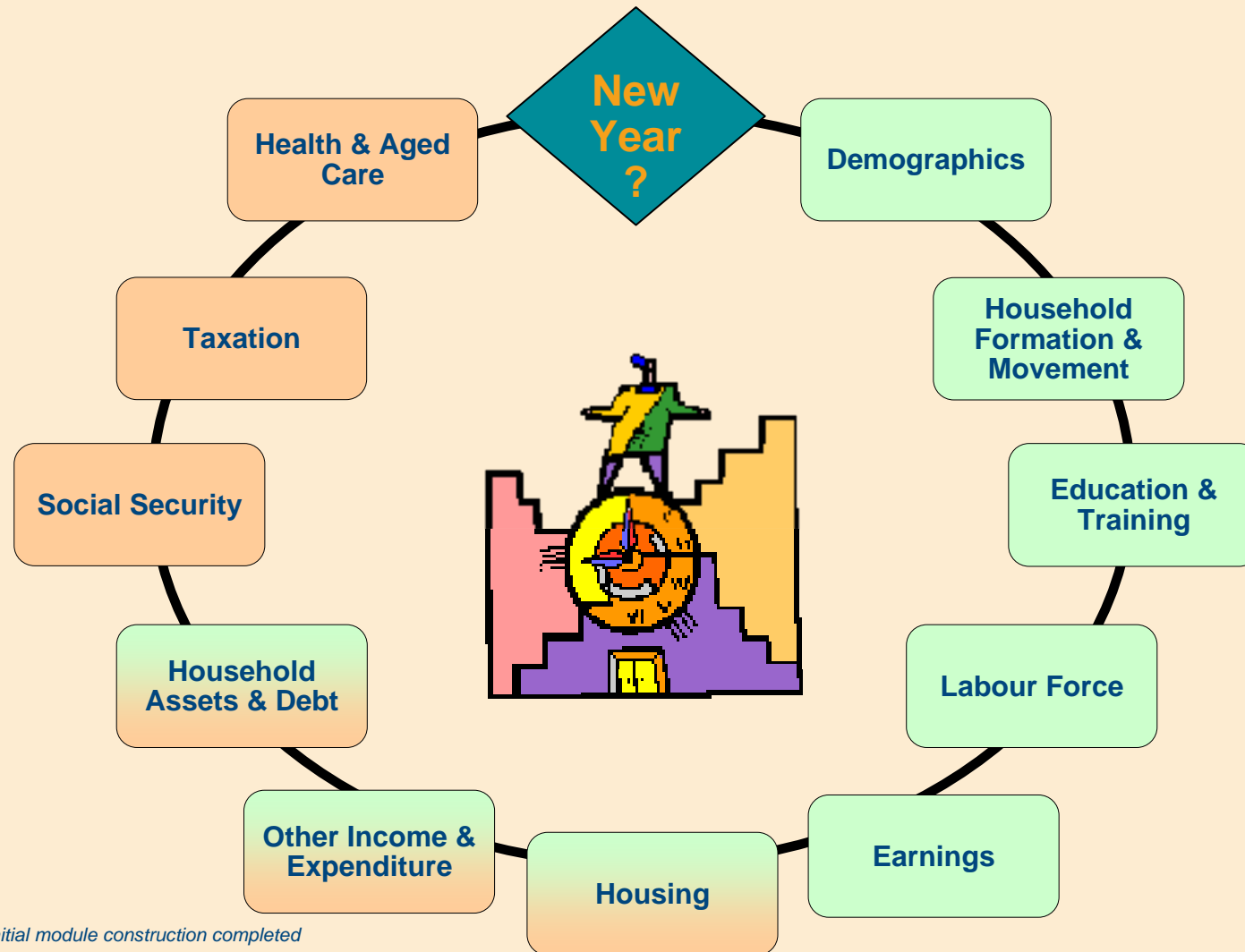
- Treasury Intergenerational Report highlighted policy changes coming
- Model required to look at equity issues
  - Modelling underlying the IGR is at an aggregated level
  - New modelling capacity required to assess:
    - the distributional impact of future changes
    - the inter-generational redistributive 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)



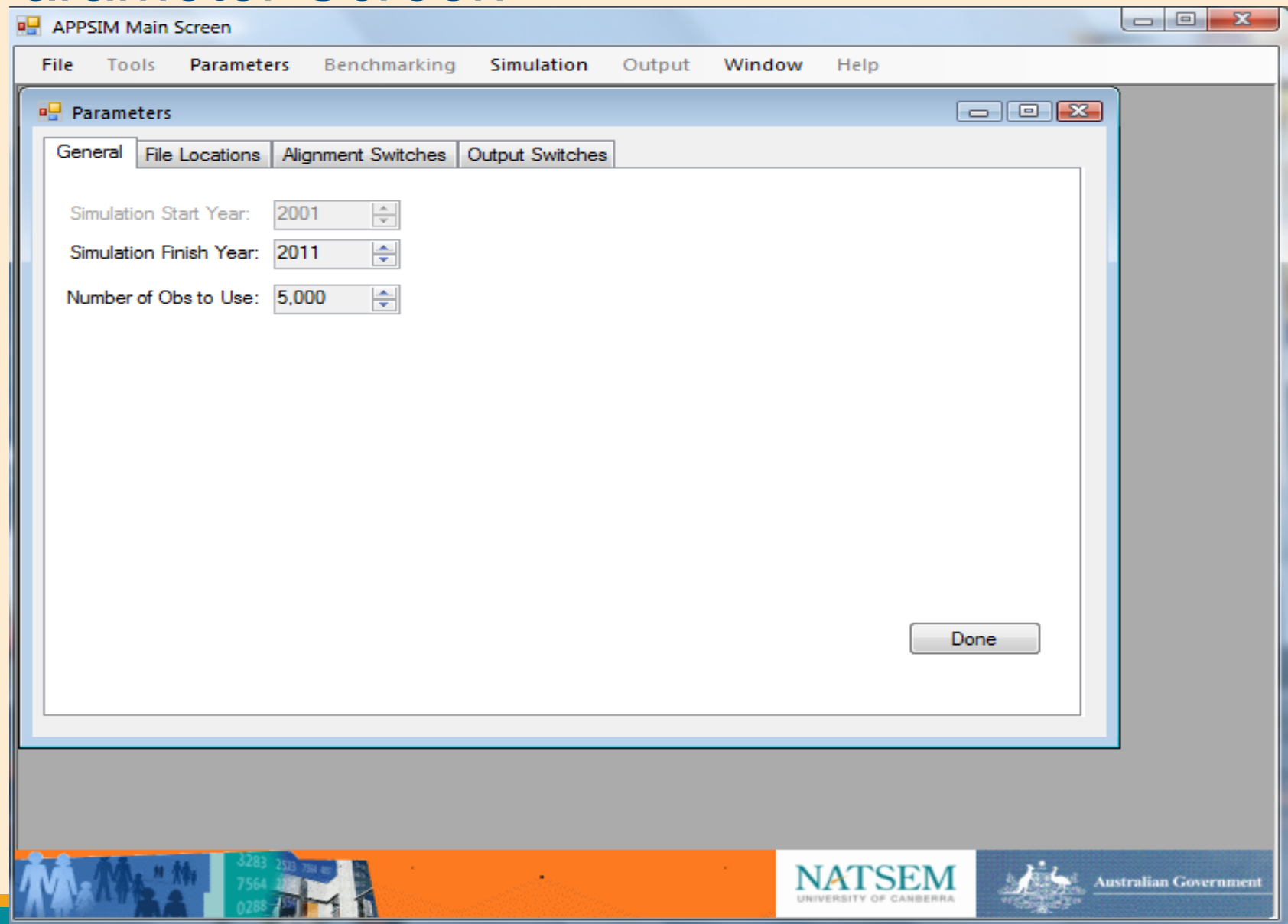
# Processes to be modelled within APPSIM



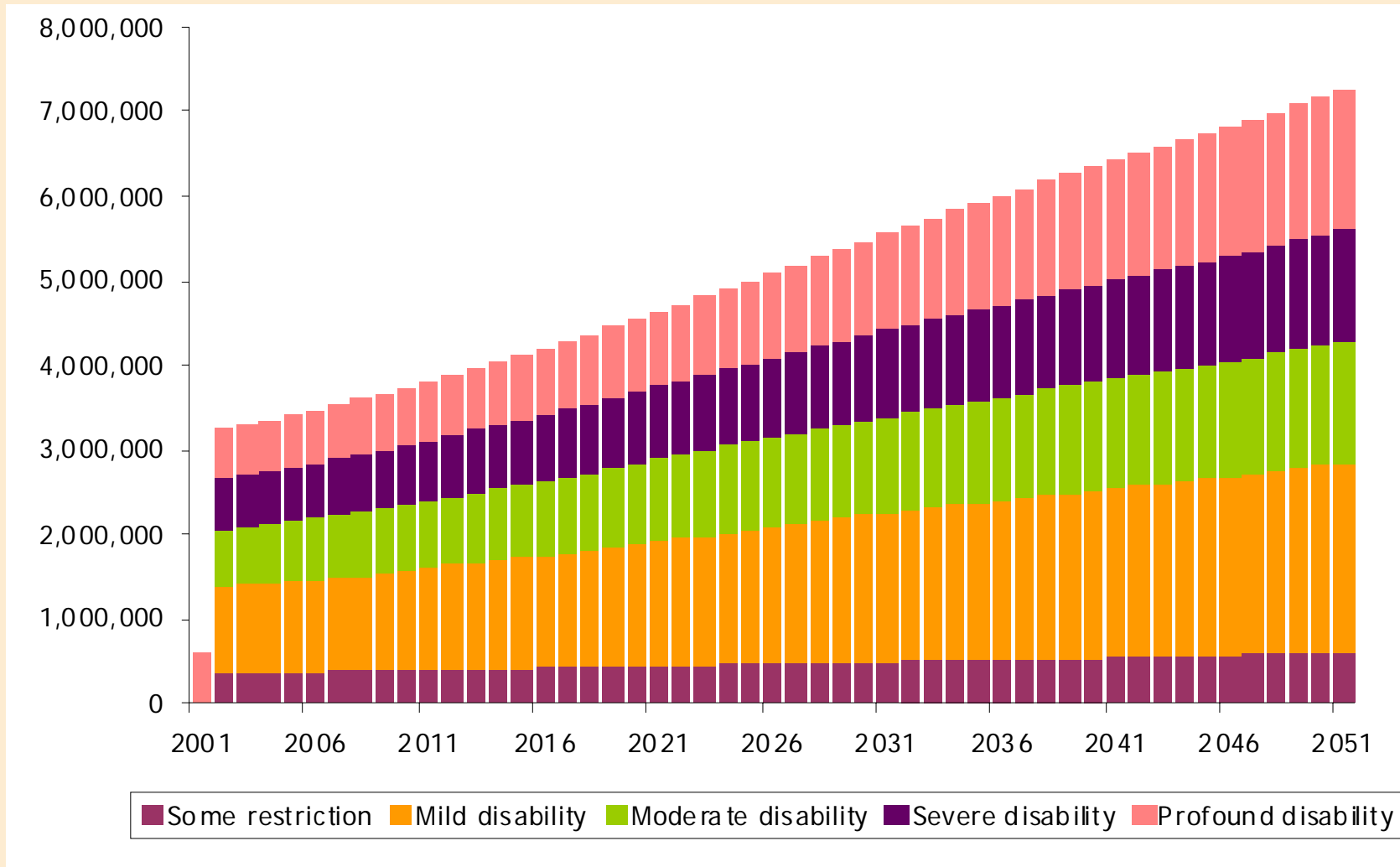
*Green shading denotes initial module construction completed or well underway*



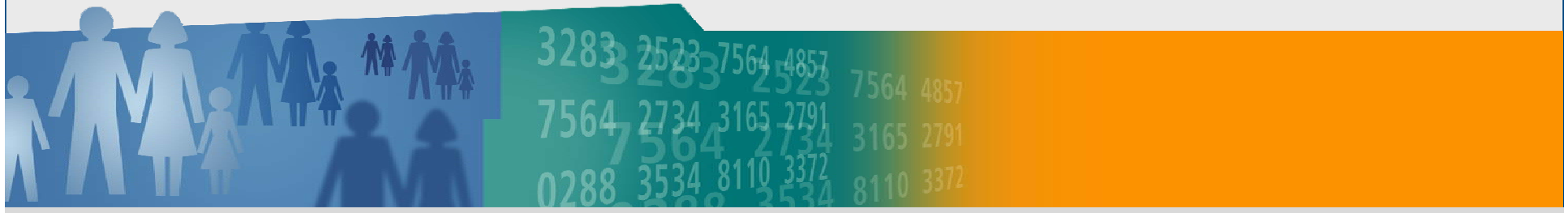
# Parameter Screen



# APPSIM Sample Output – Disability Status



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

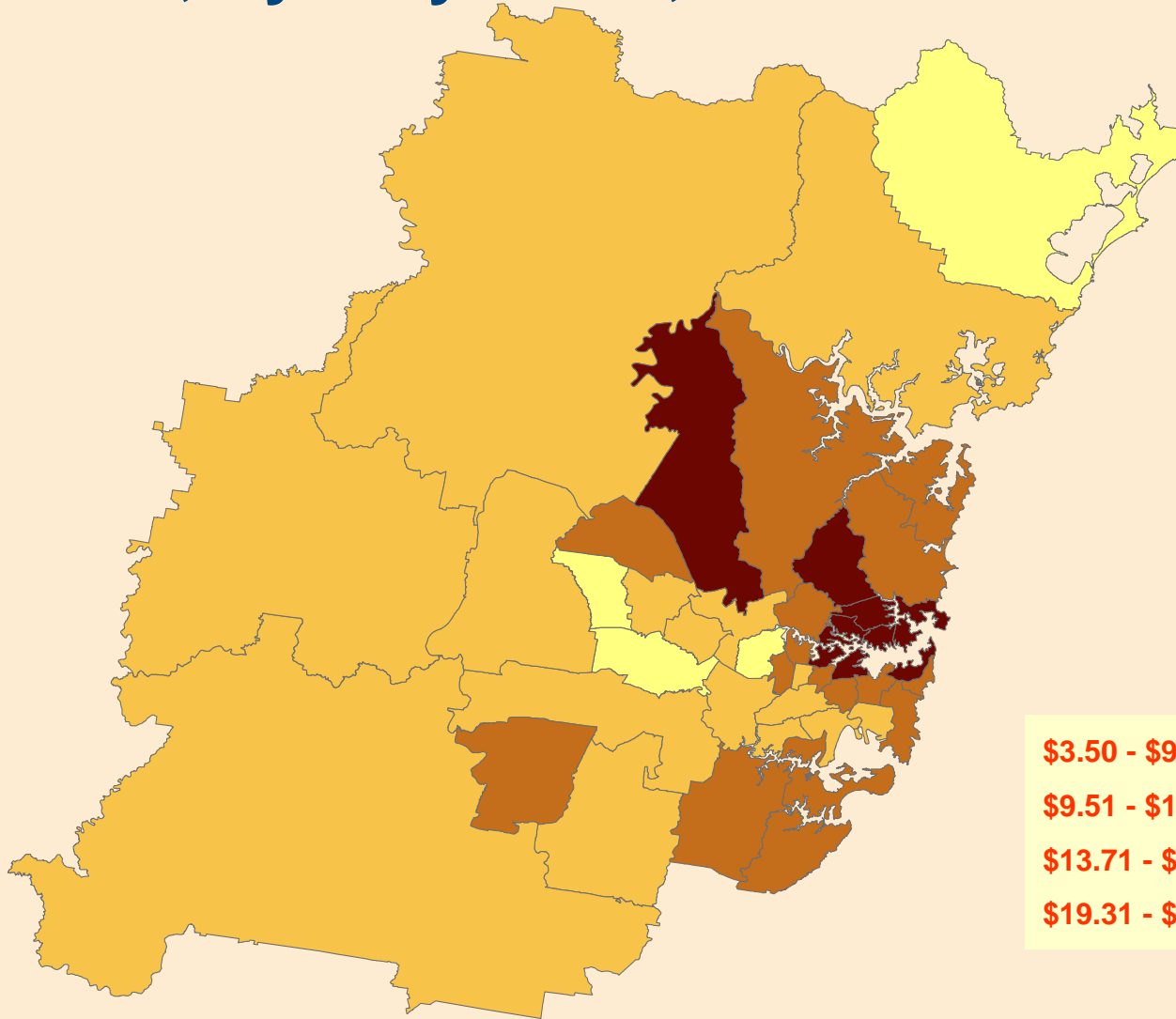
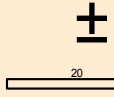
- **Spatial microdata now linked with NATSEM's existing microsimulation models to model the immediate distributional/revenue impact of a policy change**
  - link synthetic spatial output to STINMOD and model changes to the tax and transfer system for small geographic areas
  - Currently modelling changes 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?

2004-05		2005-06	
Tax threshold	Tax rate	Tax threshold	Tax rate
\$6,000	0.17	\$6,000	0.15
\$21,600	0.3	\$21,600	0.3
\$58,000	0.42	\$63,000	0.42
\$70,000	0.47	\$95,000	0.47



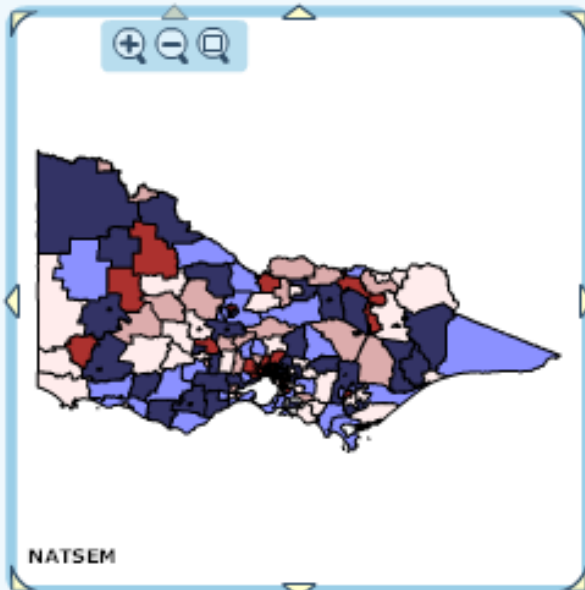
# Estimated average tax cut per household per week, Sydney SLAs, 2005-06



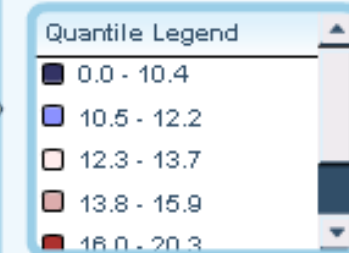
- \$3.50 - \$9.50 pw (lightest)
- \$9.51 - \$13.70
- \$13.71 - \$19.30
- \$19.31 - \$34.10 pw (darkest)

Disability by Sex and Age >> Per cent of Disabled Males out of All Males in the Age Group >> Aged 65 and above

View Table



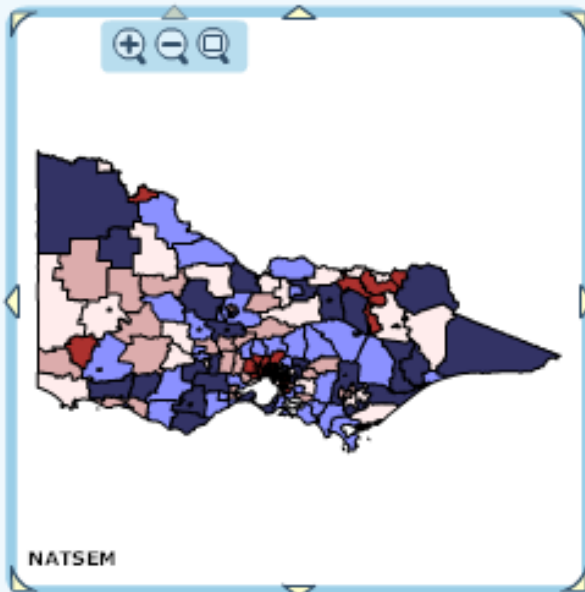
Data  
Legend 1  
Filter



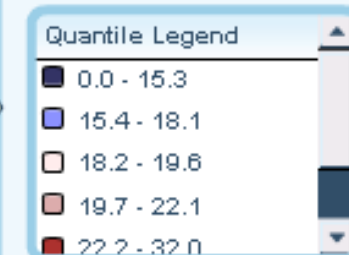
Help Clear Print Print Preview

Name ▲	Map 1	Map 2	
Alpine (S) - East	12.8	18.68	🔍
Alpine (S) - West	17.32	24.54	🔍
Ararat (RC)	13.68	20.91	🔍
Ballarat (C) - Central	17.94	23.47	🔍
Ballarat (C) - Inner North	13.05	15.75	🔍
Ballarat (C) - North	4.62	15.52	🔍
Ballarat (C) - South	15.88	19.25	🔍
Banyule (C) - Heidelberg	15.62	22.39	🔍
Banyule (C) - North	12.54	18.16	🔍
Bass Coast (S) - Phillip Is.	11.02	15.56	🔍
Bass Coast (S) Bal	12.67	15.5	🔍
Bass Strait Islands	No Data	No Data	🔍
Baw Baw (S) - Pt A	12.08	20.65	🔍
Baw Baw (S) - Pt B East	4.6	14.16	🔍

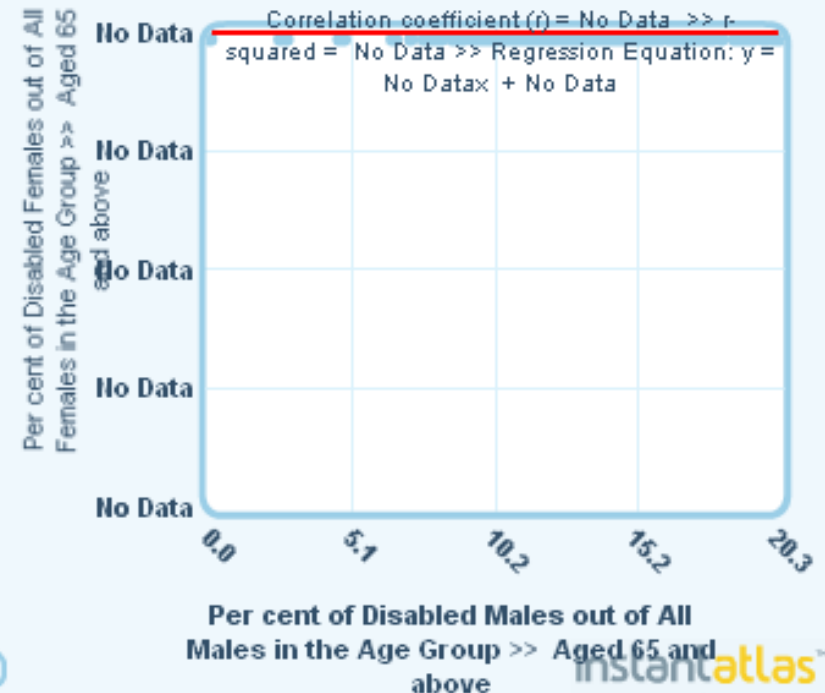
Disability by Sex and Age >> Per cent of Disabled Females out of All Females in the Age Group >> Aged 65 and above



Data  
Legend 2  
Filter



\*Data unreliable and suppressed



Data Source: Census 2006

# 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](http://www.natsem.canberra.edu.au) and join our free email update list
  - 2<sup>nd</sup> General conference of International Microsimulation Association, Ottawa, June 2009  
<http://www.statcan.gc.ca/conferences/ima-aim2009/index-eng.htm>
  - International Microsimulation Association (free to join) - <http://www.microsimulation.org/>

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+ see the papers describing the construction of APPSIM at the Working Paper section of the NATSEM website – [www.natsem.canberra.edu.au](http://www.natsem.canberra.edu.au)

## STINMOD and its use in public policy

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