Retirement Income Design with an Ageing Demographic

John Piggott
Australia’s retirement income framework is as good as it gets

i.e., a means-tested pillar + compulsory pre-funded second pillar + tax preferred voluntary retirement saving

Economic analysis (economics of taxation and experimental economics) provide analytic support

But some policy and research issues are outstanding
Lecture Outline

1. Demographics and pension design
2. First pillar – means testing
3. Second pillar – Mandating retirement saving
4. Implementation issues: Policy and Products
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Demographics – dependency ratio

Old-age dependency (pop aged 65+ as percentage of pop aged 15-64), 1901-2050

Source: ABS Cat 3101.0, ABS Cat 3222.0, ABS Cat 3105.0.65.001, projections from UN (2011) ‘World Population Prospects: The 2010 Revision’; Note: Treasury 2010 projections show dep at 37%
Demographics – life expectancy

Life expectancy at birth (years), 1901-2051

Demographics – life expectancy by age

Percentage point reduction in mortality rate by age, Australia, Females

Source: Human Mortality Database www.mortality.org; ABS Cat 3302.0.55.001; ABS Cat 3105.0.65.001
Demographics - fertility

Total Fertility Rate (children per woman), 1901-2051

Australia, Japan, China

Demographics – Window of opportunity

Working-age as proportion of total population (%), 1950-2050

Peak of Japan’s demographic dividend
Peak of China’s demographic dividend
Peak of Australia’s demographic dividend

UN (2011) 'World Population Prospects: The 2010 Revision
Pension design – When pensions become unaffordable

Decomposition of gross public pension expenditure change over 2010-2060 (p.p. of GDP)


Benefit Ratio  Employment rate  Coverage ratio  Dependency ratio  Change 2010-2060

Latvia  Poland  Estonia  Italy  Denmark  Portugal  France  Sweden  Greece  Bulgaria  Czech R.  UK  EU27  Austria  Germany  Hungary  Finland  Lithuania  Spain  Netherlands  Romania  Ireland  Norway  Slovak R.  Malta  Belgium  Slovenia  Cyprus  Luxemburg
Pension design – options

Safety net for adequacy purposes
- Universal
- Targeted

Compulsory saving for income replacement
- Pay As You Go
  - Pre-funded
    - Public provision
    - Private provision
  - Public provision
    - Private provision

Voluntary saving for income replacement
- Employment related
  - Tax preferred
  - Non tax preferred
- Other
Pension design – What we have

Safety net for adequacy purposes
- Universal
- Targeted
  - Public provision
  - Pay As You Go
    - Private provision
    - Pre-funded
      - Public provision
      - Employment related
        - Private provision
          - Australia’s Age Pension
          - Public provision
          - Pre-funded
            - Public provision
            - Employment related
              - Private provision
                - Australia’s Superannuation Guarantee
                - Tax preferred
                  - Australia’s tax preference for voluntary Super contributions
                  - Non tax preferred
                    - Other
                      - Tax preferred
                      - Non tax preferred
                        - Other
                          - Tax preferred
                          - Non tax preferred
Pension design – How we got here

1900 New South Wales: First means-tested social assistance pension in Australia

1908 Australia-wide means-tested social assistance pension

1938 National insurance and health bill passed but abandoned for WW2

1976 Hancock inquiry recommends earnings related pension

1986 Industrial relations agreement for universal Super

1992 Superannuation Guarantee introduced

2002 Super contribution of 9% fully phased in
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The Australian Age Pension

• Access age: 65, moving to 67
• Non-contributory, tax financed, means tested
• 28% of average f/t male earnings for singles
• 50% full, 25-30% part, 20-25% get nothing
• Costs 2.7% of GDP in 2010; 3.9% in 2050
Issues in means testing

- Public administration costs
- Personal costs
- Political costs
- Economic distortions
Issues in means testing

Effective marginal tax rates—single age pensioner, January 2009
Arguments for means testing: revenue requirements

\[ p(1+t) \]

\[ p(1+2t) \]

\[ t^2 \]
Literature: from optimal tax to means-test

Include capital income in tax at the same rate – comprehensive income tax
(Haig 1921 and Simons 1938)

Don’t tax capital income to avoid distorting S→ I→ GDP→ W
(Judd 1985; Chamley 1986)

Since retirement saving & retirement leisure are complements, means testing may be an efficient tax on capital
(Kumru and Piggott, 2010)

Age-specific taxes are less distorting
(Erosa and Gervais 2002)

In absence of age-specific taxes, OLG modelling shows should tax capital income
(Conesa et al. 2009)
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The Superannuation Guarantee

- Covers almost all employees
- Contribution rate of 9% (moving to 12%)
- Preserved to age 55 -> 60, tax free at 60
- Tax preferred
- No decumulation structure
Why mandate saving?

- To offset saving disincentives of a safety net (Hayek, 1960)
- To offset dynamic preference inconsistency
How to think about preference inconsistency?

When both small and large rewards are further away in time you want the larger reward.

But this reverses when time to small reward is short, and you take small reward.

When both small and large rewards are further away in time you want the larger reward.
Historical Hints

"We are often willing even to pay a price to pre-commit future actions (and to avoid temptation)."
– Strotz (1956)

“Much that a . . public system accomplishes could have been contrived privately. But it wasn’t.

And the voters are at least partially aware of their own imperfections. Models that ignore this miss an important point of the problem. ”
– Samuelson (1987)
Empirical evidence

Experiment example (Thaler, 1981)

...$15 now was found to be on average equivalent to...

...$20 in a month (with implied discount rate of 345%), and...

...$50 in one year (with implied discount rate of 120%), and...

...$100 in 10 years (with implied discount rate of 19%)
Empirical evidence

Imputed discount factor \( = \frac{1}{1 + \text{discount rate}} \)

Imputed discount factor from collection of experiments (Frederick et al. 2002)
From intuition about self-control to its modelling

- Discussion only (Eugen von Böhm-Bawerk, 1889)
- First formalisation of trade-off (Fisher, 1930)
  - Constant discount rate (Samuelson, 1937)
  - Discount rate diminishes with time to reward (Strotz, 1956)
  - Introduce functional form for inconsistent preferences (Phelps and Pollak, 1968)
  - Applying inconsistent preference frameworks to saving (Laibson, 1997)
- Self-control cost and value of commitment (single self framework) (Gul & Pesendorfer, 2001)
- Discussion only (Ray, 1905)
Policy implications in OLG models

Taxation and self control \text{Krusell, Kuruscu and Smith, (2010)}

Means testing and self control \text{Kumru and Piggott (in progress)}

Social Security provides commitment device reduces regret \text{Imrohoroglu et al. (2003)}

Social security or mandatory prefunding is valued because reduces temptation options \text{Kumru and Thanopoulous (2012)}
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Decumulation

Superannuation pension benefits (% share)

- Proportion taken as a pension
- Proportion taken as a lump sum

Annuities purchased ($ million, current)

- ST annuities
- LT annuities
- Life annuities

Policy

- Australia the only OECD country with an established mandatory pre-funded structure without an effective decumulation structure
- Need support for longevity insurance + coordination of agencies
Products

- Standard annuity family (Yaari 1965)
- Deferred Annuities (Milevsky 2005)
- Ruin contingent life annuities (Milevsky et al 2009)
- Pooled annuity funds (Piggott et al 2005)
- Milevsky et al 2009
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But some policy and research issues are outstanding – we have a bridge only partly built.
Email  j.piggott@unsw.edu.au
Web     www.cepar.edu.au
Twitter @cepar_research

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