The Actuarial Profession
making financial sense of the future

The Mis-selling of Investment Risk in Mandatory Pension Savings

Shane Whelan
University College Dublin

Outline

- Background/context
  - A system to last 100 years and more
  - Unusual internationally
- Ireland's current system
  - A snapshot of how it delivers to aged
  - Outlook for current system
- Summarise current proposals for change in Ireland and UK
- Make explicit some implicit assumptions in both Irish and UK proposals
  - Reliance on equity risk premium in top-up arrangements
    - "Board members, apart from the representative of the Minister for Finance, believe that the proposal for State retirement support [investment guarantees] should be pursued vigorously, because of the potential benefits to supplementary pension provision." p.99, (para 9.7), Pensions Board (2005).
    - "But the shift of investment risk to individuals of modest income is of significant concern." p.104, [UK] Pensions Commission First Report (2004).
- Consider the embedded principles behind current proposals
  - The market replacing the State; financial contract replacing social contracts
  - Are we maintaining a system that works on average but not individually?
- Argument: Why not simply upgrade current flat-rate scheme?

UCD DUBLIN

The Actuarial Profession
making financial sense of the future

Ireland's Current System

- Pensions policy has two distinct aims
  - to relieve poverty in aged.
  - to smooth income over adult lifetime.
- For each aim there is a distinct structure
  - State pension – basically a flat rate pension to relieve poverty.
  - Occupational/private pensions – to give a degree of income smoothing over lifetime.
- Each has distinct method of financing
  - State pension – pay-as-you-go (social contract).
    - Allows improvements immediately.
    - Risk is demographic change/breakdown of social cohesion.
  - Occupational/private pensions – pre-funding with taxation incentives (financial contract).
    - Improvements need to be financed over decades.
    - Large investment risk, and methods to reduce or transfer it now unpopular – defined benefit scheme, with profits policies.

UCD DUBLIN

The Actuarial Profession
making financial sense of the future

Background

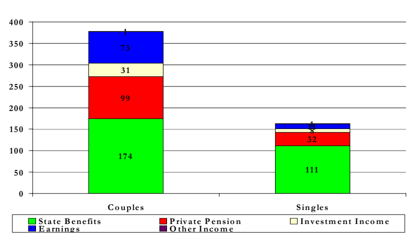
- Rationale behind the largely flat-rate system in UK, Ireland, New Zealand, and Canada
  - *Enumeration and Classification of Paupers, and State Pensions for the Aged.* Charles Booth, Journal of the Royal Statistical Society in 1891.
  - Beveridge (1942) developed and broadened idea into a wider social contract
    - The State to offer financial security to citizen in return for services and contributions from the citizen – in particular the contributory state pension at a level adequate for society, maybe not individual.
- Supplemental, generally salary-related pensions, granted to public servants and privately incentivised through tax system.
- In contrast to compulsory more earnings-related scheme in almost all other developed nations, following the example of Germany in 1889.
  - State pensions (outside of public servants) in UK and Ireland amongst the least generous in the developed world, even lower than US Social Security.

Uniquely Irish Background

- Pensions only part of the welfare of the elderly
  - health care
  - Society's attitude to elderly (crime, etc)
- Pension policy has wide ranging influences in economy
  - Slowing the process of urbanisation in Ireland over the last century
- State pensions are important issue to electorate
  - Disquiet when reduced
  - Ireland 1924; France 1995; Italy 1998
- Even suggested as a weapon in the Civil War!
  - See Ó Gráda, C. (2002),'*The Greatest Blessing of All': The Old Age Pension in Ireland*. Past & Present, (Oxford) 175, 124-161.

On average all appears fine…

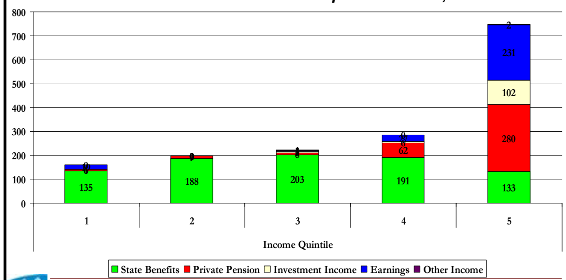
Breakdown of Income of Retired Couples in Ireland, Year 2000



Source: Hughes & Watson (2005)

But only on average…distribution uneven

Breakdown of Income of Retired Couples in Ireland, Year 2000

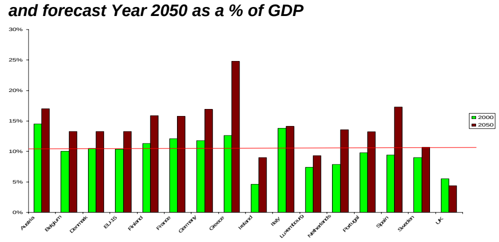


Source: Hughes & Watson (2005)

The Actuarial Profession
making financial sense of the future

Outlook for State Pension – Affordability of Poverty Relief

Expenditure on Public Pension System in Europe, Year 2000 and forecast Year 2050 as a % of GDP

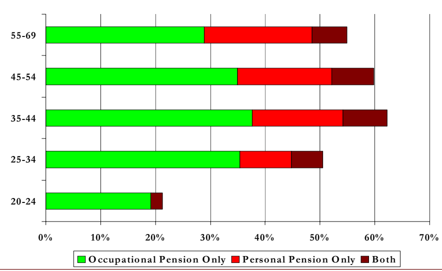


Economic Policy Committee (2001), see Table 3.1 (p. 61) in Pensions Commission (2004)

The Actuarial Profession
making financial sense of the future

Outlook for Current System – Income Smoothing

Occupational/Private Pension Coverage in Ireland, by Age and Type

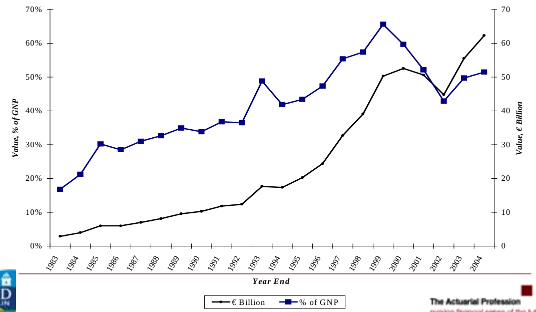


The Actuarial Profession
making financial sense of the future

Source: CSO(2004)

Outlook for Current System – Income Smoothing

Growth in the Value of Assets of Irish Pension Funds, 1983-2004



Source: From IAPF Surveys

Outlook for Current System – Income Smoothing

- Higher pensions from private/occupational schemes in short-term (next decades)
  - Higher benefits and higher security
  - But not significantly greater coverage
- But what is longer term outlook for private/occupational pensions?

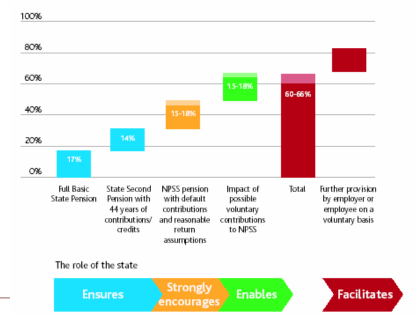
The Actuarial Profession
making financial sense of the future

Outlook for Additional Pensions – Income Smoothing

- Grim
  - DB Scheme, outside of public sector is dead
  - Partially replaced by DC schemes, but with lower contributions
  - [Part of broader trend of investment risk being transferred to individual]
- No simple remedy
  - PRSAs from 2003, disappointing take-up
    - (although the very optimistic might contend it is too early to judge)
  - Pensions Board recommends many micro measures to improve incentives and improve accessibility but all based around individual retirement accounts.
    - Mandatory not recommended, but if this pursued then favour increase in State pension plus mandatory special savings accounts
- Pensions Commission (UK)
  - Attempting something similar but with auto-enrolment
  - But with more complicated State system, crucially with means-testings, so eventual State pension opaque.
  - Will it succeed in UK when failing in Ireland?

The Actuarial Profession
making financial sense of the future

UK Pension Commission Proposal: Potential pension income as % of earnings for median earner at point of retirement in 2053



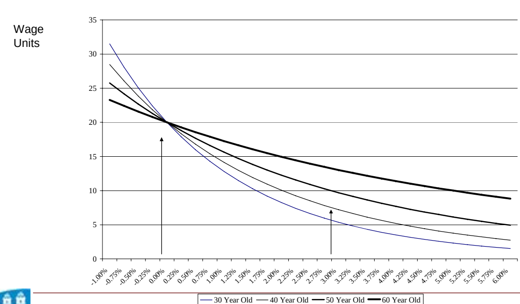
Source: Hills, J. (2007) ***Demographic trends and the future of pensions in the UK*** . Presented to the Statistical & Social Inquiry Society of Ireland, 19th April.

"It is often supposed that the costs of production are threefold, corresponding to the rewards of labour, enterprise, and accumulation. But there is a fourth cost, namely risk; and the reward of risk-bearing is one of the heaviest, and perhaps the most avoidable, burden on production."

J.M. Keynes, Preface to *A Tract on Monetary Reform (1923)*

Present Value of Pension of one unit of wages, from age 65 to age 85

(as function of assumed investment return above wage escalation)



investment return above wage escalation

The Sums for a 40 Year Old

[Pension of one unit of wages, from age 65 to age 85]

	Wage Units
Present Value of Pension, @return 3% above wage escalation:	7.2
Present Value of Pension, @return 0% above wage escalation:	20.0

Real Returns, Expenses and Wage Escalation in Accumulation Phase

[Based on assumptions in National Pensions Review (2005)]

Investment Strategy	Real Return	Investing Expenses	Real Salary Increase	Return above Salary Escalation	Admin. Expenses	Net Return above Salary Escalation
	% p.a.	% p.a.	% p.a.	% p.a.	% p.a.	% p.a.
100% Equities	6.00	0.65	2.0	3.35	1.5	+1.85
100% Government Bonds	1.75	0.10	2.0	-0.35	1.5	-1.85
100% Index-linked Bonds	1.75	0.10	2.0	-0.35	1.5	-1.85
75% Equities, 25% Bonds	4.94	0.51	2.0	2.43	1.5	+0.93
50% Equities, 50% Bonds	3.88	0.38	2.0	1.50	1.5	0.00
100% Equities up to 10 Years to Retirement then 100% Bonds	4.50	0.42	2.0	2.08	1.5	+0.58

Assumptions above similar to financial assumptions in [UK] Pensions Commissions First Report Appendix C (p.80), except for administration expenses with [UK] Pensions Commission estimating at 0.3-0.8%.

The Sums for a 40 Year Old

[Pension of one unit of wages, from age 65 to age 85]

	Wage Units
Present Value of Pension, @return 3% above wage escalation:	7.2
Present Value of Pension, @return 0% above wage escalation:	20.0

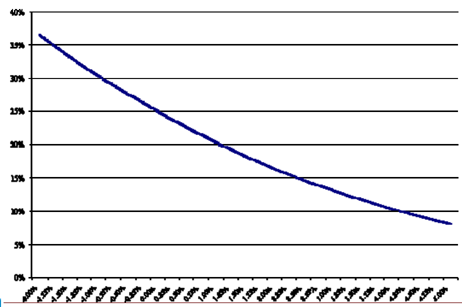
The Sums for a 40 Year Old

[Pension of one unit of wages, from age 65 to age 85]

	Wage Units
Present Value of Pension – Equity Investment, @return 3% above wage escalation:	7.2
Present Value of Pension – Bond Investment, @return 0% above wage escalation:	20.0
Present Value/Measure of Equity Risk (over Bond):	12.8

Contribution Rate as % of Salary for a Pension of Half Salary

[under various assumed rates of return above wage escalation in accumulation phase]



Simplistic assumptions: Saving period 40 years, drawdown period 20 years, O% rate of return above wage escalation in drawdown period.

Real Returns, Expenses and Wage Escalation in Accumulation Phase

[Based on assumptions in National Pensions Review (2005)]

Investment Strategy	Real Return	Investing Expenses	Real Salary Increase	Return above Salary Escalation	Admin. Expenses	Net Return above Salary Escalation
	% p.a.	% p.a.	% p.a.	% p.a.	% p.a.	% p.a.
100% Equities	6.00	0.65	2.0	3.35	1.5	+1.85
100% Government Bonds	1.75	0.10	2.0	-0.35	1.5	-1.85
100% Index-linked Bonds	1.75	0.10	2.0	-0.35	1.5	-1.85
75% Equities, 25% Bonds	4.94	0.51	2.0	2.43	1.5	+0.93
50% Equities, 50% Bonds	3.88	0.38	2.0	1.50	1.5	0.00
100% Equities up to 10 Years to Retirement then 100% Bonds	4.50	0.42	2.0	2.08	1.5	+0.58

Assumptions above similar to financial assumptions in [UK] Pensions Commissions First Report Appendix C (p.80), except for administration expenses with [UK] Pensions Commission estimating at 0.3-0.8%.

Contribution Rate as % of Salary for a Pension of Half Salary

[under various assumed rates of return above wage escalation in accumulation phase]

Simplistic assumptions: Saving period 40 years, drawdown period 20 years, O% rate of return above wage escalation in drawdown period.

Contribution Rate as % of Salary for a Pension of Half Salary

[under various assumed rates of return above wage escalation in accumulation phase]

Simplistic assumptions: Saving period 40 years, drawdown period 20 years, O% rate of return above wage escalation in drawdown period.

Perverse Conclusion

- Perverse conclusion: the more investment risk taken the less one needs to save.
  - Ignores investment risk and its consequences
  - Ignores its market price (transfer of risk from those that know its price to those that do not)
- Leads to many inconsistencies
  - In particular that the State can achieve a real return of 4.6% p.a. and borrow (issue bonds) with a 1.75% p.a. real return! So what pension crisis?
  - If risk premium assumed then its consequences must be modelled
  - “the unpredictability of the financial markets could produce ambiguous and unmanageable retirement ages, which could lead to personal hardship and anxiety for the individual…” MacDonald & Cairns (2007)

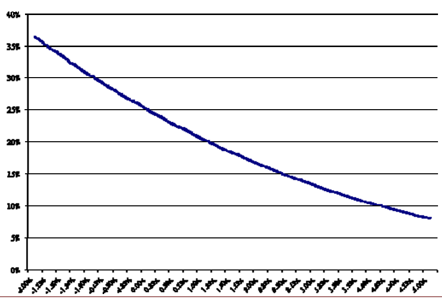
Pertinent Conclusion

- <u>Pertinent conclusion</u>: the more investment risk taken the more one must save for a certain *minimum* pension
- Pension savers – especially on low pensions - cannot afford to take investment risk
  - Nor is it in the interests of the State
- Least risk investment strategy is to invest 100% in index-linked bonds of suitable duration, with real return of about 1.75%-2% currently
  - [If there was a market in them!]
  - This would give a return of about 0% above wage escalation, before administration costs

The Actuarial Profession
making financial sense of the future

Contribution Rate as % of Salary for a Pension of Half Salary

[under various assumed rates of return above wage escalation in accumulation phase]



Simplistic assumptions: Saving period 40 years, drawdown period 20 years, O% rate of return above wage escalation in drawdown period.

The Actuarial Profession
making financial sense of the future

But…

- A market in index-linked stock = state committing future taxation revenues to meet its financial obligations.
- PAYG system = state committing future taxation revenues to meet its social obligations.

The Actuarial Profession
making financial sense of the future

Two Identical Systems?

- Two almost identical systems on a look-through basis
  - defined contribution arrangements investing in index-linked stock
  - PAYG system
- The key differences between the two systems…
  - Gross Internal Rate of Return (Value-for-Money)
  - Administration costs
- [Second order affects favour sustainable PAYG]

Sustainable PAYG

- Assume stationary population of workers/pensioners
- Contributions % of wages
- Internal Rate of Return (prior to administration charges) is 0% above wage increases!
- Equal to the market return on least risk investments!

$$\bar{a}^{@\,i\%}_{x:\overline{r-x|}} = \frac{\bar{a}^{@\,0\%}_{x:\overline{r-x|}}}{\frac{l_r}{l_x}\bar{a}^{@\,0\%}_{r}}\left(\frac{l_r}{l_x} v^{r-x}_{@\,i\%}\,\bar{a}^{@\,i\%}_{r}\right)$$

$$\frac{\bar{a}^{@\,i\%}_{x:\overline{r-x|}}}{\bar{a}^{@\,0\%}_{x:\overline{r-x|}}} = \frac{\bar{a}^{@\,i\%}_{r}}{\bar{a}^{@\,0\%}_{r}} v^{r-x}_{@\,i\%}$$

- Standard actuarial notation, where *r* is the retirement age and *x* the age when contributions start.
- Clearly, *i=0%* is a solution.
- This solution can be seen to be unique for reasonable *r* by considering the derivative with respect to *i* of both sides.

Sustainable PAYG

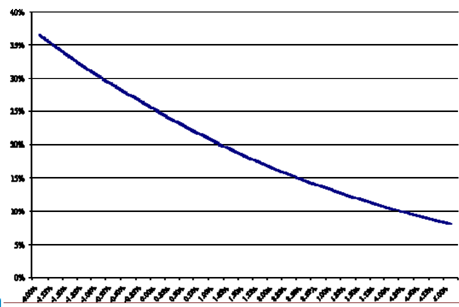
- Turn our current system into sustainable system
  - State saving excess contributions now
  - To drawdown when demographics change
- Needs to commit to financial management programme
  - Formalise social contract
  - National Pension Scheme, with defined benefits

Administration Costs

- Data limited
- Large schemes administration costs at 0.3% p.a. of assets (Mahon (2005), [UK] Pensions Commission (2005))
- Individual accounts administration costs 1.3%-1.5% p.a. of assets [Pensions Board (2005)]
- So a 1% difference.

Contribution Rate as % of Salary for a Pension of Half Salary

[under various assumed rates of return above wage escalation in accumulation phase]



Simplistic assumptions: Saving period 40 years, drawdown period 20 years, O% rate of return above wage escalation in drawdown period.

Order of Magnitude

- A 1% reduction in yield over accumulation phase = a reduction of 20% in the pension (for the same level of contributions)
- A ½% reduction in yield over accumulation phase = a reduction of 10% in the pension (for the same level of contributions)

Conclusion

- Better value for money is given by sustainable PAYG system
- Pensions of the order 10-20% higher for same level of contributions
- Close to current system
- But current social contract must be better defined on lines of financial contract
- BUT
- all this is obscured by the mis-pricing of investment risk.

The Actuarial Profession
making financial sense of the future

The Actuarial Profession
making financial sense of the future

The Mis-selling of Investment Risk in Mandatory Pension Savings

Shane Whelan
University College Dublin