The Actuarial Profession
making financial sense of the future

Pensions, benefits and social security colloquium 2011
Charles Cowling

Discount Rates

25-27 September 2011

Agenda

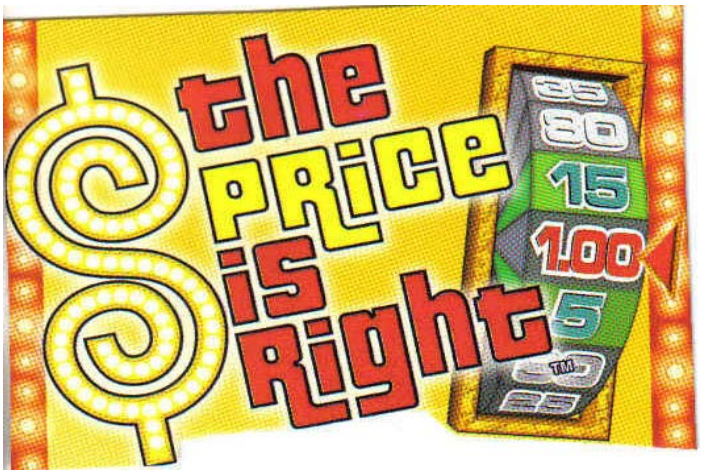
- Background
- UK Actuarial Profession objectives
- UK research project
- Proposed framework and consultation process
- Final recommendations

Background

Discount rates are …

- At the heart of actuarial models
- Fundamental to all that we do
- Affect every discipline and practice area
- A matter of significant public interest

Pricing

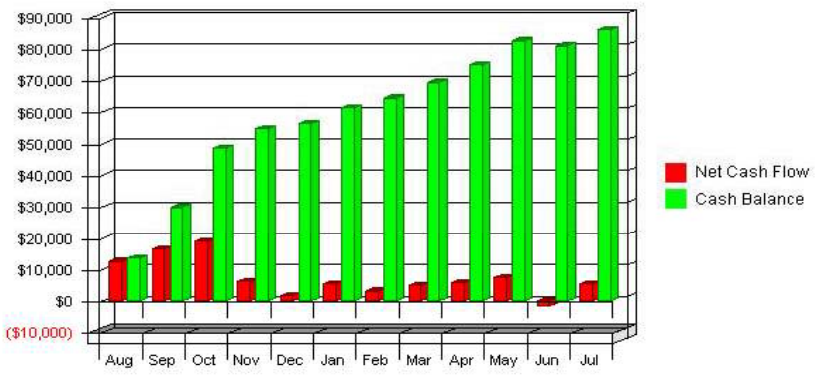


Transactions

Reserving

Funding

Long term planning / financing



Accounting

Big questions for the UK Actuarial Profession

Is it appropriate for the Actuarial Profession to have different actuaries in different practice areas producing very different answers to very similar questions?

Is it possible to create a common language and transparent framework for describing and determining discount rates and possibly reduce the diversity of current practice?

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UK Actuarial Profession objectives

- Establish cross-practice team
- Analyse current practice on discount rates
- Describe how and why risk is included in discount rates
- Develop a common language and framework to describe current practice
- Consider options for reducing diversity of practice and introduce a transparent framework
- Consider impact and management of change

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Discount Rate Steering Committee

Charles Cowling, Chairman	(Pensions)
Robert Hails	(Management Board)
Andrew Smith	
Ralph Frankland	(Life assurance)
James Orr	(General insurance)
Malcolm Kemp	(Investment and ERM)
Ruth Loseby	(Research Manager)
Maria Lyons	(Research Assistant)

Key milestones

March 2010	Discount Rate Forum meeting with key stakeholders
May 2010	Publication of *"Actuaries and Discount Rates"* from Chris Daykin and Chinu Patel
January 2011	Publication of "*Developing a framework for the use of discount rates in actuarial work*"
September 2011	Publication of final recommendations from the UK Actuarial Profession

Current Practice and Existing Research (Daykin and Patel (2010))

- Reviewed last 400 years and current practice
  - Two broad families of calculations (for discounting liabilities)
  - Matching – price/value of assets that (as far as possible) seek to match characteristics of the liability cash flows
  - Budgeting – price/value of assets used to fund liabilities as they fall due
- Selection appears to be mainly driven by purpose and context
- Important to communicate embedded risk encapsulated within discount rate

Wide range of discount rates are / have been used in practice

- Prudent vs. realistic vs. smoothed
  - What is the purpose of the valuation?
  - Discount rates not the only elements in valuations
- Some not directly related to asset markets, e.g. Social Time Preference Rate
  - Based on comparisons of utility through time
- Utility considerations introduce debate on price vs. value
- Consistent valuation of asset and liability cash flows
- Classify between matching and budgeting – is choice binary?

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Proposed framework

Discount rates developed within two alternative approaches

- "Matching" (i.e. "Market Consistent") using discount rates consistent with current market value of assets that replicate the future economic behaviour of the liabilities
- "Budgeting" using discount rates consistent with the expected future returns on the assets held to provide for the cash flows as they fall due

Practical constraints limit extent of pure "matching"

- But, market consistency principle is well established
- Deviations from perfect matching have consequences for risk and solvency of financial firm or organisation

Applications of the Two Approaches

"Matching"

- Transactions, avoiding arbitrage
- Adequacy of assets, knowing that these can secure assets in market if perfect matching can be achieved

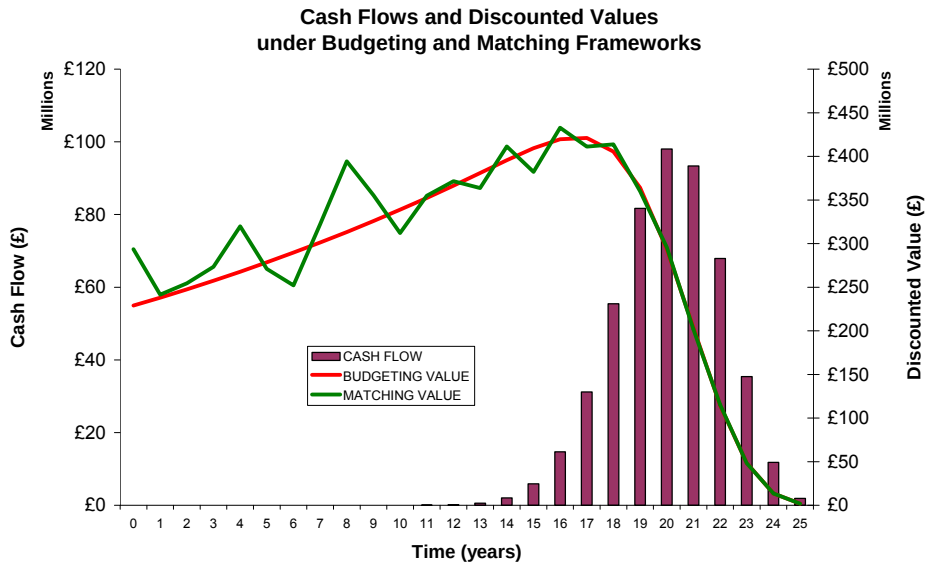
"Budgeting"

- Planning, based on assumed rates of return
- Funding, where market transactions or market comparisons are neither required nor anticipated

Cash Flow Example – Framework Comparison

- Hypothetical cash flow stream
  - mean term ~20 years
  - smooth build-up from 12 years and diminution to 25 years
- Valuing under two frameworks
  - budgeting using long-term (risk-free) average of 4%
  - matching reflects consistent but variable yield-curve
- Gap between two discounted values varies over time
  - Budgeting Value ≡ funding required under long-term assumptions
  - Matching Value ≡ "buy-out" cost

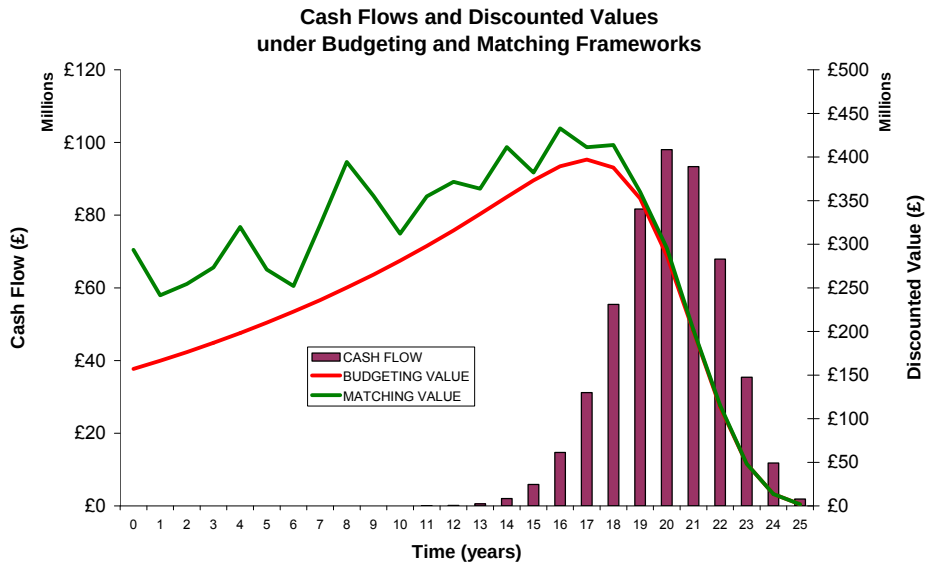
Cash Flow Example - Framework Comparison



Cash Flow Example – "Equity Premium"

- Same hypothetical cash flow stream
- Still valuing under two frameworks
  - budgeting using expected average equity return of 6%
  - matching reflects consistent but variable yield-curve
- Gap between two discounted values varies over time
  - Budgeting Value ≡ funding required under long-term assumptions
  - Matching Value ≡ "buy-out" cost
- Investing in equities will create further risk

Cash Flow Example – "Equity Premium"



Matching calculations (1) Rationale

- If asset and liability cash flows exactly match then would expect them to be given the same value
- Law of One Price / Principle of No Arbitrage / Law of Contemporaneous Value Continuity
  - Nearly identical cash flows should have nearly identical values

$$V\left(k\left(A+B\right)\right)=kV\left(A\right)+kV\left(B\right)$$

- If we decline to hold the matching asset portfolio, because there is one we think has a higher expected return
  - Does / should this reduce the value of the liabilities?

Matching calculations (2) Accounting Arbitrage

- Defined in paper as “a rearrangement of financial affairs to give a different accounting treatment when little of economic substance has changed
- Various “conjuring tricks” open up if we are allowed to use (inconsistent) off market values for assets (or liabilities)
  - Hedges that appear to be effective balance sheet hedges may be poor hedges of underlying economic position
- Even when assets and liabilities are (deliberately) mismatched, decomposing problem into matching portfolio and remainder may help with shareholder value and performance measurement

Matching calculations (3) Building blocks

- Include (see Section 3.2.1 and Appendix A)
  - Selection of instruments used to construct discount curves
  - Default risk, premiums for liquidity
  - Allowance for taxation and other expenses
  - More subjective than sometimes thought
- N.B.

  (a) Discount rates are not the only elements of liability cash flows that may be 'matched'

  (b) Often need clarity over what is 'risk-free'

Budgeting calculations (1) Rationale

- Measurement of liability approached from viewpoint of how the liability is going to be financed
  - Discount rates set by reference to expected returns from pre-determined investment strategy
- Usually greater embedded risk, and therefore greater level of uncertainty attaching to a plan achieving its objectives
  - Less precise, so may be expressed as a single rate rather than a curve
- Main current use: DB pension scheme funding 'valuations'
  - Also shareholder / enterprise appraisal

Budgeting calculations (2) Building blocks

- E.g. A common current DB funding 'valuation' approach
  - Trustees and sponsor agree investment strategy
  - With an expected (long-term) outperformance (e.g. from adopting an equity bias)
  - Higher but more volatile investment returns will lead to lower long term contribution costs. In meantime, scheme health underpinned by sponsor covenant
- Usually, discount rates include an element of prudence vs. statistically 'expected' return (sizes of which may vary, e.g. because of strength of sponsor covenant)

Matching vs Budgeting

Purpose	Guaranteed	Constructive	Discretionary
Solvency	Matching	- [1]	- [1]
Transaction	Matching	Matching	Matching
Funding [2]	Budgeting	Budgeting	Budgeting

Notes:
1. *A matching framework may be appropriate for projections of future solvency*
2. *It may be necessary to introduce matching framework constraints in budgeting calculations. The need for such constraints will be greater if the liabilities / cash flows are predominantly guaranteed rather than constructive or discretionary.*

A plea for transparency

- Main difference between matching and budgeting is extent to which advance credit is being taken of a favourable outcome from an investment view which might or might not come good
  - Magnitude of view; and
  - How much of it is being credited for in advance (i.e. level of prudence)
  - Two approaches should produce essentially same answer if 'expected' relates to matching / replicating portfolio
- How do any differences affect different interested parties?
- And is this clear to them?

Addition to Actuarial Reports

Matching Framework Adequacy

– Does not imply Matching Framework Adequacy is satisfied throughout unless close matching is employed

Budgeting Framework Adequacy

– Implies nothing about Matching Framework adequacy in the future

Budgeting Framework or Volatile Matching Framework Result

– An indication of the impact of the variability should be given

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Final Recommendations

1. Encourage and equip actuaries *(through education and CPD)* to determine discount rates (and be able to justify their choice of discount rate) within a matching framework and / or budgeting framework.
2. Where relevant to the context of the actuarial advice being given, actuaries should be encouraged *(through education and CPD)* to highlight in their work any material difference between the values placed on contractual asset or liability cash flows and their corresponding market or market consistent values, and explain the main contributors to this difference.
3. Encourage and equip actuaries *(through education and CPD)* when presenting advice involving the use of discount rates to communicate clearly the framework, building blocks and level of embedded risk they have used in assessing the discount rate(s).

Final Recommendations

4. Encourage and equip actuaries *(through education and CPD)* to highlight to their clients the limitations of a budgeting calculation in the assessment of Technical Provisions under UK pensions regulations which in isolation does not provide adequate information on the assessment of the certainty of delivery of members' benefits. A more complete view needs assessment of the reliance on the scheme sponsor's covenant.
5. Encourage and equip actuaries *(through education and CPD)* in assessing what is a "prudent" discount rate for the purposes of calculating Technical Provisions under UK pensions regulations, to give primary consideration to the current or evolving pension scheme investment strategy. However, in support of the BAS requirement to explain the limitations of any models, actuaries to be encouraged *(again through education and CPD)* to help their clients understand what is "prudent" in the assessment of Technical Provisions by considering the extent to which the sponsor covenant is able to support the difference between a solvency assessment of the liabilities and the proposed level of Technical Provisions.

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Final Recommendations

6. Equip actuaries *(through education and CPD)* to use a budgeting framework for advising on recovery plans for restoring pension scheme funding up to the level of Technical Provisions (as calculated under UK regulations). Further, encourage and equip actuaries *(through education and CPD)* to highlight the limitations of this approach in isolation for providing adequate information on the assessment of the security of members' benefits during and at the end of the recovery period.
7. Where such a comparison is required or appropriate, to encourage and equip actuaries *(through education and CPD)* to calculate estimates of pension scheme solvency using a matching framework making no adjustment for sponsor default on the pension obligation.
8. Encourage and equip actuaries *(through education and CPD)* where it is appropriate to have a wider aspect covered by their advice - to encourage, through their advice, more understanding on the likelihood of benefit delivery in the communication of funding information to members and trustees.

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Final Recommendations

9. The Actuarial Profession should support the use of a matching framework for reserving for long term financial liabilities in company accounts.
10. Encourage and equip actuaries *(through education and CPD)* in giving advice on member / policyholder options / transactions (including cash equivalent transfer values and surrender values) to help users understand the implications of their advice within a matching framework *(this may need to be through supplementary information when legislation or other considerations dictate adoption of an alternative approach in practice).*
11. The Actuarial Profession should support the apparent move to a matching framework for liability valuation under Solvency II and encourages the UK regulator to preserve this principle in implementing the measures.

Final Recommendations

12. Encourage actuaries *(through education and CPD)* to promote understanding of insurance policy / product pricing in a matching framework.
13. Encourage actuaries *(through education and CPD)* that, where the benefits payable under an insurance policy are linked to the performance of a defined pool of assets, projections of benefits payable should be based on a budgeting framework.

Questions or comments?

The views expressed in this presentation are those of the presenter.

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