

A framework for the use of discount rates in actuarial work

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The UK Actuarial Profession has recently undertaken a thought leadership cross-practice research project on the use of discount rates by UK actuaries. The goal of the project is to help actuaries speak clearly and with authority in future debates about discount rates and to support actuaries in communicating impartially and effectively. The project has proved a powerful way of engaging with constituencies important to actuaries. It has created a range of well-regarded outputs, including a paper by Cowling et al. (2011), presented at Sessional research meetings in London and Edinburgh in January 2011 and an earlier paper by Daykin and Patel (2010) presented to a forum of thought leaders from across the Actuarial Profession and externally in March 2010. It has helped frame responses by the Actuarial Profession in areas of public interest such as public sector pensions. In short, it is a good example of the sort of thought leadership that the Profession is keen to undertake more of, as part of the revamped strategy that the Profession's Council adopted in 2011.

Discount rates are fundamental to virtually all branches of actuarial practice and to much else besides. Discount rates, yield curves, projections that take account of the power of compound interest and the like are fundamental tools across the whole of the financial community and beyond. Indeed, to the extent that discounting can be viewed as a way of equating values placed on present versus future consumption, discount rates can be viewed as fundamental to the entire economic system and hence to everyone!

What became obvious as this project progressed was that use of discount rates in actuarial work (and outside the actuarial profession) has developed in many different ways, not all of which appear immediately consistent with each other. In particular, different practice areas of the Profession have had to face very different regulatory and other constraints. Consequently, it is possible that two actuaries working in different areas may come up with very different answers to essentially a similar question: "*what is the appropriate discount rate to apply to a particular series of cash flows*"?

The focus of the project has therefore been to seek to create a common framework and language for expressing discount rates that will:

- Help actuaries in their day-to-day work when choosing appropriate discount rates
- Help improve consistency in the use of discount rates to the extent that this is applicable
- Help in the effective communication of differences when these are relevant
- Help disentangle elements in the selection of discount rates that may have been set by regulators or politicians that may otherwise become confused with an actuary's professional advice on appropriate discount rates.

Much of the output of the project has concentrated on identifying broad classes of approaches to setting discount rates, identifying when each one might be most relevant, providing a framework that allows for the different risks embedded within different sorts of discount rates and highlighting the elements of subjectivity that may be involved.

Two clear classes of discount rates were identified, namely 'matching' and 'budgeting' calculations. Some approaches to setting discount rates did not fit neatly into either category, such as the 'social time preference rate' used by the Government, but most discount rates used in practice by actuaries seem able to be classified into one or other of these two overarching categories. Most of the time actuaries are involved in valuing liabilities, so most of the project focused on the liability side of the balance sheet and on related topics.

Matching calculations are most relevant to situations where the liability is valued by reference to market instruments (or models that simulate market instruments) which seek to match the characteristics of the liability cash flows. The most obvious uses are where a transaction or transfer of value between parties is involved, or where there is an implicit focus on such a transfer as is generally the case with solvency assessment. Such calculations are relevant even if the institution in question declines to hold matching assets. If the liability is transferred to a third party then its future cash flows and hence its value (to the third party) are largely or wholly independent of how the transferring party might have chosen to manage the risks prior to transfer.

In contrast, budgeting calculations focus on situations where measurement of the liability is approached from the viewpoint of how the liability is going to be financed, with the discount rate being based on the expected returns from a pre-determined investment strategy. These calculations may be useful in planning and budgeting work. The resulting discount rates usually retain a much larger element of embedded risk, perhaps incorporating credit for an equity risk premium if the funding investment strategy includes a substantial equity element. A key point to note is that the increased embedded risk typically present in budgeting calculations puts a much greater onus on actuaries to communicate the risks of adverse consequences. Thus, use of budgeting calculations may be less helpful for solvency purposes, particularly when applied to pre-existing contractual 'rights', and should ideally then be amplified by calculations that have a greater focus on matching. The expected returns projected from the pre-determined investment strategy may not actually materialise.

Having such a framework provides a platform for asking questions such as who are we advising (and for what purpose) and what are the implications. To take an extreme example, if an actuary is advising just one party in a transaction and is being asked to come up with arguments favouring a high (or low) discount rate to favour his or her client then we might expect the actuary to be creative in the arguments used to justify the proposed discount rate. However, in practice a significant proportion of actuarial work implicitly or explicitly seeks to balance the interests of several different and possibly conflicting parties to an arrangement. Advice on discount rate selection then needs to be more objective and impartial, with a greater premium on transparency, including effective communication of the risks involved.

The framework developed by the project recommends differentiating between purposes linked to (i) solvency assessment, (ii) estimating a 'fair' transaction value or (iii) funding (i.e. advice on accumulating assets in the largely hypothetical situation where we can ignore consideration of the likely sufficiency of these assets to the target future cash flows). It also recommends differentiating between liabilities that are (a) guaranteed, (b) constructive (in the sense that any reasonable going concern type assessment would expect them to arise, e.g. in a pensions context these might include the expected impact of future pay growth on accrued liabilities) or (c) discretionary (e.g. contingent on asset performance). The project Steering Committee recommended the following selections:

Cash flow type: Valuation purpose:	Guaranteed	Constructive	Discretionary
Solvency	Matching	_ ^[1]	_ ^[1]
Transaction	Matching	Matching	Matching
Funding^[2]	Budgeting	Budgeting	Budgeting

Notes:

[1] A matching framework would 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.

Development of the framework naturally focused on use of discount rates in actuarial strongholds such as life insurance and pensions. However, the principles are equally valid in wider fields. The key requirement remains effective communication and clear articulation of and linkage to the purpose of the exercise. For example, in asset management focus would normally be on market derived discount rates (and on subtleties linked to them, e.g. the existence of multiple types of swap rates varying both by currency and by tenor, i.e. deposit length, of the underlying cash rate) except when the individual was in effect being asked to form a view on whether the market price of an instrument was 'cheap' or 'dear'. In the wider business management context the focus can be more varied. For example, budgeting-style calculations might be given greater emphasis if part of wider budgeting or planning exercises. Whatever the field you practice in, we commend the output of this project as providing a framework that will help you make the best possible use of discount rates, a key technique in nearly every actuary's toolkit.

References

Cowling, C.A., Frankland, R., Hails, R.T.G, Kemp, M.H.D., Loseby, R.L., Orr, J.B. and Smith, A.D. (2011). Developing a Framework for the use of Discount Rates in Actuarial Work. *Presented as Sessional research meetings of the Institute and Faculty of Actuaries, January 2011*

Daykin, C. and Patel, C.C. (2010). Actuaries and Discount Rates. Presented at a Meeting of the UK Actuarial

Malcolm Kemp is currently Managing Director of Nematrian Limited, a company specialising in developing intellectual property and providing consultancy services to the financial services sector. He is an actuarial function holder for two life insurance companies and an Adjunct Professor at Imperial College Business School, London (where he teaches ERM). Until 2009 he was Executive Director and Head of Quantitative Research at Threadneedle Asset Management. Prior to working at Threadneedle, Malcolm was a partner at Bacon & Woodrow in their investment consultancy practice. Malcolm is a member of the Council of the Institute and Faculty of Actuaries.