Some Aspects of Superannuation Funding Standards In Australia
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1.

The technical content of this note is virtually entirely derived from a paper (see reference (1)) written by a colleague, Michael Hughes, and myself.

The subjective views set out in this note are my own.

2. Background

The majority of superannuation funds in Australia are lump sum funds; and many of those funds that are described as pension funds are to all intents and purposes lump sum funds because of widespread use of commutation.

The funding methods most commonly employed for medium to large defined benefit funds are aggregate funding, attained age normal funding and entry age normal funding. The precise definitions of these methods are set out in the Appendix.

In the main, actuarial bases may be described as "realistic", although usually no attempt is made to incorporate the current very high rates of investment and salary increases that exist in Australia. Typically, it is assumed that the 'real' long-term gap between rates of investment return and salary increase will be between ½% — 2% per annum.

Assets are valued on almost every conceivable basis:

Market value

Book value (which is effectively the same as cost value)

'Actuarial value' (For example, smoothed market value of discounted cash flow methods)

3. Observations

On any pragmatic criteria, the methods and assumptions adopted in Australia 'work'. It is, of course, very difficult to prove that our methods have worked. However, with one notable exception, there have been no reported cases of superannuation funds demonstrably failing to meet their objectives; and the one exception was caused by the unfortunate concurrence of a past service deficiency still being funded; generous retrenchment benefit provisions; the winding up of the company; a clause in the trust deed preventing the fund being wound up until 3 months notice had been given; and the retrenchment of the 3 most senior executives before the 3 month period had expired.

Notwithstanding our pragmatic success, there are a number of theoretical question marks over our methods.

Firstly, there is the sensitivity of the contribution rate to the assumed rate of investment return, the assumed rate of salary increase and (for pension funds) the assumed rate of pension increase. And yet, these first two items are quite impossible to predict with certainty; as is the third item if it is linked to a measure of the rate of inflation (and if it is not so linked then there is a rather difficult problem in benefit design). Our faith that the financial effects of departures of actual experience compared with our assumptions will even out has, by and large, been rewarded in practice but there remains (with me, at least) an uneasy feeling that thousands of millions of dollars should be controlled by more than faith alone.

Secondly, the lack of anything approaching consistency in our methods of valuing assets should, in my view, be a source of concern to the local profession. Our dilemma is, of course, understandable. To value at market value is open to criticism because of the inherent and seemingly ever increasing fluctuations; and yet to not value at market is to invite criticism that the value departs from "reality"; and/or is arbitrary.

Thirdly, the strength of our discounted cash flow techniques (that is, compressing a multitude of financial information into two or three numbers) is also its weakness: the emerging surplus or deficiency (or whatever terminology is used) is the capital value of income and outgo streams extending many years into the future, and yet they appear to be revenue items generated over the inter-valuation period.

Fourthly, the long term nature of the calculations appear to be at variance with a very short-term environment. Because of the small "real gap" in our assumptions, most of the financial significance of our calculations may well be twenty years into the future. On the other hand, Australian journalists write unselfconsciously about long term bonds maturing in 5 years' time; and the recent corporate environment has been characterised by take-overs and mergers (with subsequent reconstructions of superannuation funds) of a frequency and magnitude that would have been unthinkable five years ago.

The above four points are not entirely theoretical. I am aware of at least 3 reasonably substantial funds where the surplus has been in excess of the value of the liabilities. I am very grateful that the fluctuations did not go in the opposite direction!

There are two further relevant observations in respect of the Australian environment:

(a) Actuaries have extremely wide individual freedom as to the methods and assumptions that they may employ. Currently, this freedom is the subject of much soul-searching within the profession as to whether standards should be imposed. The most recent example was a workshop session at the 1981 Convention, the purpose of which was "... to explore some of the issues involved in superannuation fund reporting and hopefully to demonstrate a concensus view on which the Institute might build." Two of the five main topics for discussion were "a standard method" and "standard assumptions for the standard method."

(b) Accountants and the taxation authorities are placing the actuarial process under increasing scrutiny. Admittedly, the accountants are moving with glacier-like rapidity. The last official action of the accountants was an exposure draft presented to our Institute in May, 1978; and even that publication was precipitated by the actuaries rather than the accountants; which in turn moved a leading dignatary of one of the major accounting bodies to state to me that: "you actuaries are men of action". Ye gods! To be fair to the accountants, their activities in superannuation received a major set-back when their superannuation expert left Sydney for Queensland to become chief executive of the peanut farmer's lobby organisation. The taxation authorities have shown considerable zeal but their direction is slightly bizarre. To simplify the situation, funds have two choices: have contributions calculated by an actuary using his professional judgement; or use the Taxation Commissioner's basis of investment earnings of 10% per annum compound and salary increases of 4% per annum simple.

4. Modification of the traditional process

The points raised in the previous section have modified my approach to the superannuation funding process. In the first place, I consider that actuarial training and literature in the Australian environment does not place enough emphasis on the fact that superannuation is an exercise in *adaptive financial control.* Or to paraphrase Reddington's illuminating description: superannuation funding involves homing in on a constantly moving target.

Secondly, the use of indices is starting to become accepted by a number of actuaries in Australia. In our paper (see reference (1)) we adopted two indices:

(a) The ratio of assets to vested benefits. The purpose of this index was to prescribe a solvency test — if the ratio fell below 1 then the fund would be regarded as insolvent.

For our purposes we defined a member's 'vested benefit' as the minimum benefit that he would be paid

if he immediately left the fund voluntarily. We adopted market value for the method of valuing assets; and this seems reasonable for a test of solvency.

(b) The ratio of assets to accrued benefits. The purpose of this index is to provide a measure of the comparative financial strengths of different superannuation funds. For the purposes of our paper we defined the accrued benefit according to the formula: $B \times {}^{t}/_{n}$ where

B is the benefit as a multiple of final average salary that would be paid on retirement at the normal retirement date

t is the period of fund membership at the effective date

n is the period of fund membership at the normal retirement date.

Market value was adopted as the method of valuing assets as this seems to be the only method that will permit valid comparison between different funds.

5. Use of the indices

The primary use of indices is a means of communication. I have found that a number of trustees are more informed on the state of their funds by consideration of the indices rather than by a presentation on our traditional methods.

I consider that indices, rather than the calculated contribution rate, may be the area of common ground between actuaries and accountants. That is, funding standards should be expressed in terms of indices. In the exposure draft that I referred to earlier, the key item in calculating the employer's liability was to be the level of contributions to be paid. In the case of a defined benefit fund, the draft stated: ". . . the contributions to be paid shall be calculated by an actuary using:

(a) one of the funding methods set out in paragraphs 34 to 50; *(these included accrued benefit funding, aggregate funding, attained age normal funding, entry age normal funding, individual funding and annual premium funding)*

(b) actuarial assumptions appropriate to the current circumstances of the plan."

In the paper referred to earlier, we showed that the exposure draft's definition of liability allows such a range of methods and assumptions to be employed that identical funds may have widely different calculated liabilities, and still remain within the guidelines of the exposure draft. Conversely, we showed that another implication of the exposure draft's definition of liability is that two funds which have their liability measured with the same valuation methods and bases may have a relatively small difference in contribution rates and hence liability and yet the fund's financial position (as measured by the indices) may be significantly different.

These results are not surprising. In Australia flexibility in funding arrangements is encouraged; but the concept of financial liability is (ideally) fairly rigid.

A result that emerged from our paper was that for the particular actuarial assumptions in our standard basis, the ratio of assets to accrued benefits tends to a value close to one (after a reasonably short period of steady growth) under new entrant funding, aggregate funding and attained age normal funding, provided that the actual experience follows the actuarial basis chosen. This result surprised us, in that approximations to the actuarial reserve traditionally use a discount factor from the normal retirement age. The results of our projections were confirmed in another independent paper (2).

A pragmatic use of the indices is that of independent check on the traditional actuarial methods. As mentioned previously, I am aware of 3 funds with very high surpluses — in each case the level of the surplus was due to a combination of unusual circumstances. When confronted with such a situation, it is very comforting to have an independent method (i.e. indices) to assess the financial condition of the fund.

Finally, the use of indices enables the actuary to improve his understanding of the funding process. It is interesting in this regard that the four most recent papers to the Institute of Actuaries of Australia on superannuation, used indices extensively (see references (1), (2), (3) and (4)).

6. Alternative indices

Other indices have been suggested in the Australian context. The most popular variant is to use an "actuarial value" of the assets rather than market value. Whilst I can see some merit in an actuarial value for comparing the financial position of one fund at different points of time, I consider that market value is the obvious choice for a solvency test or for a comparison of the financial position of different funds.

Another decided advantage of market value is that it is considerably easier to communicate to outsiders than "actuarial value" — especially as "n" actuaries are almost certain to produce at least "2n" methods of calculating the actuarial value of assets.

Another variation is to use the maximum benefit payable on termination rather than the minimum value. In practice, this means replacing the resignation benefit by the retrenchment benefit. Such an index may have a number of legitimate uses, but is rather stringent for a solvency test.

Another variation for the financial strength index is to use the "present value of accrued benefits" rather than the accrued benefits. Again, this is a very useful index for a number of purposes, but compared to the index proposed in this note, it lacks simplicity, uniformity between different funds and it is more difficult to communicate to non-actuaries.

7. Conclusion

The traditional actuarial methods have a fine record of success to look back on. However for a variety of reasons the traditional methods are tending to come under attack within Australia's current commercial and economic environment.

This note suggests that indices are a powerful tool to use in Australia. In respect of funding standards, indices are superior to current methods because they are simple, are readily communicable to non-actuaries; can be calculated by non-actuaries and conceptually they record an immediate situation rather than being the present value of future events.

References

(1) "Some current aspects of superannuation funding" by M. M. S. Hughes B.Sc., F.I.A., A.S.A. and M. A. Stevenson, B.Sc., F.I.A., T.I.A.A. 1979.

(2) "In search of a reasonable pace of funding for defined benefit superannuation plans." by C. R. Grenfell, F.I.A., T.I.A.A. 1979.

(3) "Indices for measuring the funding of superannuation plans" by D. J. Solomon, M.A., F.I.A. A paper presented to the joint convention of the Institute of Actuaries of Australia and the New Zealand Society of Actuaries, in October, 1979.

(4) "The Development of Superannuation Reporting" by R. C. Palmer F.I.A., A.S.A., F.I.A.A. and H. A. McLeod B.A., F.I.A., F.I.A.A. A paper presented to the Institute of Actuaries of Australia, May 1981.

APPENDIX
Funding Methods

Aggregate funding

The present value of the future contributions of the employer and members, together with the present value of any existing assets of the plan, equals the present value of future benefits. The cost is thus spread over the future plan membership of the existing members. Employer contributions are usually expressed as a percentage of the salaries of members.

Algebraically, $c = \left(\frac{\Sigma B^{\alpha} - A}{C}\right) \times 100$

where c = the basic contribution rate of the fund expressed as a percentage of the salaries of members from time to time.

B^{α} = present value of benefits of existing members arising from decrement α.

A = the value of the assets of the fund.

C = the present value of future contributions of 1% of the salaries of existing members.

Attained age normal

In the first instance, the present value of the future contributions of employer and members equals the present value of benefits arising from future service. The cost of future service benefits is thus spread over the future plan membership of the existing members. Employer contributions for future service benefits are usually expressed as a percentage of the salaries of members.

The present value of benefits arising in respect of past service is compared with the value of the assets and any excess is met by a separately expressed contribution, often called the past service contribution. This past service contribution is commonly expressed as a fixed percentage of the salaries of members payable for stated number of years.

Algebraically, $c = \left(\frac{\Sigma BF^{\alpha}}{C}\right) \times 100$

$F(n) = \left(\frac{\Sigma BP^{\alpha}A}{\bar{a}_n}\right) \times 100$

where c, C and A have the same meaning as for aggregate funding; and where

BF^{α} = the present value of benefits of existing members arising from decrement α and in respect of future service.

$F(n)$ = the "past service" contribution payable for n years as a fixed percentage of the salaries of members

BP^{α} = the present value of benefits of existing members arising from decrement α and in respect of past service.

The rate of interest used in calculating $\bar{a}_n$ may be taken as the valuation rate of investment return less the valuation rate of salary increase less the assumed net rate of growth of membership of the fund.

Entry age normal funding

An employer contribution rate is first determined for a group of average new entrants (either actual or hypothetical), by making the present value of the contributions of the employer and members of the group equal to the present value of their future benefits. This contribution is called the 'normal' contribution rate and is usually expressed as a percentage of salaries.

Next the normal contribution rate is applied to the current membership of the plan to determine the 'normal' contribution. The procedure then continues, as under the aggregate method, by calculating the present value of future benefits for all plan members. The excess of this present value over the sum of:

(a) the present value of the assets and
(b) the present value of the normal contribution

is then expressed as an additional employer contribution, which is usually expressed as a fixed percentage of the salaries of members payable for a constant number of years.

Algebraically, $c = \left(\frac{\Sigma NB^{\alpha}}{NC}\right) \times 100$

$F(n) = \left(\frac{\Sigma B^{\alpha}A - cC}{\bar{a}_n}\right) \times 100$

where c, $F(n)$, B^{α}, A, C and $\bar{a}_n$ have the same meaning as for aggregate funding and attained age normal; and

where NB^{α} = the present value of benefits of the average distribution of new entrants, arising from decrement α.

NC = the present value of a contribution of 1% of the salaries of the average distribution of new entrants.