Reserves for Future Claims in Group Life Portfolios

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Group Life insurance claims for lump sum Total and Permanent Disablement benefits are substantially higher than ten years ago. This paper demonstrates that the claim reserves equal to about one year's risk premiums may now be needed for a mature portfolio of corporate superannuation policies. Delays in reporting claims are even longer under Industry Superannuation plans, causing higher reserves to be required, perhaps 150% of one year's risk premiums. Factors are suggested that group insurers may need to consider before choosing a level of reserves that is appropriate for their own blocks o business.

Keywords: group life insurance, industry superannuation, claim reserve, IBNR, total and permanent disability, long tail business

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1 | Introduction

It is almost ten years since Australian actuarial literature last included notes on the level of reserves needed for future claims in a lump sum group life insurance pool. Tony Jones wrote on 'Claim Delays under Industry Fund Group Life' in the September 1992 Quarterly Journal (Jones 1992) and Lindsay Smartt followed up by writing on 'Long Tail Group Life Business' in the September 1993 Quarterly Journal (Smartt 1993).

The author first spoke on this subject in the discussion of the 1985 sessional paper 'Group Life Insurance' by Bruce Edwards and Steve Willcock (TIAA 1985, p 327), expressing the view that:

> '[T]he claim reserve for reported and IBNR [Incurred But Not Reported] TPD [Total and Permanent Disablement] claims at the end of a policy year needs to be around 40% of premiums.'

There was further discussion of this point at the session of the May 2001 Convention on the paper 'Group Life Experience Study, 1 January 1995 – 31 December 1997' by Michael Dermody (see Dermody 2001). The author expressed a view that there had been a heavy increase in Total and Permanent Disablement (TPD) claims experience in the period since 1985. This meant that the total claims reserves needed for a mature portfolio of corporate superannuation plans had increased to about one year's risk premium, while the reserve needed for Industry Superannuation plans was considerably higher at around one and a half year's risk premium. The derivation of the 100% and 150% reserving estimates can be readily demonstrated, without revealing any confidential information. It is presented in this Note to help continue a useful discussion.

In private conversations, other actuaries at the 2001 meeting expressed interest in those calculations and hinted that they themselves were not reserving at such a high level. This was not a new point. Jones' and Smartt's Notes to the Quarterly Journal in the early 1990s had reminded readers that group life is long tailed and

needs adequate reserves. The danger in 2001 was the same as it had been in 1985. If a company is under reserving, it is probably also under pricing. The company may be forced to report losses when it eventually recognises the true cost of claims.

2   Corporate Group Life Insurance Plans

The estimated claim reserves of one year's risk premium for a portfolio of corporate plans was based on an assumption that payments would follow the claim patterns below[1]:

Reserve Needed for Death Claims

- Average period of delay in reporting is around three months

- Implied claim reserve needed at end of first year is 25% of risk premium for death.

Reserve Needed for Total and Permanent Disability Claims

- No claims will be paid in the 6 month waiting period after the member ceases work[2]

- 50% of claims will be paid in the period 7 months to 18 months after ceasing work

- 35% will be paid from 19 to 30 months

- 10% will be paid from 31 to 42 months

- 5% of claims will be paid from 43 to 54 months

- Implied claim reserve at the end of the underwriting year is 87.5% of the TPD risk premium[3]

- At the end of the second year it becomes 41.25% of the TPD premium for the u/w year

- At the end of the third year, 12.50 %

- At the end of the fourth year, 3.75%

- At the end of the 5th year, Nil

Portfolios of group life plans generally comprise policies providing death cover only, and policies that provide both death and TPD cover. The KPMG experience analysis reported by Dermody shows that death and TPD plans are in the large majority. Death-only cover makes up about 20% of the exposure and death and TPD about 80%. It is thus necessary to develop claim reserves for plans providing both death and TPD benefits.

Reserve Needed for Combined Death and TPD Claims

- The KPMG combined results for group life insurers show that the industry pays out around $150 in TPD claims for each $100 in death claims.

- Claims estimates have been developed working from the assumption that death risk premium (RP) is 40% of the total and TPD RP is 60% of the total. This means that;

- At end of the underwriting year, overall reserve = .25 x 0.40 + .875 x 0.60 = 62.5% of RP

- At end of second year, reserve = .4125 x 0.60 = 25% of the RP from the underwriting year

- At end of third year, reserve required = .125 x 0.60 = 7.5% of RP

- At end of fourth year reserve = 2.5% of RP for the original underwriting year.

- If the group pool is of static size, ie. the risk premium is the same each year, then the total reserve[4] would be the sum of all of these, or 97.5% of one year's risk premium.

The derivation is then complete. It can be concluded that approximately one year's risk premium is needed as a suitable claims reserve for an established portfolio of corporate group life insurance plans.

3. Other Considerations for Corporate Business

Working through the basic derivation is just the start. The reserve estimate of 100% of risk premium needs to be adjusted for the particular characteristics of any real group life portfolio. The next few paragraphs give examples of some of the adjustments that might need to be considered.

Rapid Growth

If the group pool has been growing rapidly, the reserve needed would be a smaller percentage of the final year's risk premium. For example, the 100% reserve estimate becomes 90% of one year's risk premium if the pool has been growing at a rate of 20% pa.

Use of Office Premium in Place of Risk Premium

About 20% of the total group insurance premiums may represent loadings to pay for commission and stamp duty. Thus a reserve for future claims of 100% of the annual risk premium might be translated to 80% of gross premium. (Naturally, the correct percentage would need to be separately determined for each insurer.)

It may be noted that the calculations throughout this Note regard expense loadings as part of the risk premium. This is because a large part of the expense loading is needed to meet the costs of assessing and managing claims.

Chain Ladder Analysis

This Note contends that group insurance has a medium to long tail. The derivation of an appropriate claim reserve in Section 2 above is little more than a 'back of the envelope' calculation. A group life product actuary could readily apply more sophisticated tools to a company's own pool of business. Long tailed business naturally lends itself to chain ladder and similar methods of analysis.

Use of Lower Reserves in Practice

Discussions at the 2001 Convention indicated that some company claim reserves may in practice have been set considerably lower than suggested in this Note. The simple form of analysis shown here can be applied to any run off pattern that may be chosen. It is instructive to consider the results if a much faster run off is assumed. The alternative pattern used for TPD claims was

- 75% TPD payments between 7 and 18 months of ceasing work

- 25% between 19 and 30 months.

Applying this pattern would lead to requiring claim reserves in a combined Death and TPD pool of 58.75% of risk premium at the end of the underwriting year and 11.25% at the end of the subsequent year. In other words, the total reserve requirement for a mature portfolio would still be 70% of one year's risk premium. (The derivation of this particular set of reserves is demonstrated in an Appendix to this Note.) Practical experience suggests that the run off pattern in this example would be unrealistically short tailed in most group life portfolios[5]. In the absence of very strong evidence to the contrary, reserves lower than 70% of a year's risk premium would be too optimistic.

4 | Industry Superannuation Plans

Industry superannuation plans tend to have rather longer tails than corporate plans. The methodology above has been reapplied allowing for the final TPD claims to run off by the end of the 7th year, although in reality some late claims will still filter through after 10 years and even longer.

Death Claims Pattern

- 60% of death claims will be paid in the period up to 6 months after date of death

- 30% will be paid from 7 to 18 months

- 10% will be paid from 19 to 30 months

TPD Claims Pattern

- No claims will be paid in the 6 month waiting period after the member ceases work

- 36% of claims will be paid in the period 7 months to 18 months after ceasing work

- 24% will be paid from 19 to 30 months

- 18% will be paid from 31 to 42 months

- 12% will be paid from 43 to 54 months

- 6% will be paid from 55 to 66 months

- 4% will be paid from 67 to 78 months

These factors lead to the estimate that claim reserves for a mature industry superannuation plan would eventually level off at around 150% of one year's risk premium.

In practice, industry plans are of very large size and almost always have unique features. The approximation of a year and a half's risk premium should never be used without due consideration to the special circumstances of each case. For example, the chain of communication for an industry plan is longer than for a single company plan. This is one reason why the assumed delay for reporting and settlement of death claims has needed to be lengthened. The pattern shown above should be checked before being used. Industry super plans sometimes have different sums insured for death and TPD, so that the assumption of a 40/60 split between the risk premium for death and for TPD would need to be examined. Industry plans do not usually pay commission. This means that the risk premium is the same as the gross premium, so that there is no need for the 80% scaling down factor discussed above.

5 | Comparison with Results from Jones and Smartt

Jones' note of September 1992 concentrated on claim run-offs under industry superannuation funds. Industry superannuation began from 1986 with the first 3% of what are now known as Superannuation Guarantee Contributions. Jones tracked experience of claims incurred in calendar quarters starting from the first quarter of 1988. He tracked claims by quarters of delay out to the end of quarter 12 (ie. three years from date of 'event') and showed a final entry for 12+ quarters. Five quarters of claims occurrences had reached the 12+ delay point at the time his Note was written.

Comparing the claim pattern suggested in Section 4 above with Jones, the present Note has assumed that death claims would be reported and settled faster than Jones found. This is justified by increased efficiency in the administration of Industry Superannuation plans. On the other hand, the current note has assumed a substantially longer tail of TPD claims. This is justified as nobody involved at the early stages of industry superannuation had seen evidence of just how long the TPD tail would be.

Smartt's analysis of September 1993 reported on corporate superannuation plan results as well as industry superannuation plan results. However, Smartt's Note was not as useful as Jones' for developing claim-reserving parameters. Smartt focused on the delay period in reporting claims, whereas in developing claim reserves it is more important to know the delays until payment of claims. Jones' longer paper contained analysis of two delay periods; delay to reporting and delay to settlement. One year after Jones' Note, Smartt was more aware of the need to allow for the longer tail of business and gave an early warning against the use of a three year cut-off point for claims.

This Note is written with the benefit of further hindsight. It warns even more strongly to look at the tip of the tail before determining reserves. It does not give any fresh samples of actual

run-off experience, suggesting instead that each actuary should carefully analyse his or her own experience.

6   Conclusion

Figures in this Note show readers the order of magnitude of claim reserves needed for pools of lump sum group insurance business. The calculations behind the numbers are straightforward and can be used with any claims run-off pattern. Readers may care to share their views on the validity of the run-off factors illustrated herein.

There are other lines of group insurance business where advice on claims reserving practice would be helpful to actuaries. The pattern of claim delays in group salary continuance (GSC) is one example. Another is the master trust schemes that have emerged and developed over the past ten years. One might speculate that the claims experience of master trust schemes should differ from both corporate plans and industry superannuation plans. Readers may be able to provide insights into these products.

References

Dermody M. 2001, 'Group Life Experience Study 1 January 1995 – 31 December 1997', *IAAust 2001 Convention.*

Edwards B. & Willcock S. 1985, 'Group Life Insurance', *Transactions of the Institute of Actuaries of Australia.*

Jones T. 1992, 'Claim Delays under Industry Fund Group Life', *IAAust Quarterly Journal*, September, 1992.

Smartt L. 1993, 'Long Tail Group Life Business', *IAAust Quarterly Journal*, September, 1993.

Endnotes

[1] The patterns are arbitrary, but have been checked for reasonableness against claim results from a large group life portfolio including a small volume of Industry superannuation. The actual experience showed a slightly longer tail pattern for both TPD and death claims, that would have suggested reserves approximately 15% higher than derived in Section 2 of this Note.

[2] In practice, some claims are admitted and paid early where the member is found to have a terminal illness. It is not entirely clear whether these represent early payment of a death claim or early payment of a TPD claim. Other early payments are more clearly early TPD payments, eg. early payments due to loss of limbs or loss of eyesight. The number of early payments for all these cases combined is so small that they can be ignored for the purposes of this Note.

[3] The derivation of reserve percentages is shown in an Appendix, using the simpler case discussed in Section 3 of this Note.

[4] This is sometimes referred to as an Incurred But Not Reported (IBNR) reserve. More correctly, as derived through this Note, it represents a total reserve, ie. it is enough to cover both RBNA (Reported But Not Admitted) and IBNR claims.

[5] It may be speculated that some group arrangements, eg. MasterTrust arrangements will have shorter tails than corporate superannuation business. The author considers that the tail illustrated would be too short even for a MasterTrust.

Appendix - A Worked Example

Death Claims Settled Rapidly - TPD Claims Settled with a Short Tail

This Appendix shows the working of the simplest example provided in Section 3 of the Note.

A | **Reserves Required for Future Death Claim Payments**

Assumption:

Three month's delay between date of death and date of payment

In Year of Death

All deaths in first 9 months have been settled by year end

No deaths in final 3 months have been settled by year end

In total 75% of deaths have been settled in the year

Reserves required at the end of the year to cover death
claims still to be paid   25%

In Subsequent Development Year

The remaining 25% of deaths are settled in the first
subsequent development year, ie. the second year

Reserve required at the end of the second year   Nil

B | **Reserves Required for Future TPD Claim Payments**

Assumptions:

Nil claims paid in the period 0 to 6 months after ceasing work

75% of claims paid in period 7 to 18 months

25% of claims paid in period 19 to 30 months

In Year of Ceasing Work

50% of claimants cease work in the first 6 months. These lives will have been off work for between 6 and 12 months at the end of the year. For these lives, assume half of 75% of claims are paid in the second half of the year. Claims paid are thus 0.5 (0.5 x 75%) = 18.75%

50% cease work in the second six months. For these lives, as all are in the first six months off work, assume nil claims have been paid.

Total claims paid by the end of the year of
claim occurrence = 18.75% + Nil   18.75%

Claim reserve needed = 100% - 18.75%   81.25%

In First Subsequent Development Year (ie. Year 2)

For the 50% of claimants who ceased work in the first 6 months of the underwriting year:

   37.5% of claims are paid in the first half year: 0.5 x 37.5% = 18.75%
   12.5% of claims are paid in the second half year: 0.5 x 12.5% = 6.25%

For the 50% of claimants who ceased work in the second six months of the underwriting year:

   75% of claims are paid in the year: 0.5 x 75% = 37.5%

Total claims paid in the year   62.5%

Cumulative claims paid to the end of the
second year = 18.75% + 62.5%   81.25%

Claim Reserve needed = 100% - 81.25%   18.75%

In Second Subsequent Development Year (ie. Year 3)

For the 50% of claimants who ceased work in the first 6 months of the underwriting year:

   12.5% of claims are paid in the first half year: 0.5 x 12.5% = 6.25%

For the 50% of claimants who ceased work in the second six months of the underwriting year:

25% of claims are paid in the year:	0.5 x 25% = 12.5%

Total claims paid in the year	18.75%

Cumulative claims paid to the end of the second year = 18.75% + 62.5% + 18.75%	100%

Claim Reserve needed = 100% - 100%	Nil

C   Reserves Required for Future Death & TPD Claim Payments

Assumption:

Total risk premium (RP) is made up of 40% for deaths and 60% for TPD claims

Reserve required at end of the underwriting year, (ie. the first year)

Reserve for future death claims = 25% x 40% of total risk premium	10% of RP(1)

Reserve for future TPD claims = 81.25% of 60% of total risk premium	48.75% of RP(1)

Total claim reserve required	58.75% of RP(1)

Reserve required at end of the second year

Reserve for future death claims = 0% x 40% of total risk premium	Nil

Reserve for future TPD claims = 18.75% x 60% of total risk premium	11.25% of RP(1)

Total claim reserve required	11.25% of RP(1)

Reserve required at end of the third year

Reserve for future death claims = 0% x 40% of total
risk premium   Nil

Reserve for future TPD claims = 0% x 60% of total
risk premium   Nil

Total claim reserve required   Nil

D   ## Total Reserves Required for a Whole Portfolio after Three Years

58.75% x RP(3) + 11.25% x RP(2) + Nil x RP(1)

If RP is the same each year, then RP(1) = RP(2) = RP(3) = RP

Total reserve required = (58.75% + 11.25%) x RP   70% of RP

E   ## Allowing for Uniform Spread of Claim Occurrences and Payments

The derivation above, and in the body of the Note, has been oversimplified. It would be more realistic to allow for the month of occurrence of each claim rather than to bundle together all TPDs for two half year periods. It would also be more realistic to assume that death claim payments are made uniformly over the period of one to six months after death. If these two changes are made, the death claims reserve reduces and the TPD claims reserve increases. The net result is that the overall reserve would then increase from the 70% shown above (and reported in the text) to 81% of RP.