GENERAL INSURANCE PRACTICE COMMITTEE

Technical Paper: Discount Rates and Inflation Assumptions for PS300 Claim Liabilities

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1. Status of Technical Paper

This Technical Paper is intended to assist actuaries undertaking a valuation of General Insurance Claims for an Entity in accordance with Professional Standard 300 (PS 300). It discusses some considerations regarding discount rates, inflation assumptions and the interaction with accounting standards and other applicable legislation. It is not intended to be a comprehensive review of all issues to do with economic assumptions, but addresses some key points that actuaries need to be aware of.

This Technical Paper is not a Professional Standard, and. while it is relevant for liabilities derived to comply with accounting standards, it does not constitute accounting advice. Capitalised terms have the same meaning as that shown in Section 3 of PS 300.

2. Background

PS 300 includes the following relating to the selection of financial assumptions for claim liabilities:

> **10.2 Economic assumptions**
>
> 10.2.1 The Member must allow for any future escalation of Claim Payments (often called "claim inflation"). Whether the allowance is explicit or implicit will depend on the valuation methods being used. The escalation assumptions must consider:
>
> (a) wage and/or price inflation; and
>
> (b) superimposed inflation (any residual claim inflation arising for reasons other than wage and/or price inflation).
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> 10.2.2 Legislative and/or regulatory requirements may prescribe whether Claim Payments are to be discounted. The Member must consider the purpose of the valuation and document whether the future Claim Payments are to be discounted. Discount rates used must be based on the redemption yields of a Replicating Portfolio as at the valuation date, where reasonably practicable.
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> 10.2.3 If the projected payment profile of the future Claim Payments cannot be replicated (for example, for Classes of Business with extended run-off periods), then discount rates consistent with the intention of clause 10.2.2 must be used, subject to any legislative and/or regulatory requirements.
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> '**Replicating Portfolio**' means a notional portfolio of current, observable, market-based, fixed-interest investments of highest credit rating, which has the same payment profile (including currency and term) as the relevant claim liability being valued.

In addition, PS 300 also includes the following regarding the interaction of the Standard with other requirements:

> **1.6 Legislation and other requirements**
>
> 1.6.1 This Professional Standard must be considered in the context of applicable legislation. If there is a conflict between this Professional Standard and any applicable legislation, then the legislation takes precedence, and any differences must be documented in the Report. In this context, legislation includes regulations, prudential standards, subordinate standards, accounting standards, rules issued by government authorities and standards issued by professional bodies which have the force of law. Clauses 1.6.3 to 1.6.7 indicate specific examples of such legislation that may affect the work undertaken under this Professional Standard.
>
> 1.6.2 A reference to legislation or a legislative provision in this Professional Standard

includes any statutory modification, or substitution of that legislation or legislative provision and any subordinate legislation issued under that legislation or legislative provision. Similarly, a reference to a Professional Standard includes any modification or replacement of such.

1.6.3 The Act provides for APRA to issue prudential standards regulating the activities of, and imposing requirements on, authorised general insurers and Level 2 Insurance Groups (as defined by APRA). APRA Prudential Standards mandate valuations of General Insurance Claims for authorised general insurers and Level 2 Insurance Groups, with regard taken of the relevant Professional Standards of the Institute.

1.6.4 Valuation estimates of General Insurance Claims for self-insurers, specialised insurers, insurance pools and/or accident compensation schemes are required by various Commonwealth, State and Territory authorities in Australia.

1.6.5 In countries other than Australia, a valuation of General Insurance Claims may be required by regulators or government authorities.

1.6.6 In certain cases, the valuation of General Insurance Claims and the accompanying Report will be subject to External Peer Review, which must be undertaken in accordance with the Institute's Professional Standard 315 (External Peer Review of General Insurance Liability Valuations).

1.6.7 Actuaries undertaking a valuation of General Insurance Claims for authorised general insurers have legal obligations to report certain matters or information to APRA. These obligations are referred to as "whistleblowing". The obligations, details about what must be reported, related powers and protections are provided in section 49A of the Act. Members need to understand the obligations that apply to them in their circumstances. This may require Members to seek legal or other professional advice.

While they are not strictly relevant to PS 300, accounting standards can provide further guidance as to appropriate practice in determining discount rates. Noting that they apply in different circumstances, the relevant standards are AASB 1023 (General Insurance Contracts), its successor AASB 17 and AASB 137 (Provisions, Contingent Liabilities and Contingent Assets).

On discount rates, AASB 1023 states:

6.1 The outstanding claims liability shall be discounted for the time value of money using risk-free discount rates that are based on current observable, objective rates that relate to the nature, structure and term of the future obligations.

6.1.1 The discount rates adopted are not intended to reflect risks inherent in the liability cash flows, which might be allowed for by a reduction in the discount rate in a fair value measurement, nor are they intended to reflect the insurance and other non-financial risks and uncertainties reflected in the outstanding

claims liability. The discount rates are not intended to include allowance for the cost of any options or guarantees that are separately measured within the outstanding claims liability.

6.1.2 Typically, government bond rates may be appropriate discount rates for the purposes of this Standard, or they may be an appropriate starting point in determining such discount rates.

AASB 17 considers discount rates in some detail and the reader is referred to the Standard and accompanying guidance.

AASB 137 includes the following:

> The discount rate (or rates) shall be a pre-tax rate (or rates) that reflect(s) current market assessments of the time value of money and the risks specific to the liability. The discount rate(s) shall not reflect risks for which future cash flow estimates have been adjusted.

Finally, in December 2012, the LIWMPC and GIPC jointly issued an Technical Paper covering the derivation of discount rates for APRA capital standards[1]. While that Technical Paper applied to the specific issue of actuarial liabilities calculated in accordance with GPS 320, the principles regarding the derivation of discount rates are also relevant for valuations of General Insurance Claims more broadly.

3. Summary of Conclusions

In the absence of any conflict with applicable legislation, valuations of General Insurance Claims must be calculated in accordance with the requirements of Section 10.2 of PS 300. In implementing these requirements, Members should consider the following when determining discount rates and inflation assumptions:

- the principles described in the Technical Paper: Discount Rates for APRA Capital Standards issued in December 2012;
- methods for extrapolating yield curves, for example, those described by New Zealand Treasury[2], Mulquiney and Miller[3] and EIOPA[4].

Where allowance for future escalation of Claim Payments is made, the Member should consider the drivers of inflation. For example, these may be State or Territory-specific, related to general price or wage inflation, or to more specific sources such as medical and treatment inflation. In circumstances where "economy-wide" inflation assumptions are used, they should

[1] See http://www.actuaries.asn.au/Library/Standards/GeneralInsurance/2012/LIWMPC_GIPC_DiscountRateLAGICDec2012.pdf

[2] See http://www.treasury.govt.nz/publications/guidance/reporting/accounting/discountrates for details

[3] See http://www.actuaries.asn.au/Library/Events/GIS/2012/GIS2012PaperMulquineyMiller.pdf and http://www.actuaries.asn.au/Library/AJAP/2014/AJAPVolume1.pdf

[4] See https://eiopa.europa.eu/Publications/Standards/Technical%20Documentation%2027%20October%202015.pdf

be consistent with the nominal discount rates described above[5], taking into account break-even inflation rates implied by index-linked bonds, adjusted where appropriate for any difference in the inflation underlying the index-linked bonds and the inflation underlying the liability.

In circumstances where applicable legislation is deemed by the Member to conflict with the requirements of Section 10.2 of PS 300, the Member is reminded that:

- Paragraph 1.6.1 of PS 300 requires the conflict to be documented in the accompanying Report, with accepted practice requiring prominent disclosure of the lack of compliance with Section 10.2 of PS 300; and

- Accepted practice is to derive an estimate of the valuation in accordance with the principles described in PS 300 and this Technical Paper and display it prominently in the accompanying Report.

4. Discussion

4.1. Interaction with Accounting Standards

AASB 1023 provides clear support for the use of risk-free discount rates, consistent with those prescribed by PS 300.

At the time of writing, AASB 17 had just been released, applying to reporting periods commencing on or after 1 January 2021. For most general insurance contracts, AASB 17 allows discount rates to be determined using either a "bottom-up" approach, based on risk-free yield curves, or a "top-down" approach based on the returns implicit in a reference portfolio of assets. This Technical Paper applies to the selection of discount rates using the "bottom-up" approach, as well as the inflation assumptions underlying estimated fulfilment cash flows.

While AASB 137 refers to the "time value of money", it also allows for "risks specific to the liability". There are reasonable arguments for lower than risk-free rates but in practice, the adjustment has often been upwards, reducing the value of the liability relative to those calculated using risk-free rates. There is no clear consensus on exactly what the phrase "risks specific to the liability" means and consequently what adjustments should reasonably be made to risk free discount rates.

Where a Member is requested to use financial assumptions inconsistent with the requirements of Section 10.2 of PS 300, on the basis that such an approach is deemed compliant with AASB 137, the Member should clearly state that such liabilities are not consistent with PS 300 and should prominently disclose the value of liabilities that results from the application of Section 10.2 of PS 300 in the relevant Report.

[5] See http://actuaries.asn.au/Library/AJAP/2017/AJAPFinal.pdf

In this regard, Members are reminded of the matters specified in paragraph 1.2.3 of Practice Guideline 1 General Actuarial Practice:

> Nevertheless, if the Professional Services[6] provided by a Member are covered to any extent by this PG, a Member should consider explaining any significant departure from this PG to the Principal, and document such explanation.

4.2. Inflation

While PS 300 notes that projected claims inflation must be allowed for and requires consideration of price, wage and superimposed inflation, no further guidance is provided. As a simple consequence of the mathematics of inflating and discounting projected future cash flows, we can make the following observations:

1. the assumed level of prospective inflation is of equivalent importance to the discount rate; and

2. the inflation and discount rate assumptions should be compatible.

When setting inflation assumptions, the Member should consider the drivers of inflation. For example, these may be State or Territory-specific, related to general price or wage inflation, or to more specific sources such as medical and treatment inflation.

Where general price or wage inflation assumptions are used, they should be consistent with the nominal discount rates derived in accordance with PS 300 and this Technical Paper. This will generally involve consideration of break-even inflation rates implied by index-linked bonds, adjusted where appropriate for any difference between the inflation underlying the indexed-linked bonds and the inflation underlying the liability

In circumstances where general inflation measures are not directly appropriate, inflation assumptions should be set relatively, taking into account the drivers of inflation. For example, when considering a Workers Compensation portfolio in the Northern Territory, the relevant starting point may be to consider the relativity of past Northern Territory specific wage indices to the general inflation index, and then apply that relativity to market-consistent prospective general inflation measures, as described above. If liabilities for wages and treatment are separately analysed, then it may be desirable to reference both wage and medical inflation indices in assumption setting.

4.3. Superimposed Inflation

Superimposed Inflation (SI) relates to the difference between the economic inflation index that

[6] 'Applicable Professional Services' are defined as:
a. Prescribed Actuarial Advice; and
b. Professional Services that are designated in an Institute Professional Standard or Practice Guideline as being Applicable Professional Services.

is used, and the expected rate of claims cost escalation that is built into the valuation model. It can be constructed in any way that suits the modelling.

SI might ordinarily be thought of as a simple rate per annum of growth, in a similar way to how economic inflation forecasts are typically expressed. It can however be expressed in more complex ways that represent a model of how the drivers of SI operate.

The estimation of SI is nearly always particular to the individual portfolio being valued, and needs to be derived that way wherever possible. However, the environmental factors that partially contribute to SI will be industry-wide (for example, judicial or societal) and therefore benchmarking of SI experience of similar portfolios across different entities is relevant.

4.4. Long Dated Cash flows

While the selection of risk free discount rates past the term of the longest available sovereign bond is obviously not as simple as where market based yields can be observed, this issue is not insurmountable. New Zealand Treasury[7] produces discount curves for terms of 50+ years for use in valuing insurance claims liabilities. Mulquiney and Miller[8] have demonstrated methods to extrapolate the yield curve past the latest quoted security, and EIOPA have specified[9] a methodology for discount rate setting in European insurance and pension markets.

While these sources demonstrate that yield curves materially consistent with replicating bond portfolios can be constructed, other methods considered by the Member to produce discount rates materially equivalent to that required by paragraph 10.2.2 of PS 300 are also accepted practice (including the approach specified in APRA Standard GPS 320).

4.5. "Asset-based" Discount Rates

PS 300's use of highest credit rating bond yields (denoted for simplicity hereafter as "risk-free") as discount rates is consistent with finance principles and supported by market participants throughout the world. In particular, it is well recognised that the value of a liability is independent of the existence or form of assets considered to fund the liabilities. Consequently, risk-free interest rates are appropriate for discounting future liability cash flows.

That said, it is important to recognise that other discount rates may be appropriate in other circumstances, such as pricing, but this Technical Paper is concerned with the derivation of liability estimates.

In particular, discount rates should not be based on expected returns of risky asset portfolios, despite the arguments used to justify the use of other than risk-free discount rates, including:

(a) The cash flows underlying the liability have longer terms than the longest sovereign

[7] See http://www.treasury.govt.nz/publications/guidance/reporting/accounting/discountrates for details
[8] See http://www.actuaries.asn.au/Library/Events/GIS/2012/GIS2012PaperMulquineyMiller.pdf and http://www.actuaries.asn.au/Library/AJAP/2014/AJAPVolume1.pdf
[9] See https://eiopa.europa.eu/Publications/Standards/Technical%20Documentation%2027%20October%202015.pdf

bonds and so replicating portfolios are not possible;

(b) Risky assets such as equities are perceived to "match" liabilities and consequently expected portfolio returns can be used as discount rates;[10]

(c) Independent of the perceived hedging properties of certain asset classes, the expected return on asset portfolios intended to meet liabilities shows the "reality" and so should be used to discount future cash flows; and

(d) Risk-free rates introduce "unnecessary" or "misleading" volatility into liability estimates, especially for those with long durations. Such volatility can lead to adverse public or political perceptions as to the funding of a scheme.

The claim that equity portfolios "match" long duration inflation linked liabilities is often made without justification, or perhaps based on economic relationships between wages and profit shares of the economy. However, the evidence does not support this approach.[11] Equities do not match inflation linked liabilities, especially in the sense of the replicating portfolio required under PS 300.

Putting aside the fallacy of equities matching liabilities, the argument that liability discount rates should depend on the characteristics of an asset portfolio is inconsistent with economic fundamentals.[12.] Liability values do not change when an independent pool of assets is reallocated or expectations of asset class returns change.

While one can predict particular returns from a risky asset portfolio, they are not guaranteed by definition and consequently cannot be used to determine the value of a stream of cash flows that is independent of those asset values. If any participant values an expected cash flow stream with practical certainty, at anything less than its risk free discounted value, then an arbitrage opportunity will arise.

Recent market outcomes have resulted in volatile interest rates and consequently even more volatile long duration liabilities. While stability is generally preferred by most stakeholders, artificial stability that masks underlying risks so that they are not observed, and therefore cannot be managed, is problematic. It is important to recognise that volatility in funding position is an explicit choice of the scheme's governors. By definition, a replicating portfolio of highest credit quality (probably inflation linked) bonds will be closely linked with the economic value of the liabilities. Of course, variations between expected and actual cash flows will occur (random variation in claim distributions, real claim inflation differing from expectation etc), but these variations are generally dwarfed by asset-liability mismatch risk.

It must be noted that scheme governors can still choose to pursue risk premia through mismatched strategies (investment strategy is independent of liability discount rates), but it is critical for all stakeholders to be aware of the risks that are being taken. While changes in the

[10] Note that PS300 generally considers liabilities that are not directly linked to the performance of an underlying asset pool; e.g. investment-linked contracts offered by life insurers.

[11] See https://www.fiig.com.au/news/2013/05/09/choose-your-bubble-wisely

[12] See http://www.economist.com/blogs/buttonwood/2013/05/pensions-0 for a readable summary

market's assessment of the time value of money might be distracting or inconvenient, the resulting economic reality should not be masked.

Finally, while it is not generally stated as a justification for the use of higher, non-risk-free discount rates, the obvious consequence of lower liability estimates is that they are likely to be attractive to more stakeholders. In practice, this can lead to "actuary shopping" where actuaries prepared to use the highest discount rates are preferred.

End of Technical Paper