Discount Rate

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This IFRS17 Working Paper aims to facilitate discussion among actuaries and other stakeholders to capture the range of opinions on the application of IFRS17 in the Singapore context and is not meant to serve as mandatory practice notes.

Any interpretation of IFRS17 set out in this Paper represents a plausible treatment given the text of IFRS17. However, it shall neither be construed as the only possible treatment nor the agreed interpretation for Singapore insurers. Users of this Working Paper shall be mindful that differences in the exact fact pattern and operating context facing each insurer may drive different interpretations. Users shall also be mindful that for the same fact pattern and operating context, there is scope for the substance of same transaction to be articulated differently depending on how the transaction is analysed. (For example, in substance, cash flows from a call option with strike price $X on an asset is equivalent to the combined cash flow from the underlying asset and a put option with strike price $X on the asset, less cash of $X.) Differences in articulation can give rise to a range of plausible treatments. An insurer remains responsible for justifying its choice of treatment after discussion with its auditor. Opinions expressed in the working papers are not representative of that of the Singapore Actuarial Society.

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1. IFRS 17 Standards

The valuation discount rate is one of the key assumptions in determining the value of insurance contract liability, including the contractual service margin ("CSM") for life business.

Under IFRS 17, there is no prescribed method for calculating the discount rate to be used but there is a need to disclose the methodology. Discount rates are defined in IFRS17 as follows:

Paragraph 36
An entity shall adjust the estimates of future cash flows to reflect the time value of money and the financial risks related to those cash flows, to the extent that the financial risks are not included in the estimates of cash flows. The discount rates applied to the estimates of the future cash flows described in paragraph 33 shall:

(a) reflect the time value of money, the characteristics of the cash flows and the liquidity characteristics of the insurance contracts;

(b) be consistent with observable current market prices (if any) for financial instruments with cash flows whose characteristics are consistent with those of the insurance contracts, in terms of, for example, timing, currency and liquidity; and

(c) exclude the effect of factors that influence such observable market prices but do not affect the future cash flows of the insurance contracts.

Discount rates can vary across different portfolios:

Paragraph B74
Estimates of discount rates shall be consistent with other estimates used to measure insurance contracts to avoid double counting or omissions; for example:

(a) cash flows that do not vary based on the returns on any underlying items shall be discounted at rates that do not reflect any such variability;

(b) cash flows that vary based on the returns on any financial underlying items shall be:

(i) discounted using rates that reflect that variability; or

(ii) adjusted for the effect of that variability and discounted at a rate that reflects the adjustment made.

(c) nominal cash flows (ie those that include the effect of inflation) shall be discounted at rates that include the effect of inflation; and

(d) real cash flows (ie those that exclude the effect of inflation) shall be discounted at rates that exclude the effect of inflation.

2. Interpretation of Standards

The chosen discount rates should be market consistent and reflective of both the characteristics of the cash flows and the liquidity characteristics of the insurance contracts. More importantly, the chosen discount rates should be reflective of whether the cash flows vary based on the returns of any financial underlying items.

For cash flows that do not vary based on returns of any financial underlying items, the discount rate may be determined by either a bottom-up approach or a top-down approach. A bottom-up approach may be the total of risk-free rates and corresponding illiquidity premium while a top-down approach may be the expected yield of the chosen assets/reference portfolio net of market and credit risk adjustment.

For cash flows that do vary based on returns of any financial underlying items, the chosen discount rates should reflect that variability. Depending on the nature of the relationship between cash flows and financial underlying items, this may lead to the application of either deterministic or stochastic methods.

3. How it applies to Singapore

Basis of Risk-Free Rates

One of the key components of the bottom-up approach is the risk-free rates. IFRS 17 does not explicitly define the basis for deriving risk-free rates. The two most common options for Singapore are either based on Singapore Government Securities ("SGS") or inter-bank swap rates.

Both options have their respective advantages and disadvantages. SGS, like other sovereign bonds in general, is commonly deemed risk-free due to the nature of a politically stable government and an economically developed country. Meanwhile, swap rates are generally more liquid and are market observable for a greater range of terms than SGS.

For most multi-national life insurance companies, it may be practical to align the IFRS 17 risk free rates to the swap rates for better comparability within the group. For example, swap rates are already in place under Solvency II or Embedded Value reporting purpose. Given that there may be an element of credit default risk being inherent in the swap rates, this may present practical challenges in quantifying the necessary adjustments for such credit risk.

During the review on RBC2[1] by the Monetary Authority of Singapore ("MAS"), similar topics under this subject have been discussed extensively by the life insurance industry. The industry has reached the consensus[2] that the risk-free rate should represent zero-coupon SGS yield, and assumed that other information about Singapore's interest rate environment, such as SGD swap rate, are not admissible. Correspondingly, it may be desirable for the insurers to align both IFRS 17 and statutory basis for management purposes.

However, the industry has highlighted that a limited supply of SGS may lead to an element of illiquidity premium being reflected in the yields, particularly the longer-dated ones. One suggestion was for MAS to secure a supply of longer-dated SGS that is sufficient to meet the projected growth in long-dated insurance liabilities. However, yield distortion will be largely mitigated only if the issuance of longer-dated SGS outpaces the growth of long-dated liabilities. This may present practical challenges in

[1] Response to MAS Consultation Paper, Review on Risk-based Capital Framework for Insurers in Singapore ("RBC2 Review") – Second Consultation, Life Insurance Association of Singapore, June 2014

[2] Follow-up response on Risk Free Discount Rate, Singapore Actuarial Society, March 2015

stripping out such element on yield distortion and supply-side volatility from the market observable yields as compared to swap rates which are generally more liquid.

Extending Yield Curve beyond the last deep and liquid point ("LLP")

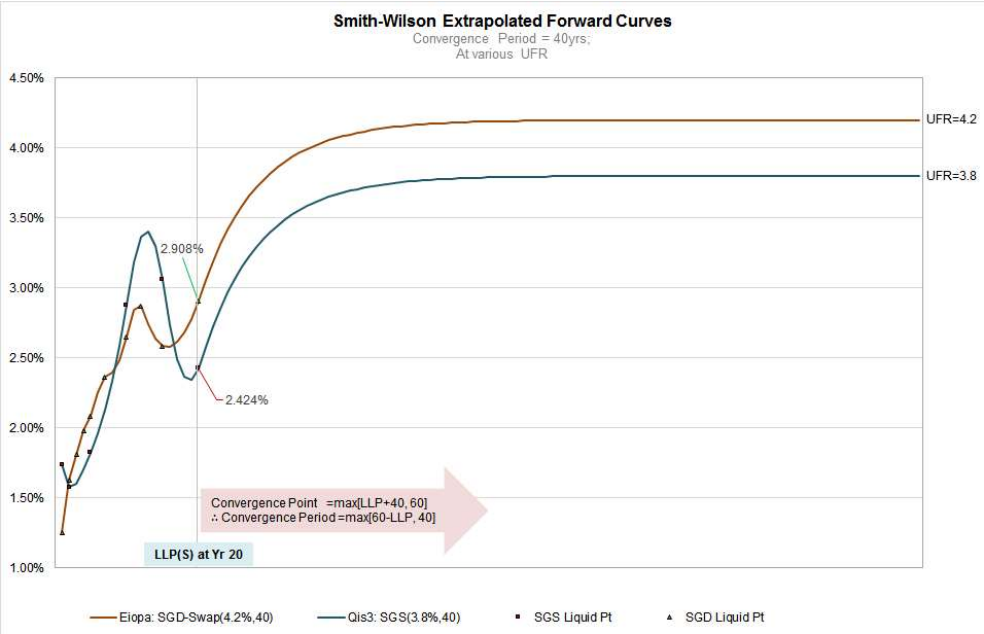
The last deep and liquid point ("LLP") by MAS RBC2 leveraged on the work done by International Association of Insurance Supervisors ("IAIS"). Meanwhile, LLP by EIOPA Solvency II is chosen based on the longest maturity for which risk-free interest rates can be derived from a deep, liquid and transparent ("DLT") market[3].

IFRS 17 requires the discount rates to be consistent with the observable market prices. Given the long-term nature of the insurance contracts, discount rates beyond the LLP may not be directly observable in the market. As such, these discount rates beyond LLP would be estimated based on interpolation or extrapolation techniques. Broadly speaking, two approaches are often considered: (i) extrapolation based on last observable rate; and (ii) extrapolation of the last observable rate to an ultimate rate.

For extrapolation of the last observable rate to an ultimate rate, the choice of the ultimate rate is a significant assumption. If this approach is adopted, there are two reference points on ultimate forward rate ("UFR") that are currently available – (i) 3.8% based on MAS RBC2; and (ii) 4.2% based on EIOPA Solvency II. Both regimes have adopted similar LLP at year 20 and convergence point at year 60 to value SGD-denominated liabilities. Extrapolation between the two points is derived using Smith-Wilson method.

The UFR by MAS RBC2 is also with reference to IAIS, and is determined as the sum of:

- The expected real interest rate (1.8% for development markets and 3.0% for emerging markets based on IAIS' latest public consultation issued on 31 July 2018); and
- The expected inflation rate, which is based on central bank inflation targets.



[3] The technical details of the DLT assessment can be found in Section 4 of the Technical Documentation published by EIPOA: https://eiopa.europa.eu/Publications/Standards/Technical%20Documentation%20%2831%20Jan%202018%29.pdf

Illiquidity Premium

Another key component in determining discount rate under the bottom-up approach is the illiquidity premium. IFRS 17 requires the discount rates to reflect liquidity characteristics of the insurance contracts. Currently, a wide range of methodologies is available to measure the illiquidity premium. These include matching adjustment and illiquidity premium as defined in the latest RBC2 technical specifications issued by MAS, the existing methodology used in respective Embedded Value ("EV") reporting and the Volatility Adjustment available under Solvency II, which is published by EIOPA.

For cash flows that do not vary based on the returns of any financial underlying items, an illiquidity premium as defined in the MAS RBC2 may be practically attractive for the industry in Singapore. This may result in more alignment between statutory capital management and profitability management. Alternatively, an alignment to existing EV or Solvency II may be desirable for most multi-national life insurance companies in Singapore. Such approach may lead to more comparable results between EV/Solvency II and IFRS 17 and thus, more reflective of the respective group's view on the profitability of their businesses.

For cash flows that vary based on the returns of any financial underlying items, an illiquidity premium as defined in the treatment of matching adjustment can serve as reference point.

For any illiquidity premium to be applied, there could be a few ways to accomplish this.

- Adjust the curve at all durations by a fixed amount
- Adjust curve only up to the point of last market observable liquidity differences.

The degree of liquidity characteristics may be wide-ranging for different products. One approach is to quantify the degree of liquidity in specific groups of products and a corresponding illiquidity premium is applied. These broad product groupings would allow the liquidity level estimated from market observable data to be applied to different products with different liquidity characteristics.

Product Group	Liquidity Premium	Considerations
Endowment	Medium	Products with long policy term and sizeable cash value. Short-term single premium tranche products would attract little liquidity premium.
Whole Life	High	Products with long policy term and slower build-up of cash value.
Investment-Linked	Medium	High liquidity premium during the period in which surrender charges are applicable and vice versa.
Universal Life	Medium	Products with long policy term and sizeable cash value.
Term Protection	High	Products with long policy term and generally no surrender charges or cash value.
Integrated Shield Plans	Nil.	Annually renewable products.
Group business	Nil.	Mostly annually renewable products.

Bottom-up and Top-down

Product Group	Considerations	Approach
Participating	Cash flows might vary based on returns of any financial underlying items	Rates that reflect such variability
Investment-Linked	Cash flows do vary linearly based on returns of any financial underlying items	Rates that reflect such variability
Universal Life	Cash flows might vary based on returns of any financial underlying items	Rates that reflect such variability

Other Non-Participating	Cash flows do not vary based on returns of any financial underlying items	Top-down or bottom-up
Integrated Shield Plans	Cash flows do not vary based on returns of any financial underlying items	Top-down or bottom-up

For cash flows that vary based on returns of underlying items, common approaches to derive discount rates based on the returns on the underlying assets. They include strategic asset allocation, or current asset holding; while the returns could be long-term returns, current market yields, or real-world returns.

For cash flows that do not vary based on financial underlying items, either a top-down or bottom-up approach can be considered under IFRS17. The bottom-up approach is recommended because this is in line with the local statutory RBC. Besides, this approach involves less judgement and complications in adjustments while deriving the discount curve than that under top-down approach.

4. Practical Challenges during Transition Period

Availability of Data

- As highlighted during RBC2 review, historical yield data in the SGS website are not zero-coupon yields. It is therefore technically incompatible for use in valuing fulfillment cash flows at specific time points.
- Historical SGS yield could only traced back to start of 21st century for longer dated SGS: 15-year (year 2001), 20-year (year 2007) and 30-year (year 2012).