DAV
Deutsche
Aktuarvereinigung e.V.

Ergebnisbericht des Ausschusses Rechnungslegung und Regulierung

Yield curves in IFRS17

Köln, 27. September 2024

Präambel

Die Arbeitsgruppe *IFRS* des Ausschusses Rechnungslegung und Regulierung der Deutschen Aktuarvereinigung e. V. (DAV) hat den vorliegenden Ergebnisbericht erstellt.[1]

Anwendungsbereich

Der Ergebnisbericht ist an die Mitglieder und Gremien der DAV zur Information über den Stand der Diskussion und die erzielten Erkenntnisse gerichtet und stellt keine berufsständisch legitimierte Position der DAV dar.[2]

Verabschiedung

Dieser Ergebnisbericht ist durch den Ausschuss Rechnungslegung und Regulierung am 27. September 2024 verabschiedet worden.

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[1] Der Ausschuss dankt der Arbeitsgruppe *IFRS* ausdrücklich für die geleistete Arbeit, namentlich Maximilian Börmann (Leitung), Prof. Dr. Claudia Cottin, Stefan Engeländer, Dr. Holger Hebben, Sebastian Kories, Josef Starkmann.

Darüber hinaus gilt der Dank ferner denjenigen, welche zusätzlich an der Ursprungsfassung dieses Ergebnisberichts beteiligt waren, namentlich Dr. Martin Linden, Dr. Peter Ott, Dr. Günter Schwarz.

[2] Die sachgemäße Anwendung des Ergebnisberichts erfordert aktuarielle Fachkenntnisse. Dieser Ergebnisbericht stellt deshalb keinen Ersatz für entsprechende professionelle aktuarielle Dienstleistungen dar. Aktuarielle Entscheidungen mit Auswirkungen auf persönliche Vorsorge und Absicherung, Kapitalanlage oder geschäftliche Aktivitäten sollten ausschließlich auf Basis der Beurteilung durch eine(n) qualifizierte(n) Aktuar DAV/Aktuarin DAV getroffen werden.

Inhaltsverzeichnis

1. Disclaimer

This document is focused on interest rates to be used for IFRS 17 accounting purpose. The reader should observe that supervisory regulation and accounting serve different purposes so that divergent parameters or results between IFRS 17 yield curves and yield curves used in regulatory reporting could occur.

This document focuses on the yield curves to be used for cash flows that do not depend on the returns of any underlying items.

The DAV working group on IFRS 17 decided to prepare relevant IFRS 17 documents in English language. This supports the international character of IFRS 17, as well as comparability within Europe. The actuarial report on interest rates in IFRS 17 is focused on the German market and the actuarial practice in Germany.

2. Introduction

Requirements of IFRS 17 for the yield curve:

The General Measurement Model (GMM) according to the IFRS 17 Standard refers to four components in determining the amount of insurance contract liabilities in accordance with paragraph IFRS 17.32a): in building block I of the general measurement approach, the expected future cash flows are estimated. Building block II discounts these cash flows to derive the time value of money; financial risks are considered. A risk adjustment for non-financial risk (RA) is added in building block III; the RA emerges from uncertainties in the timing and amount of the payments to the policyholder due to non-financial risk. Eventually, building block IV recognizes the amount unearned profit, the contractual service margin CSM.

This document focuses on building block II and the discounting of cash flows, i.e., it focuses on the relevant yield curves. Any adjustments to either the yield curve or the estimate of future cash flows to account for variability of future cash flows with returns of underlying items or financial risk are not in scope of this document.

According to paragraph IFRS 17.36, the discount rates should have the following characteristics:

- Reflection of the time value of money, the characteristics of cash flows and the liquidity of insurance contracts.
- Consistency with prices currently observable on the market for financial instruments if their cash flows have the same characteristics, e.g., in terms of duration, currency and liquidity, as the cash flows of the insurance contracts.
- Independence from factors which, while influencing the observable prices mentioned above, do not influence the corresponding payout patterns of insurance contracts.

In determining the discount yield curve, we must first differentiate whether the contractual cash flows depend on the returns of a pool of underlying items, i.e., are subject to financial risk. If we observe such a dependency IFRS 17.B74 (b) requires that either

- the discount yield curve considers this variability (particularly reflects any financial risks associated with the variability)),

or

- the cash flows are adjusted for this variability and the discount yield curve takes this adjustment into account.

As we have mentioned before we do not further explore any such adjustment to the yield curve in this document.

If the contractual cash flows do not depend on the returns of financial underlying items, i.e., are not subject to financial risk, the IFRS 17 yield curve is derived based on an observable base yield curve, together with an adjustment to account for the differences in liquidity between the assets underlying the base yield curve and the insurance contract (Illiquidity Adjuster IA).

The Standard acknowledges two different approaches:

Bottom-Up Approach, IFRS 17.B80

A base yield curve in the given currency on the basis of the returns on financial instruments, which do not entail a significant credit default risk, and are available for sale at any time without significant cost ("a liquid, risk-fee base yield curve in the given currency), must be adjusted to the effect of the different liquidity characteristics between the underlying financial instruments and the insurance contracts.

Top-Down Approach, IFRS 17.B81

If the base yield curve is calculated on the basis of the market value-based returns of a reference portfolio, this yield curve must be adjusted for the effect of the inherent credit default risk and other market spreads in the fair value returns which are specific only to the asset in the reference portfolio, but not to the underlying insurance contract. An additional adjustment for the effect of the different liquidity characteristics between the financial instruments in the reference portfolio and the insurance contracts is not required.

Each individual reporting entity is responsible for selecting the appropriate reference portfolio(s). There are no restrictions on the composition of the portfolio. However, it is pointed out in paragraph IFRS 17.B85, that fewer adjustments are to be made if the reference portfolio has properties similarly to the characteristics of the insurance contracts.

The IASB is aware (IFRS 17.B84) that the permitted approaches to define the yield curve (top-down or bottom-up approach) may lead to different results. On the one hand, this is due to estimation inaccuracies in determining adjustments related to liquidity or credit default risk, and on the other hand to the fact that the top-down approach **does not require** any adjustment for different liquidity characteristics between the reference portfolio and the insurance contracts.

Note on the use for IFRS 13:

According to IFRS 17.B82, the principles of the Fair Value Hierarchy in line with IFRS 13 must be considered when determining the yield curve on the basis of the fair values of a reference portfolio, i.e.:

- Observable market prices for financial instruments of the reference portfolio must be fully included (Level 1 of the Fair Value Hierarchy).
- If there is no active market for financial instruments of the reference portfolio, the market prices of comparable financial instruments (with adjustments to ensure comparability, if necessary) must be used (Level 2 of the Fair Value Hierarchy).
- If no market exists for financial instruments of the reference portfolio, estimation procedures must be used to determine the fair value of the instrument (Level 3 of the Fair Value Hierarchy).

The guidance in IFRS 17.B82 regarding IFRS 13 applies to the determination of the fair value of assets in the reference portfolio when the yield curve is determined under the top-down approach as described in IFRS 17.B81. The reference to IFRS 13 in IFRS 17.B82 does not apply to any step in determining the yield curve applying any other approach than the top-down approach or how the yield curve is derived from the fair values applying the top-down approach. IFRS 17 requires for determining the yield curve in the bottom-up approach and for deriving the yield curve from the fair value of the assets of a reference portfolio (determined applying IFRS 13) to "maximize the use of observable inputs" and the discount rates "shall not contradict any available and relevant market data" (IFRS 17.B78(a)), considering the definition of "relevant" in IFRS 17.B78 sentence 1.

In accordance with paragraph IFRS 17.B78, no specific techniques are prescribed in estimating IFRS 17 interest rates if no observable market prices or comparable assets exist, but instructions are provided on the type of information to be used:

- Actual, observable and appropriate input factors are to be used as a priority, whereas the use of all non-observable data is to be minimized (reference to IFRS 17.B44).
- Use of all available information – this includes both external and internal information and both market and non-market variables. The discount rate should not contradict any available market data, nor should variables be used that contradict the variables observable on the market.
- The discount rate should reflect current market conditions from the perspective of a market participant. If the respective preparer of IFRS 17 financial statements has relevant fact patterns (e.g., synergy effects) which other market participants do not have, the input factors must be adjusted for these effects.
- Differences in the properties in the insurance contract to the characteristics of financial instruments referred to when deriving discount rates should be considered (reference to IFRS 17.36 (a)-(c)).

3. Methods to deduct a risk-free curve, based on IFRS 17.B79/B84

3.1. Base Risk-free Interest Rate Curve

3.1.1. Liquid Market Interest Rate Curves

To the extent risk free interest rates are observable from market data, IFRS 17 does not prescribe the use of a specific interest rate curve. However, the preparer of IFRS 17 financial statements ensures:

> "The discount rate reflects the yield curve in the appropriate currency for instruments that expose the holder to no or negligible credit risk, adjusted to reflect the liquidity characteristics of the group of insurance contracts." [IFRS 17.B79].

Government bond rates, swaps referencing the 3 M or 6 M EURIBOR) or the euro short-term rate €STR[3] could serve as an appropriate basis for an IFRS 17 risk free basis interest curve. The following aspects are relevant:

- **Government Bond Rates** are far from being uniform in the Eurozone. Differences observed reflect the following:
    - the credit assessment of market participants which need not be fully correlated to risk of a bond default risk over the duration,

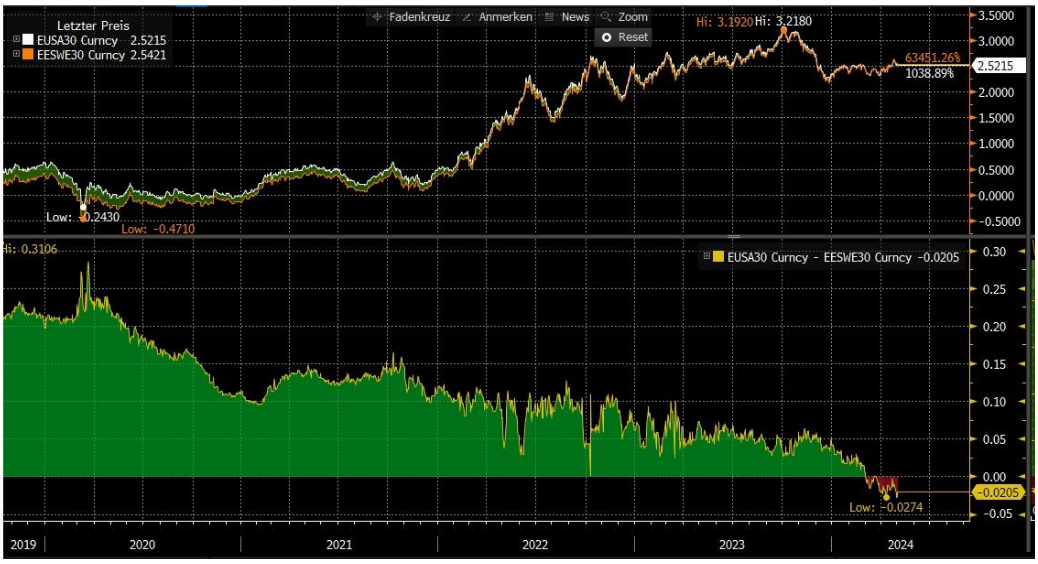
[3]For information on €STR, including the transition from EONIA see e.g. https://www.ecb.europa.eu/stats/financial_markets_and_interest_rates/euro_short-term_rate/html/eurostr_overview.en.html

- any excessive or insufficient supply of government bonds for certain durations, e.g., distortions in the supply of government bonds due to actions taken by the EZB (or other central banks or multinational organisations) on the bond market.

For example: analyses in 2019 showed that at that time some AAA bonds (e.g., German bonds) might have been overpriced due to an excessive demand so that the corresponding interest rates might have been below a “genuine” risk free interest rate. On the other hand, one might consider government bonds with an AA rating (e.g., French or Belgian bonds) still to bear “negligible credit risk”.

An adjustment of government bond rates may be required in those currencies where no government bonds with negligible default risk exist.

- **EURIBOR-Swaps** are generally “liquid” (liquid instrument in a liquid market), but they bear a counterparty risk (e.g., the risk of a short-term default) to a certain extent. Swaps are traded in highly liquid markets and the credit risk is broadly diversified. If swap rates are intended to be used for IFRS 17 discounting the following aspects should be considered:
  - Based on an assessment of a specific financial market at the valuation date we need to analyse whether the inherent (market wide) credit risk for swaps is negligible. For non-distressed markets we consider this the default assumption.
  - For distressed swap markets one might look for alternative instruments (government bonds or overnight index swap rates) which better reflect the requirement of bearing no credit risk.
  - IFRS 17 requires maximizing the use of observable inputs from markets when determining the basis interest rate curve. Therefore, a formula-based correction of swap rates may not be appropriate – at least under non-distressed markets: any formula that aims to provide a correction of any inherent credit risk in the swap rates may not reflect market conditions properly but be rather the outcome of some synthetic assessment.
- **€STR-Swaps** are similarly liquid as swap rates. Due to its collateral structure these rates typically don’t bear any non-negligible credit risk and are typically lower than the swap rates.



Development of the spread between EURIBOR and €STR Swap Rates (Term 30 y) between 2019 and 2024 (Source: Bloomberg)

Remarks:

One might reject the assumption that the observed differences purely reflect the elimination of credit risk, and assume it may also incorporate other pricing elements, e.g., a compensation for the risk of short-term interest rate fluctuations (difference between the 6-month rate). Furthermore, a higher demand for certain types of interest swaps can lead to a distortion.

3.1.2. Conclusion for IFRS 17

Both, the use of government bond rates and swap rates appear to be compliant with the IFRS 17 requirements as a basis for the risk-free interest rate curve.

3.2. Observable Market Data

IFRS 17 requires is to make the best possible use of market information. In the context of interest rates, IFRS 17.B82 refers to the three levels of market data defined originally in IFRS 13 for determining the fair value of assets of a reference portfolio when determining the yield curve by applying the top-down approach in IFRS 17.B81:

Level 1: If there are observable market prices in active markets, an entity shall use those prices.

Level 2: If a market is not active, an entity shall adjust observable market prices of similar assets.

Level 3: If there is no market for assets, an entity shall apply an estimation technique.

In view of Level 1 assumptions for the risk-free interest rate the concept of a “last liquid point” (LLP) may be a meaningful concept for IFRS 17, applying the IFRS 13-concept of input levels for determining fair values to the determination of yield curves applied in the valuation technique required by IFRS 17. In view of an IFRS 17 valuation the LLP should be understood as the maximum duration for which reliable (and non-biased) market information is available to determine the base interest rate.

For durations beyond the LLP an extrapolation method leveraging an estimate for long-term interest rates may be considered. Such an extrapolation may provide an appropriate estimation technique for Level 3 assumptions.

3.2.1. Last Liquid Point

To determine the Last Liquid Point LLP, we refer to a set of criteria for a “Depth, Liquidity, and Transparency (DLT)” assessment which relies on similar analyses that have been done by the European Insurance and Occupational Pension Authority EIOPA in the Solvency II context. For more detail, please refer to [1], Annex C.1.3:

a. Bid-ask spread: the price difference between the highest price a buyer would pay and the lowest price for which a seller would sell;
b. Trade frequency: number of trades that take place within a defined period of time;
c. Trade volume;
d. Trader quotes/dealer surveys (incl. dispersion of answers);
e. Quote counts (1): number of dealer quotes within a window of a few days;
f. Quote counts (2): number of dealers quoting;
g. Number of pricing sources;
h. Assessment of large trades and movement of prices (depth);
i. Only applicable to the Euro: residual volume approach for bonds.

For various purposes EIOPA performs such an analysis on a regular basis[4]. A current analysis at the time of drafting this document led to the following conclusions:

[4] See section 6 of “Technical documentation of the methodology to derive EIOPA’s risk-free interest rate term structures“, December 2023

Table 3 - EEA currencies: instruments and tenors used for the derivation of the basic risk-free interest rate term structures

	EUR	CHF	NOK	PLN	ISK	RON	SEK	CZK	HUF
1Y	S	S		B	B	B		S	B
2Y	S	S	S	B	B	B	S	S	B
3Y	S			B		B	S	S	B
4Y	S			B		B			B
5Y	S	S	S	B		B	S	S	B
6Y	S			B	B	B			B
7Y	S			B		B			B
8Y	S			B	B	B			B
9Y	S			B	B	B			B
10Y	S	S	S	B		B	S	S	B
11Y	S								B
12Y	S								B
13Y									B
14Y									B
15Y	S							S	B
20Y	S								

Remark: The dark-blue cells are the last liquid-points per currency derived from the latest DLT-assessment mentioned above. In addition to that, this assessment gives information about the redemption terms and financial instruments per currency (S = Swap, B = Government Bond) that meet the DLT criteria defined by EIOPA.

3.2.2. Extrapolation to the Ultimate Forward Rate:

For durations beyond the LLP preparers of IFRS 17 financial statements may need to extrapolate the respective risk-free interest rates towards an **Ultimate Forward Rate (UFR)** or apply other appropriate estimation techniques for non-observable interest rates. Such rates should reflect the economically expected value (average over numerous scenarios) of the **short-term interest rate at tenors beyond the LLP**. The purpose of the UFR is to provide a stable, reasonable estimate for long-term interest rates which only changes due to changes in long-term expectations. We consider the following principles in deriving the UFR:

a. The methodology to derive the UFR is clearly specified to ensure the performance of scenario calculations by insurance and reinsurance undertakings.

b. The UFR is determined in a transparent, prudent, reliable, objective manner that is consistent over time.

c. The UFR accounts for expectations of long-term real interest rates and expectations of inflation, provided they can be determined in a reliable manner.

d. The UFR does not include a term premium to reflect the additional risk of holding long-term investments.

After the first step of deriving the UFR, we apply a mathematical extrapolation method to transition from the observable to the non-observable "region", i.e., extrapolating from the LLP to a specified future point in time at which we assume the long-term interest rates to coincide with the UFR. One commonly used method is the Smith-Wilson extrapolation[5]. The most relevant parameters for the

[5]For details see for example Section 9.1 and Annex D.1 of [1]

Smith-Wilson method are the convergence period and convergence speed ("factor alpha"). While these parameters will have to be set individually by preparers of IFRS 17 financial statements, we provide insights into Smith-Wilson extrapolation parameters provided by EIOPA for Solvency II purposes in the appendix.

Calibration of an Ultimate Forward Rate

One possible approach to calibrate the UFR could be based on a **long-term inflation expectation** and an **expectation on the real interest rates**, i.e., on the spread between short-term interest rates and inflation rate. For this purpose, historic data is available over sufficient observation periods (multiple decades) which allows for a reasonable calibration:

- The long-term expected inflation **(EIR)** is calibrated to the central banks' long-term inflation target.
- The expected real interest rate is calibrated at the arithmetic average of observed real interest rates since 1961 **(AIR[6])**. Please note that the actuary may need to adjust the time horizon for real interest rate observations to derive the AIR, e.g., truncate the observation horizon or apply a rolling average. While we acknowledge the stability of methods over time, the actuary will consider the extent to which the current interest rate environment is reflected.

We set:

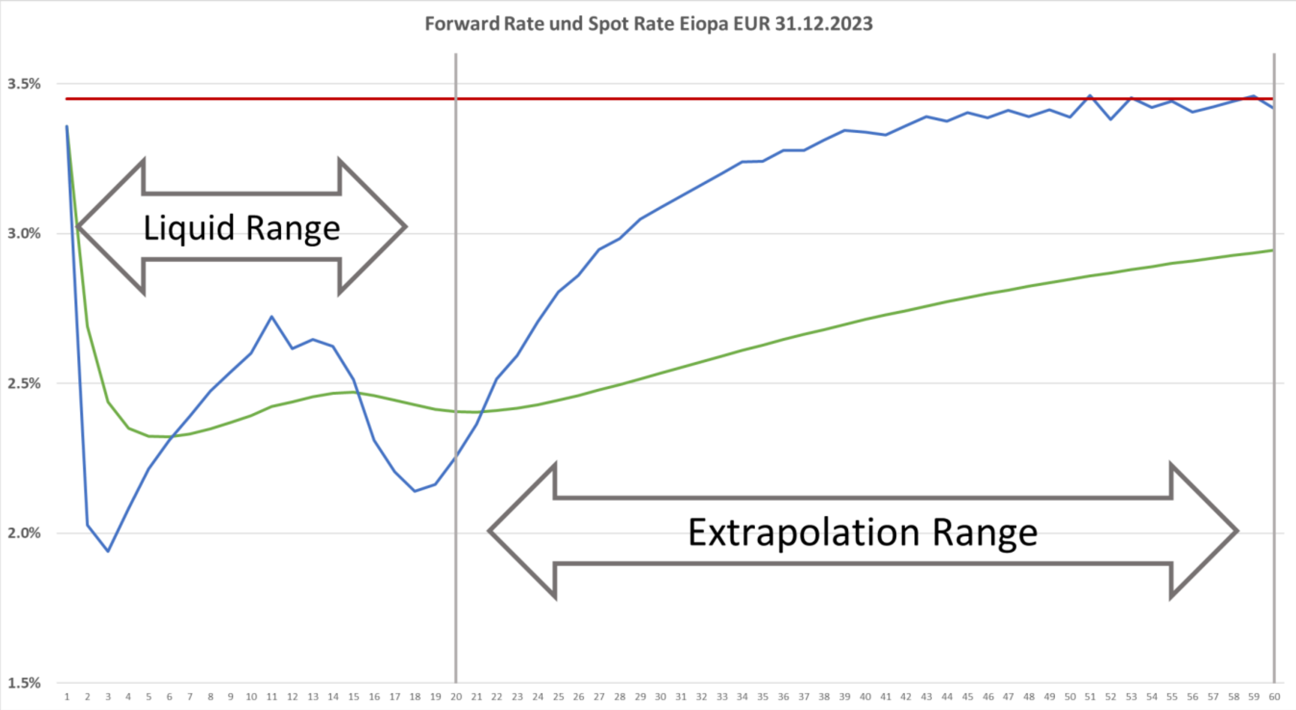
$$\mathbf{UFR = EIR + AIR}$$

Please note that the calibration of the UFR is based on a retrospective assessment of short-term real interest rates and inflation. To which extent adjustments for differences in liquidity characteristic are implicitly reflected in the UFR estimate is subject to judgement. We acknowledge that the resulting measurement of insurance contracts should be appropriate provided the current market environment. For cases where the actuary decides to adjust the UFR for an additional adjustment due to differences in liquidity, a suitable approach may involve a time series of illiquidity spreads between highly illiquid investments and the base risk-free curve at the LLP.

Illustration

Only for the purpose of the following example we use results from Solvency II: we provide an illustration referencing to the EIOPA Solvency II analyses for year-end 2023. We assume an LLP of 20 years, the Smith-Wilson extrapolation method, and a UFR calibrated at 3,45%. The basis risk free interest rate curve is the spot rate in the subsequent diagram:

[6] In certain years, under disturbed market conditions, an AIR, derived for example from government bonds might not be appropriate, due to a shortage of supply or demand. An example is the current buyout of such bonds by the ECB.



- In the liquid range (LLP at 20 years) spot rates (green line) are observed on capital markets
- The spot rate curve is transformed into forward rates (blue line), which is extrapolated by means of the Smith Wilson method. Under the EIOPA calibration the forward rate converges to the UFR over a convergence period of 40 years. One may observe that the convergence effect is concentrated on the first 20 years.
- The resulting (extrapolated) forward rate is transformed back to the spot rate.

3.2.3. Additional Market Data

Although the LLP assessment typically will provide a sufficient condition for the existence of interest rate data that can be considered Level 1 input, it might not be sufficient for IFRS 17: IFRS 17 does not require the existence of quotes and transactions on an active market, nor a sufficient deepness and liquidity of the market. IFRS 17 requires considering any observable market information.

Swap Markets:

Typically swap rates can be read off for terms up to 50 years, both for 6m EURIBOR(EUSWyy) and €STR (EESWEyy). An investigation in March 2024 led to

Term	EUSA BID/ASK in bps	EESWE BID/ASK in bps
10	0,43	0,60
11	2,31	1,12
12	0,67	0,62
13	0,86	0,76
14	0,85	1,18
15	2,18	0,80
16	0,92	1,12

17	0,91	1,22
18	0,91	1,24
19	0,92	1,26
20	1,24	0,83
25	1,22	1,01
30	1,30	0,98
40	1,07	2,32
50	1,18	2,34

(Source: Bloomberg)

In view of liquidity the following observations are of importance:

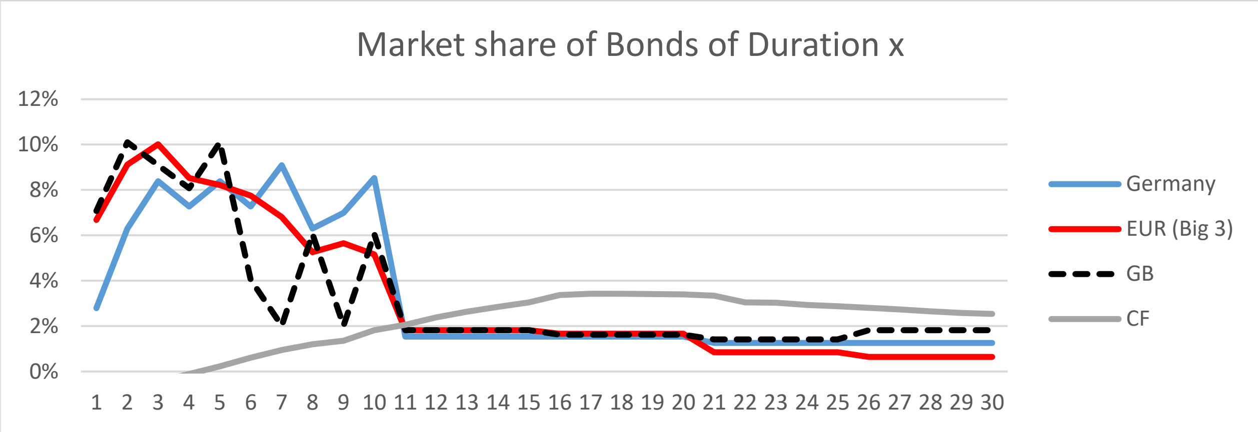
- Widening of the bid-ask spread (difference between payer and receiver price) could indicate for a lack of sufficient liquidity and bias.
- For the EURIBOR there does not seem to be a clear trend or indication for widening or narrowing the bid-ask spread across the accessible term structure. However, for term 20 years and longer there appears to be a slight parallel shift towards a more stable spread above 1 bps.
- For the €STR there seems to be a widening of the bid-ask spread for term beyond 30 years.

Supply of (Government) Bonds:

As discussed above, bond rates might similarly be used for IFRS 17. Apart from using market data purely based on the criteria to be deep, liquid and transparent, another criterion, the "residual volume approach", is applied for the currency Euro in Solvency II. It ensures that the applicable bond market is sufficient for insurance and reinsurance entities to match their respective liability cash-flows. The starting point into extrapolation is chosen with respect to the volume of the available bond markets (i.e., government bonds and corporate bonds) with respect to the liabilities to be covered for the respective maturities. Such an approach reflects the hedging possibilities of the insurer which is relevant from the Solvency II perspective to reflect the realistic ability of the insurer to match the liabilities with assets (a perspective which does not matter under IFRS 17). Market observations farther into the future will become more unreliable. Therefore, extrapolation starts where there is no longer a reliable market for relevant investments for longer maturities, even if a pure analysis of existing market data would indicate a longer LLP.

For IFRS 17, an analysis[7] from early 2018 for some EUR government bonds markets (Germany & cumulated Germany, France, Italy) and UK bonds results in:

[7] Beyond 10 years data only cumulative data is available, e.g., summarized 11-15 years.

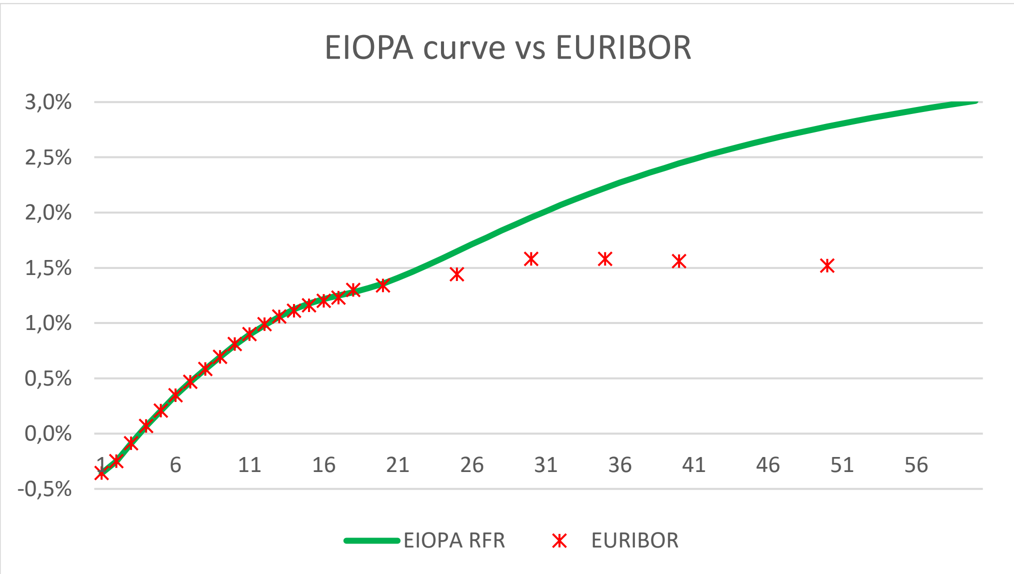


We may take two contradictory conclusions:

- It appears that beyond 10 years there is insufficient supply of investment opportunities compared to expected insurance cash-flows (the green line shows a rough estimate for German insurers).
- If the focus is on the pure existence of a market for such bonds, we observe that German or EURO government bonds are currently available up to a duration of 30 years (some 15% of the overall supply has a duration 11-20 years; some 10% has a duration 21-30 years).

3.2.4. Complementary use of Market Information beyond the Last Liquid Point

For IFRS 17 any approach which utilizes a fixed LLP for the starting point to extrapolation may face the issue that it does not make best use of all available market information. The following graph reflects the situation as of 31.12.2023 (it compares the risk-free EIOPA curve to EURIBOR market data):



Where market data is available beyond the chosen LLP – although on a less deep and liquid market – that information might be considered when assessing the basis risk free interest curve for IFRS 17.

By either extending the extrapolation of the IFRS 17 interest rate curve to a point beyond the chosen LLP, e.g., by assuming an LLP of 30 years or later, or utilizing a linear or spline extrapolation of the Swap Rates, such additional market data can be taken into account. However, the actual issue has not been solved: how to incorporate information form a non-DLT market segment for valuation.

Credibility Weighted Extrapolation as Level 3 Estimation Technique

One possible approach for making use of DLT-market data may be a credibility weighted extrapolation:

- Start with a basic Level 3 estimate method for the interest rate in relevant durations, e.g., with a UFR extrapolated interest rate curve.
- Collect the available market data as long as it is available on a reliable basis and the relevant market is not biased, e.g., make use of EURIBOR rates from observed long duration swap transactions.
- Attribute a certain credibility weight to the additionally observed data in view of their potential relevance for the assessment of the risk-free interest rate and their relevance for setting the discount rate compared to the basic Level 3 estimate.

Based on such an algorithm an extrapolation scheme may be found which gradually satisfies both the DLT-requirement on the use of sufficiently reliable information and the general IFRS demand to make best possible use of market information.

Remark: for non-life valuation purposes, there exist scientific actuarial methods for the calibration of credibility factors based on available information. Actuaries may adopt similar techniques and methods to assign credibility weights to calibrate the IFRS 17 interest rate curve.

Please note that the approach presented here relies on significant actuarial judgement.

Examples:

Company A

Based on an analysis of observable markets the company assesses the market beyond the chosen LLP as not representing sufficiently the perspective of market participants. That company may attribute as an approximation of a very low credibility a **credibility of 0** to any information on interest rates for durations that fail the DLT-test.

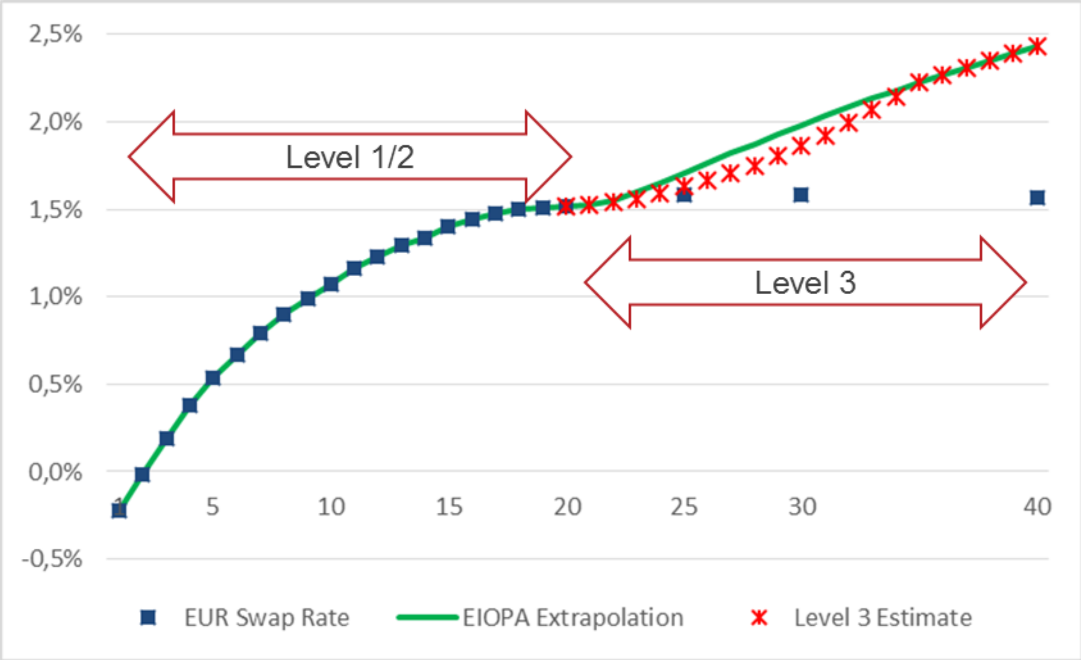
Company A's Level 3 estimation technique would result in an interest rate curve that reflects market observable data until the chosen LLP and extrapolates interest rate data beyond the LLP.

Company B

Based on an analysis of observable markets the company assesses the market beyond the chosen LLP as quite illiquid. The company considers the observable market data on swap rates at durations 20, 25, and 30 years as being relevant with a decreasing credibility. Company B assumes the EIOPA curve at a specific date as its base reference curve. It then allocates the following weights to the available data:

	20	21	22	23	24	25	26	27	28	29	30
20 y Swap Rates	100%	80%	60%	40%	20%	0%	0%	0%	0%	0%	0%
25y Swap Rates	0%	12%	24%	36%	48%	60%	48%	36%	24%	12%	0%
30y Swap Rates	0%	0%	0%	0%	0%	0%	6%	12%	18%	24%	30%
Base Reference Curve (EIOPA)	0%	8%	16%	24%	32%	40%	46%	52%	58%	64%	70%

Company B's Level 3 estimation technique would result in an interest rate curve that converges to the EIOPA for long duration as shown in diagram below:



Company C

Company C reports in Norwegian Krones (NOK). Based on an analysis of observable markets the company assesses that there is no market for NOK interest rates beyond 10 years. However, the company acknowledges that for durations beyond 5 years there is a constant spread between the EURIBOR and swap rates in NOK. For long durations, the company choses to adopt a similar curve as the EIOPA Solvency II approach.

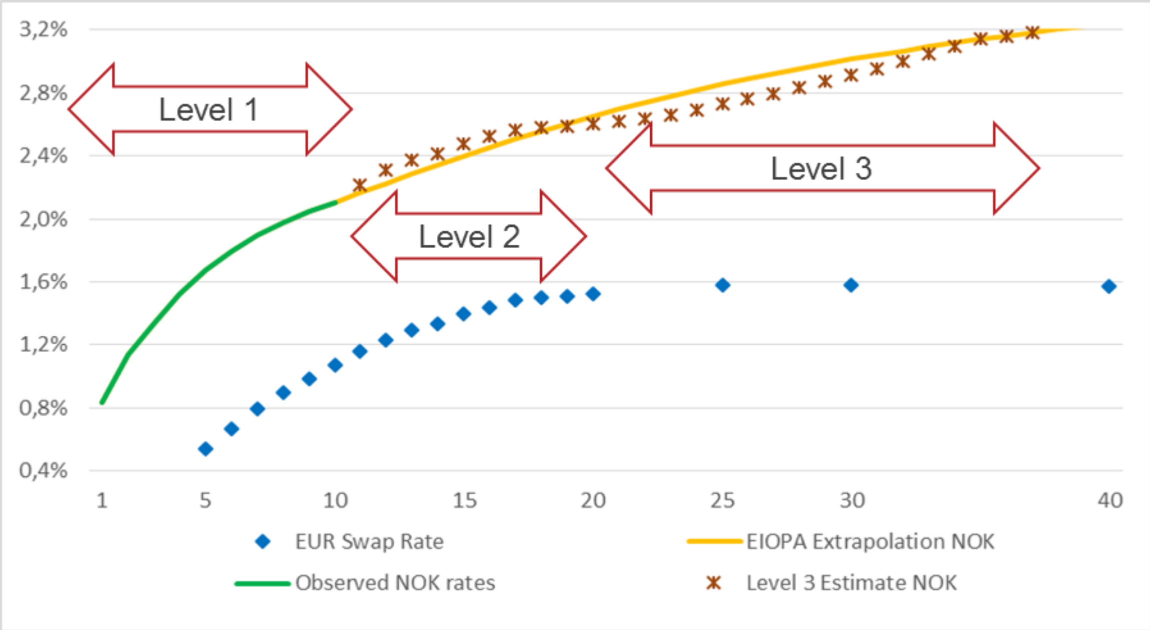
Current market observation for that spread is at 1.06% for durations 5-10 years.

For a level 3 estimation technique the company may use the following credibility model:

- For durations up to 20 years the model attributes a credibility of 100% to interest rate data derived from liquid EUR swap-rates:
    - EUR rates + Current Spread (constant extrapolation of observed data 5-10 years)
- For durations beyond 20 years the credibility of observed EUR swap rates (plus spread) is estimated as follows.

	20	21	22	23	24	25	26	27	28	29	30
EUR 20 y Swap + Spread	100%	80%	60%	40%	20%	0%	0%	0%	0%	0%	0%
EUR 25 y Swap + Spread	0%	12%	24%	36%	48%	60%	48%	36%	24%	12%	0%
EUR 30 y Swap + Spread	0%	0%	0%	0%	0%	0%	6%	12%	18%	24%	30%
EIOPA Curve (NOK)	0%	8%	16%	24%	32%	40%	46%	52%	58%	64%	70%

Company A’s Level 3 estimation technique would result in an interest rate curve that converges to the EIOPA approach for long durations:



For durations up to the chosen Last Liquid Point, there is the reasonable assumption that the respective market information from either swaps or government bonds can "directly" be used to determine the IFRS 17 base risk-free interest rate curve (i.e., such data receives 100% weights).

For certain duration bands **below the LLP the market may fail the DLT test**, but the market is deep and liquid for other durations up until the LLP. In such cases the available market data may be taken as input parameters. This may be the case for Swap Rates beyond 10 years. Here either a linear interpolation or some alternative mathematical technique (e.g., cubic splines) might be appropriate.

For **longer durations** UFR and Smith-Wilson extrapolation methods appear to be a reasonable concept to determine base risk-free interest rates for IFRS 17. Particularly, the methodology[8] for defining the ultimate forward rate and the Smith-Wilson extrapolation method might be useful under IFRS 17 as well. The respective parametrisation (e.g., the convergence speed and the UFR) should always be assessed based on economic considerations rather than using the supervisory calibration[9] without further reflection. Please note that a constant extrapolation might not conflict with IFRS 17.

Using the weighted extrapolation approach may be a reasonable compromise to satisfy to some extent controversial requirements of making best use of existing market data and the reliability of inputs from highly illiquid markets.

[8] It may be relevant to note here that the concrete calibration of the UFR might be biased by political and supervisory aspects. Hence, for IFRS 17 actuaries may need to assess if the calibration of the parameters used for the extrapolation need adjusting.

[9] Although the EIR, based on any central bank assessment, might not be considered market consistent – in view of the political aspects for setting this parameter – it might still be appropriate. Particularly, actuaries need to consider that the central banks' long term inflation expectation – when published – should give rise to measures taken by central banks to reach this inflation target.

4. Illiquidity Adjuster (IA)

4.1. Motivation

IFRS 17 requires the actuary to adjust the base liquid risk-free curve to reflect the difference between the liquidity characteristics of the group of insurance contracts and the liquidity characteristics of the assets used to determine the yield curve.

This may be interpreted as an adjustment to the basic risk-free liquid curve, the illiquidity adjuster (IA). The IA will incorporate the illiquidity of the insurance contract, as well as the additional adjustment to the basic risk-free liquid curve due to the assumed buy & hold strategy of the reporting entity (the reporting entity does not consider selling the acquired insurance contracts in future) in one concise methodological approach.

Please note that IFRS 17 refers to the differences between the liquidity characteristics of the insurance contracts and the investments underlying the discount rates. However,

- Usually there exist no observable market prices for insurance contracts, nor for their respective interest rate spreads with respect to their liquidity.
- Presently there is no generally accepted mathematical model for deriving liquidity of insurance contracts.

4.2. Approach to calculate the IA

To derive an IA a hypothetical "model undertaking" might be assumed which holds investments subject to a buy & hold strategy to match respective pay out patterns of insurance contract.

The actuary may pursue the following strategy in setting the IA:

1.) Observe (or derive) the respective illiquidity spread of investments in a chosen portfolio which matches the illiquidity structure of the insurance contracts reasonably close.

2.) Adjust this spread for a factor which represents the illiquidity of the insurance contracts (refer to IFRS 17.B79).

To derive this "excess" yield earned on the certainty-equivalent risk-adjusted expected cash flows included in the related time value of money, the spread between a portfolio of highly illiquid assets and the liquid risk-free rate is to be calculated.

4.2.1. Notes on a "Hybrid" Approach

For practical considerations, a combination of bottom-up and top-down techniques in the "observable" region may be an appropriate approach to determine the IFRS 17 yield curve for a given currency, particularly to derive a reasonable approximation to estimate the IA. It comprises the following steps:

<u>Leverage bottom techniques to derive the basic, liquid, risk-free yield curve:</u>

1. Choice of a base yield curve based on risk-free financial instruments for a given currency.
2. Definition of a systematic approach to extrapolate the base yield curve to cash-flow durations that exceed the point up to which observable market prices of risk-free financial instruments exists.

<u>Leverage top-down techniques to derive the IA:</u>

3. Selection of a portfolio to assess an illiquidity adjuster as an adjustment of the yield curve representing the value of the uncertainty of timing of cash flows.
4. Estimation of an illiquidity premium for the asset portfolio as the following difference:

    Interest on the portfolio on a market value basis,

    less interest portion for the inherent credit risk, less risk-free base interest rate.

5. Multiplication of the estimated asset illiquidity premium according to step 4 with the share of the contractual cash flows which are considered uncertain in timing.
6. Shift of the base risk-free base curve to derive the illiquid IFRS 17 yield curve to be applied for cash flows where no uncertainty of timing is considered in the yield curve.

4.2.2. Model for calculating the IA:

The actuary could differentiate the IA between different currencies and between insurance contracts which are assumed to have different liquidity characteristics. We suggest applying the IA as a parallel shift to the risk-free liquid base curve for a specified range of maturities (depending on the underlying chosen portfolio). Thus, we will particularly provide a suggestion on how to derive one (average across different tenors) IA based on duration-dependent input parameters.

Given an insurance contract with specific liquidity characteristics, the formula for the IA may have the following form:

$$IA = AP * Spread$$

- *AP* denotes the application ratio reflecting the liquidity characteristics of the insurance contracts.
- *Spread* denotes the spread between two investments which are assumed to provide yields differing only because of different liquidity characteristics.

Precisely, the actuary could pursue the following formula:

$$IA = AP * (RP - rfr - RC)$$

- *AP* denotes the application ratio.
- *(RP – rfr)* denotes the spread between the market rates of return implied in a fair value measurement of a suitable portfolio of highly illiquid assets and the risk-free base curve.
- *RC* denotes the risk correction for credit default of the investments in the illiquid portfolio.

4.2.3. Risk Adjustment for Illiquidity

We have discussed an approach for an IA defined as the product of a contract specific application ratio, and a spread of highly illiquid and fully liquid assets. The question arises to which extent the IA or parts of the IA are to be, or already are reflected in the risk adjustment for non-financial risk. There are two views observed[10]:

1. Policyholder behavior (e.g., lapsing and surrenders) and other consequences from contractual agreements are assumed to be non-financial risk; therefore, to be measured as part of the risk adjustment for non-financial risk ("uncertainty in timing") based on expectations in line with IFRS 17.B62.
2. The uncertainty in timing can be decomposed into two components:
   a) Risk accounted for in the risk adjustment for non-financial risk: because of policyholder behavior or occurrence of the insured event interest is gained for a longer or shorter period of time (compared to what was anticipated).

[10] Note the terminology difference between IFRS 17 referring to liquidity of an insurance contract as the ability of the insurer to transfer the contract (IFRS 17. BC194) and actuarial terminology referring to the uncertainty of timing of the contractual cash flows.

b) Risk accounted for in the IA: because of uncertainty in timing of payments to be made, respective investments are to be liquidated earlier or later than expected when investing the cash inflows matched with the expected cash outflows.

The latter view may be more common and closer to the existing Solvency II framework. To prevent illiquidity of the insurer in the case of a mass surrender event, Solvency II requires to assume that covering assets are invested fully liquid for contracts with unlimited surrender rights. In contrast, preventing illiquidity or bankruptcy is not the purpose of IFRSs. Therefore, risks from policyholders' behavior are measured based on realistic assumptions considering the risk aversion of the entity.

As a result of view 1: the IA is defined based on expected cash flows. One could argue that any deviation of cash flows gives rise to non-financial risk that is to be reflected in the risk adjustment for non-financial risk. Therefore, the application ratio might be chosen differently (in the best case at 100%) if any potential deviation is reflected in that risk adjustment.

In this document we subsequently discuss view 2: we observe that, even though uncertainty of timing of cash flows results from a variation of the timing of contractual cash flows, this risk might not be included in the risk adjustment for non-financial risk: its realization as such does not cause directly a loss for the insurer. Losses may arise only in dependence of the company's asset allocation. Variation of contractual cash flows can result in recognition of losses only if both of the following conditions are met:

- The company's asset allocation is such that certain assets need to be sold excessively of the ALM planning, and
- due to adverse development of capital market parameters or due to the (legal) characteristics of the assets held, such a sale comes along with a loss.

Since both conditions for a potential loss are borne by the company's investment strategy such an illiquidity risk is attributed to the investment side, and hence not covered as part of the risk adjustment in the measurement of the contracts. Any financial impact of variations in the timing of cash flows is borne by an inappropriate asset allocation and hence not attributed to the adjustment for non-financial risk.

4.3. The application ratio AP

The application ratio AP differentiates all cash flows from a group of contracts between

- those which are "sufficiently" certain in timing and could be backed by "completely illiquid investments" without accepting any future liquidity risk,
- and those which are uncertain in timing.

To avoid double counting in the risk adjustment for non-financial risk, the definition of the AP should only refer to the timing, but not the amount of expected future cash-flows. For example, the uncertainty of timing of insurance contracts in traditional German life business are often driven by the uncertainty in policyholder's lapse or surrender behavior[11]. For P&C contracts, e.g. motor contracts, uncertainty of timing usually refers to the uncertainty in the future point in time of pay-out

[11] Insurance contracts regularly cannot be sold by the insurer, and therefore may be considered fully illiquid: the creditor usually does not agree that the debtor transfers its liability to a different entity with possibly worse credit standing. The actuary may assume that from the entity's perspective the application ratio is close to 100% (IFRS 17.BC194). However, we discuss a different view in this document: the entity specific fulfilment cash flows consider policyholder behavior like lapses or surrenders as if they were liquidity characteristics of the contract. Thus, we consider the additional premium in respective assets to account for partial early liquidation of the investment to pay out valid amounts to the creditor.

pattern of claims liabilities. Typically, the timing of payout for a considerable part of the claims liabilities is well predictable but for a remainder of the expected cash flows the timing is less certain.

4.3.1. Example: Life Insurance

Consider a traditional German life insurance contract. The actuary could derive the AP ratio reflecting the uncertainty of timing of the insurance contract using the following algorithm:

1. Split future cash flow from building block 1 of the general measurement model into two components:

$$CF^{Current\ estimate}(t) = \Delta(t) + CF(t)_{fix}$$

   - $CF(t)_{fix}$ denotes the part of the total future cash flows which would remain unchanged under a “reasonable” adverse variation of cash flows due to lapse/surrender and mortality. The idea is to assess the amount of future cash (out-) flows which would be invested in fully illiquid assets without running the risk of a liquidity default in a reasonably adverse scenario. This is the totally illiquid part of the current estimate of future cash flows.
   - $\Delta(t)$ denotes the residual amount to the total future cash flow. This is the liquid part of the current estimate of future cash flows.

2. Compute the present value on a base, liquid risk-free rate which leads to the split

   $PV(CF^{Current\ estimate}(t)) = PV(\Delta(t)) + PV\left(CF(t)_{fix}\right)$ where $PV\left(CF(t)_{fix}\right)$ denotes the totally illiquid part and $PV(\Delta(t))$ denotes the liquid part of the total value reserve.

3. The application ratio AP is set to= $\frac{PV\left(CF(t)_{fix}\right)}{PV\left(CF^{Current\ estimate}(t)\right)}$

4.4. Definition of the illiquidity spread inherent in a portfolio of assets

The actuary may derive this term using the market rates of return implicit in a fair value measurement of the chosen portfolio which is assumed to be less liquid than the risk-free rates:

$$RP - rfr - RC$$

$RP - RC$ denotes the risk-adjusted market rates of return implicit in a fair value measurement of the chosen portfolio and provides the interest rates in a top-down approach according to IFRS 17.B81. The risk-free rates are abbreviated by rfr.:

1. We assume that the risk-free rate is based on highly liquid market instruments. Therefore, the instruments in the chosen portfolio need to be “less” liquid compared to the risk-free rate to adequately reflect the illiquidity.
2. The risk correction RC captures the remaining spread of the chosen portfolio which is not due to illiquidity.

4.4.1. Definition of a portfolio of assets:

The actuary may borrow from the top-down approach in defining conditions on setting the portfolio of assets (IFRS 17.B85):

- “Using debt instruments instead of equity instruments fewer adjustments would be required to eliminate factors that are not relevant to the insurance contracts” (i.e., the risk correction RC)

The portfolio of assets could consist of a reasonable amount of illiquid bonds for every duration. The portfolio of assets used in calculating the IA may be a purely synthetic portfolio of illiquid assets, solely used for estimating a fully illiquid interest rate curve. If the IA shall be applied as a parallel shift for the total coverage period of the insurance contracts to be measured respective illiquid bonds in the portfolio of assets shall have a similar duration in order to properly derive a weighted average parallel shift to the risk-free base curve. Otherwise, suitable long-term estimates for bond returns from the portfolio of assets are required.

One practical example for a portfolio of assets may be given by EIOPA in calculating the SII Volatility Adjustment. However, the EIOPA portfolio of assets for calculating the VA relies on average data across European insurers. Applying a portfolio of assets consisting of more entity specific debt instruments appears more suitable.

4.4.2. Analysis of the illiquidity spread:

In the following the actuary may assume that the portfolio of assets consists of bonds. To define the illiquidity spread the market rates of return inherent in a fair value measurement of the portfolio of assets are to be analyzed. The market return "Y" is given by the coupon payments from the bonds in the portfolio of assets, reduced by market prices valuing the default of the bond. Two (extreme) possibilities for this market return from the portfolio of assets arise:

1.) $Y_1 = Coupon - market\ price\ for\ a\ CDS$, based on the assumption that liquidation of the bonds shall be possible at any time; CDS denotes a credit default swap.
2.) $Y_2 = Coupon - Expected\ Default$; based on the assumption that the entity buys the bonds and holds it until maturity (no permanent liquidation of the bond required)

Both, Y_1 and Y_2 are time-dependent due to the respective duration-dependent parameters.

In a next step the coupon payments from the bonds in the portfolio of assets need to be understood:

$$Coupon = rfr + \rho_D + \gamma(\rho_D) + correction\ term$$

- rfr denotes the risk-free rate.
- $\rho_D + \gamma(\rho_D)$ denotes the risk premium for credit default of the bond. This consists of the expected default ρ_D and the unexpected default / credit migration $\gamma(\rho_D)$
- The correction term includes any further components of the coupon spread which is not due to the risk-free rate or the credit default.

The term $\rho_D + \gamma(\rho_D)$ can be interpreted as the market premium of a counterparty default swap CDS.

This analysis of the coupon payments results in the following values of the market rate of return inherent in the fair value measurement of the portfolio of assets:

- $Y_1 = Coupon - CDS = rfr + corection\ term$
- $Y_2 = Coupon - Expected\ Default = rfr + correction\ term + \gamma(\rho_D)$

We assume that the entity does not require permanent liquidation of the bond in Y_2. Therefore, the actuary could reasonably ignore the extra cost for unexpected default spread / credit migration spread that would be applicable if the respective assets would need liquidated before maturity. Thus, the formula reduces to $Y_2 = rfr + correction\ term$. Note that the assumption that the entity does not require permanent liquidation of the bonds does not impact any accounting practice for entity´s own assets according to IFRS 9.

Eventually the illiquidity spread may be defined as

$$Y_1 - rfr, \text{ or } Y_2 - rfr,$$

depending on whether permanent liquidation of the bonds in the portfolio of assets is required, or not (Y_1 and Y_2 provide a spectrum for possible values of the illiquidity spread).

As a working assumption it is assumed that the IA can be applied as a parallel shift to the risk-free base curve for a specified range of maturities (depending on the duration of the portfolio of assets), instead of a time-dependent adjustment to the base curve. Therefore, a suitable "average" for time dependent components of the IA is to be found: the spreads from the portfolio of assets and the respective risk correction. The formula for the IA will then be evaluated on such averages. One suggestion could be to derive the averages from the time-dependent entries by a weighted average over all future time periods. The weighting itself could be derived by factoring in the run-off of the underlying business:

- Bigger weights are given to time periods with increased amount of claims compared to the total period (based on future cash flows as in building block 1 of the general measurement model)
- Smaller weights are given to time periods with decreased amount of claims compared to the total period (based on future cash flows as in building block 1 of the general measurement model)

The risk correction RC could be understood either as market rates for a CDS (Y_1) or consisting of the expected default (Y_2) only. This provides a spectrum for the possible values of RC. Because a CDS generally only exists for liquid investments, a risk correction consisting of the market value of a CDS could overestimate the RC.

Example:

Assume the (liquid) 10-year risk free rate is 1,2%. Assume further that for a portfolio of highly illiquid bonds (e.g., non-tradable corporate bonds or company loans) of 10-year maturity the following parameters are observed:

- average return 2,2%,
- cumulative annual default rate for bonds in that portfolio according to rating agency assessments 35 bps12,
- market average CDS rate for investment grade corporate bonds – which could be derived from indices like the ITRAX – 82 bps.

Assume an application ratio of AP = 100%. The IA would then be in the range of

65 bps ≥ IA ≥ 18 bps

Lower value attribute only the spread above the risk-free rate plus CDS to the illiquidity. For the upper value, neither risk of market value changes during the holding period are taken into account, nor is there any additional cost of credit risk above the expected default considered.

[12] This figure is reasonable and based on rating-agencies‘ assessments for an investment grade portfolio consisting of 50% „A“ and 50% „BBB“ bonds.

A realistic assessment could be a compromise within the range given. Please note that actuaries may also analyze the extent to which fundamental spreads issued by EIOPA could serve as a model for the risk correction between Y_1 and Y_2.

Conclusion

Neither the illiquidity of assets nor the link between illiquidity rates determined on assets and the adjustments to the time value of money of illiquid insurance cash flows can easily be quantified. The methods described here allow systematically assessing both, in line with the IFRS requirements. Alternative concepts could be compliant with the Standard as well. We think that the concrete calibration of such methods required at least the following considerations:

- The method to separate the illiquid share of the insurance cash flows for a group of contracts. Particularly, if a company decides to follow the methods discussed here, reasonably "adverse scenarios" will have to be further elaborated.
- The calibration of the prices of risk above the expected cost for default in a highly illiquid bond portfolio.

5. Yield curves determined at initial recognition

Whereas for the determination of the fulfilment cash flow under IFRS 17 at a reporting day the current yield curve is relevant, for other elements of the measurement approach also the discount rates at the day of initial recognition of a group of insurance contracts has to be determined. This refers amongst others to the interest accretion and the discount rate for measuring the change of the contractual service margin and the discount rate to be used when applying the premium allocation approach, cf. IFRS 17.B72. For such cases a daily determination of yield curves representing each addition to a group of contracts is not practicable. For such cases IFRS 17.B73 permits, as simplification of representing the composition of the group, the use of weighted-average discount rates.

In order to determine such weighted-average discount rates one might assess the volatility in interest rates over the period contracts of one specific group are assumed and the intensity of new business. In most cases an average based on high frequency assessment of interest rates (e.g. daily or weekly) would not provide relevant additional information unless when averaging over a big number of contracts. In practice a quarterly (or at most monthly) assessment of interest rates might be appropriate. In view of the weights used to determine the average the following aspects may be considered:

- For long duration business with sufficiently continuous new business intensity within a group of contracts an equally weighted average over the relevant interest rate curves should be appropriate.
- If the new business intensity varies substantially due to seasonal effects, either demand driven (e.g., in motor business) or due to specific sales activities the weights might be adjusted appropriately.
- Alternative to this one might consider a "capital-driven" concept. This would be based on the idea, that contracts with inception early in the relevant period cumulate interest over a longer time (in the inception year) than contracts written towards the end of the period. Since the interest rates at the end of a period are relevant for a higher volume than those at the beginning of the period, this might be reflected in the weighted average. This could be relevant for the interest rates chosen for the premium allocation approach. For long-term business, where the weighted-average interest rate determines the CSM effects over a many years, however, such reference to the cumulatively earned interest in the first year might be misleading.

6. Appendix A – Overview over Solvency II

The Solvency II standard in Europe sets clear guidelines regarding discounting (for Details, see [1]). In the following section, we briefly describe the methodology and parameterization of EIOPA Solvency II.

Granularity

Under Solvency II the risk-free yield curve (with and without adjustments) is set per currency and is applied to all insurance and reinsurance obligations within this currency. As the liquidity premium as part of the discounting yield curve is expected to consider currency and liquidity characteristic of the underlying insurance portfolio, different discounting rates based on the underlying insurance portfolio might be applied as well.

Risk-free discount rates and Credit Risk Adjustment

To identify the relevant financial instruments by currency a DLT assessment (deep, liquid, and transparent) has been initially performed by EIOPA in 2016 (and is updated on a yearly basis) to meet the requirements of Article 77a from the Solvency II Directive. In the DLT assessment financial instruments as well as tenors have been defined for each currency (within the Last Liquid Point range). The financial instruments are interest rate swaps, overnight indexed swaps or government bonds, depending on the currency. For Euro interest rate swaps with maturities between 1 and 12 Y, 15 Y and 20Y are considered to meet the DLT criteria.

In addition to that, to determine the insurance liability under Solvency II a correction by the CRA is performed (as long as the risk-free interest rate term structures for a currency are not based on overnight index swap rates). The CRA itself – as discussed above – is not based on a market assessment. It rather is formula based (being constrained between 10 bps and 35 bps) by a decision of the European legislator. Following the EIOPA rules the CRA should reflect only 50% of the difference between Swap Rates and Overnight Index Swap Rates.

Last Liquid Point

Under Solvency II the Last Liquid Point for the currency EUR is calculated using the residual volume criterion (defined in Recital 21 of the Delegated Regulations). For all other currencies the LLP has been chosen as the longest maturity for which risk-free interest rates can be derived from DLT-markets, which is already described in Section 3.2.1.

LLP should be understood as the maximum duration where reliable (and non-biased) market information is available then.

Ultimate Forward Rate

The methodology used by EIOPA to calibrate the UFR is based on a **long-term inflation expectation** and an **expectation on the real interest**, i.e. the spread between short-term interest rates and the inflation rate. For both, historic data is available over sufficient observation periods (multiple decades) which may allow for a reasonable calibration. The EIOPA calibration of the UFR is as follows:

- The long-term expected inflation (**EIR**) is calibrated to the central banks' long term inflation target (currency specific)
- The expected real interest rate is not currency specific and is calibrated to the arithmetic average of observed yearly real interest rates since 1961 (**AIR**), for each year the observed real interest rate is derived as the simple arithmetic mean of the annual real rates of Belgium, Germany, France, Italy, the Netherlands, the United Kingdom, and the United States, (*real rate = (short-term nominal rate – inflation rate) / (1 + inflation rate*, *short-term nominal rate from AMECO Database, inflation Rate from OECD database*).

For Solvency purpose one has

$$UFR = EIR + AIR$$

where some additional stabilisation methods may apply, that limit the SII-UFR de-/increase to 15 bps per period. For Details see [1].

In view of forthcoming discussions, the reader should be aware that the calibration of the UFR is based on a retrospective assessment of short-term items (inflation and short-term real interest rate)

Extrapolation Method

Under Solvency II the Smith-Wilson extrapolation is used for extrapolation from the LLP to the UFR. The most relevant parameters for the Smith-Wilson method are the convergence period and convergence speed ("factor alpha"). The Solvency II setting: the convergence period is set to 40 years and the convergence speed depends on the term structure and UFR. The method for deriving the convergence speed parameter is illustrated in the Excel tool "Smith-Wilson Risk-free Interest Rate Extrapolation" that can be found on EIOPA's website. Please refer to [1], Section 9 for further, technical information on the convergence speed alpha and the convergence period. It needs to be considered, that the Smith-Wilson-Extrapolation method has been part of the Solvency II review and a different extrapolation method will be introduced to grant better market consistency, but the legislative process is still in progress and is not expected to be finished before 2026.

Adjustment to the risk-free yield curve

The Volatility Adjustment (VA) is one additional adjustment to the risk-free yield curve applied in Solvency II. It is defined as 65 % of the risk-corrected spread between the interest rate from a portfolio of assets (average investment among European Insurers predefined by EIOPA) and the basic risk-free rate. Under restrictive condition an insurer might also apply a Matching Adjustment (MA), where the portfolio of assets is its own portfolio.

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