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A change to the Ultimate Forward Rate in June 2017?

Solvency 2

After announcing in October 2015 that the method used to set very long-term rates would be revised, EIOPA has launched a consultation on its proposals.

With a response deadline of 18 July 2016, the consultation includes questions about the various points in the calculation method and a last question on entry into application. EIOPA will give a final opinion on the UFR calculation method in September 2016.

The role of the Ultimate Forward Rate (UFR) in Solvency 2 regulations

Interest rates used to discount insurers' commitments are deducted from the prices of financial instruments traded on the markets, but for very long horizons there is no market deep, liquid, or transparent enough to ascertain the rates' level in any relevant way. For example, for the euro, the **Last Liquid Point** (LLP) was set by EIOPA at the 20-year swap.

For each currency, very long-term rates are extrapolated from

- rates or prices for liquid market instruments whose maturity is less than the LLP (for most currencies, this is the six-month swap against fixed rates);
- an Ultimate Forward Rate (UFR); and
- a point of convergence, where instant rates converge toward the UFR.

The point of convergence is currency-dependent and matches the maximum between 60 years and the LLP + 40 years. For the euro, these two values are identical, and the UFR is positioned on 60 years, but for the pound Sterling, for which the LLP is 50 years, convergence happens at a 90-year horizon.

UFR levels currently used to perform the calculations requested under Pillar 1 were established in 2010 for the fifth Solvency 2 quantitative impact study.

For the euro and most currencies (including the US dollar and the pound), the UFR was set at 4.2% by adding the ECB's target inflation rate equal to 2% and the real rate of 2.2% set by CEIOPS (the entity prior to EIOPA). A UFR of 3.2% was applied for the Swiss franc and the yen, and a UFR of 5.2% was assigned to certain currencies in emerging countries, such as Brazil, Mexico, and South Africa.

UFRs are not fixed by regulations but, on the contrary, can vary "due to changes in long-term expectations.[1]"

The EIOPA's proposal is to amend UFR levels annually.

In order to avoid excessive variations, which would increase volatility in the valuation of liabilities and the solvency ratio, EIOPA plans to limit the range of the yearly change in the UFR to +/- 20 basis points.

EIOPA upholds the principle of defining the UFR for each currency (before the application of the +/- 20 bp limits) starting with the sum of two components:

expected real rate + expected inflation rate

Method for estimating expected real rate

The current method consists of defining the expected real rate component using the average of the historic real rates.

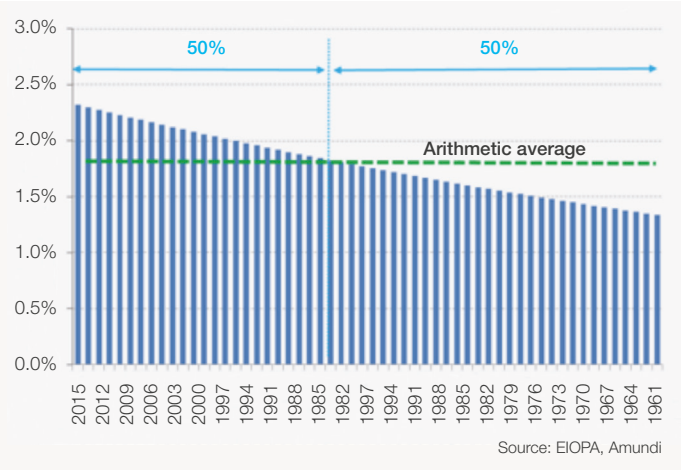
Rather than establish a formula derived from forward rates (considered too volatile), EIOPA's recommendation is to **uphold an approach founded on historic observation, while giving precedence to the most recent observations, by applying an appropriate calculation formula.**

The observation period used for calculating historic annual real rates began in 1960 and is expanded each year when accounting for data from the year just elapsed. EIOPA prefers this process to the application of a fixed term rolling period, which would be vulnerable to the impact of outgoing observations.

Annual real rates are assigned weights based on a geometric series with a control parameter of slightly less than 1. After considering different parameters, EIOPA recommends selecting the one that causes the smallest decrease as anteriority increases. The result is that when calculating the UFR in 2016, the proposed formula assigns a weight that varies between 2.3%, the weight assigned to the most recent observation (2015), and 1.3%, the weight assigned to the oldest observation (in 1960).

1 Article 47 of Commission Delegated Regulation (EU) 2015/35

Weight assigned to the real rate depending on the year



Source: EIOPA, Amundi

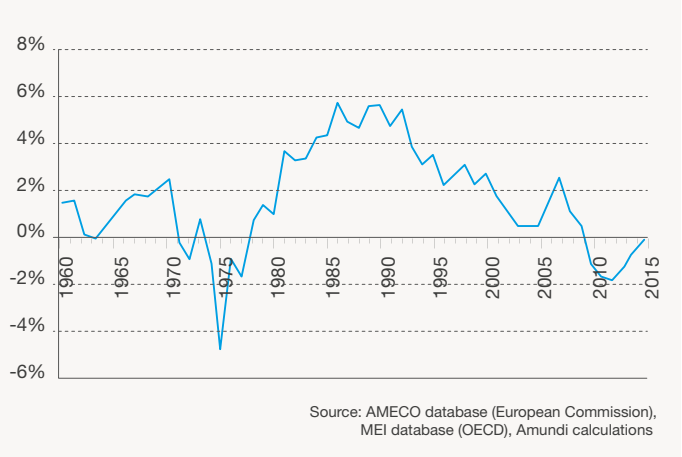
EIOPA recommends keeping a single expected real rate for all currencies.

One of the arguments put forward to reject the alternative, consisting of defining one real rate for each currency, is that there is not enough historical data for many currencies.

However, the set of countries used as a reference for calculating the annual real rate is changing, to the detriment of those countries now outside the eurozone. Twelve countries, only four of which are in the eurozone, were included in the calibration done in 2010. EIOPA proposes restricting the new set to seven countries, with the United States and the United Kingdom still the only two countries outside the eurozone (the eurozone countries being Germany, Belgium, France, Italy, and the Netherlands). Indeed, the data collected during the 2014 preparatory exercise reveals a total insurers exposure of close to 95% on the euro, the GBP, and the USD. EIOPA recommends doing a simple average, without differentiating the weighting of these seven countries, to evaluate each year's real rate.

The choice of databases used to perform calculations according to the new method has also been modified. The European Commission's AMECO database will supply the logs of short rates, and the OECD's MEI (Main Economic Indicators) database will supply inflation logs.

Real rate for the year (average of the five countries used by EIOPA)



Source: AMECO database (European Commission), MEI database (OECD), Amundi calculations

The graph shows that the annual real rate is fairly volatile, but the proposed formula for calculating the expected real rate smooths its changes quite a bit, because it factors in values over 55 years, with weights having the same order of magnitude (between 1.3% and 2.3% for the 2016 calculation).

Ultimately, the expected real rate R is defined by

$$R = \exp\left(\frac{\sum_{k=1960}^{A} 0{,}99^{A-k}.\, ln(1+r_k)}{\sum_{k=1960}^{A} 0{,}99^{A-k}}\right) - 1$$

Where

A = last calendar year elapsed

r_k = annual real rate for year k;

r_k is the equally weighted average of real rates for the seven countries chosen by EIOPA observed for year k (except for 1960, where the universe is limited due to lack of data)

the annual real rate is $\frac{\textit{short rate - inflation rate}}{\textit{(1 + inflation rate)}}$

Next, this is rounded off to obtain a multiple of 5bp, factoring in the prior year's value.

Method for estimating expected inflation rate

Contrary to the real rate component, which is common to all currencies, the expected inflation rate varies by currency.

The current method is to assign a default rate of 2% and, if the inflation rate observed over the last 10 to 15 years is notably lower or higher, a rate of 1% or 3% is applied.

EIOPA's new proposal for defining the expected inflation factor is to authorise four occurrences: 1%, 2%, 3%, or 4%, depending on the target inflation rate of the relevant central bank:

- 1% if the target rate is less than or equal to 1%,
- 2% if the target rate is between 1% (exclusive) and 3% (exclusive),
- 3% if the target rate is between 3% (inclusive) and 4% (exclusive),
- or 4% if the target rate is greater than or equal to 4%.

If the central bank does not state any target inflation rate, historic inflation will be used to choose this factor.

In practice, in the present conditions, application of the new method results in few changes to the inflation component used for calculating the UFR. This factor goes from 3% to 4% only for certain emerging countries' currencies, such as the rand, the real, the yuan, and the Indian rupee.

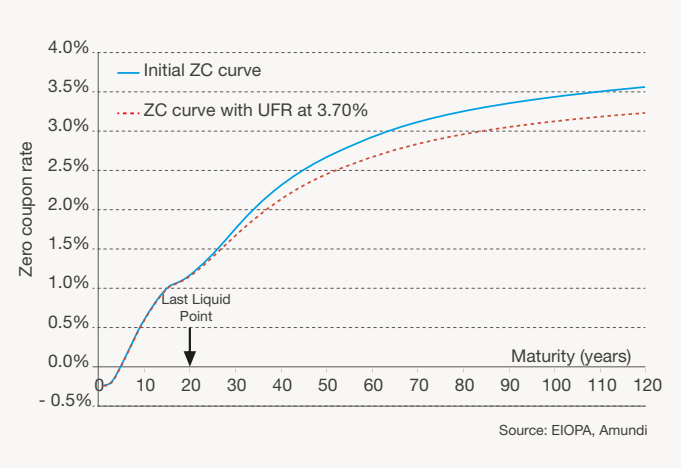
Changes to UFR resulting from application of the new method

With the current short rate and inflation logs, by applying the new method proposed by EIOPA, UFR calculated for the euro (before application of annual variation limits) would be 3.70%.

A decrease from 4.20% to 3.70% would also be applied to the UFR of many currencies: GBP, NOK, USD, CAD, AUD, etc. Conversely, for some emerging countries' currencies, i.e. the real, the rand, the yuan, and the Indian rupee, the UFR would go from 5.20% to 5.70% (a 0.5% decline in the expected real rate component, and a 1.0% increase in the expected inflation component).

The graph below shows the impact of a decrease in the UFR from 4.20% to 3.70% on the euro zero coupon rate curve, in the market conditions at end April. At 30 years, the no-risk rate is down 9 bp; at 40 years, the reduction is 17bp; and at 60 years, it reaches 25 bp (Amundi calculation).

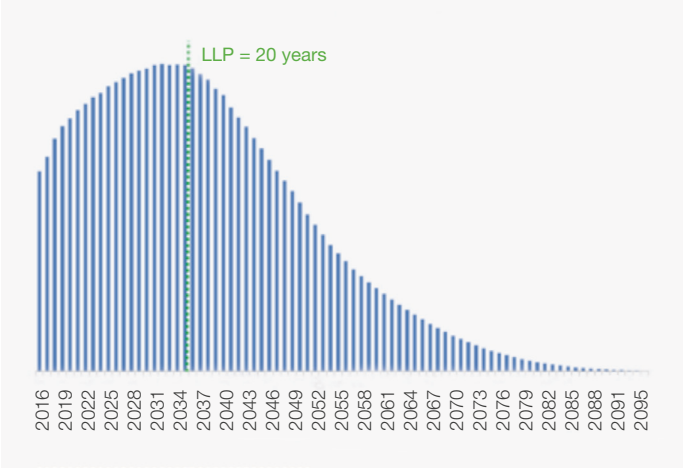
Zero coupon rate curve



Source: EIOPA, Amundi

For the time frame below, assumed in euro, with a duration of 18.1 and with the curve set with a UFR at 4.20%, the current value of flows increases 1.2%, using the curve set with the UFR at 3.70% (with market conditions unchanged). And duration increases to 19.4.

Example of a liability convergence time frame



Conclusion

The new method proposed by EIOPA reuses the major principles used in 2010 to set the UFR, particularly the sum of an expected real rate component, common to all currencies and determined on the basis of historical data and an inflation component, differentiated by currency but still strictly limited.

The recommended formula for determining the expected real rate ensures the longevity of the oldest data and guarantees this component's low volatility.

Thus, if the real rate were stable over a dozen years, the expected real rate would be reduced by about 40 bp, and over 20 years the reduction would be about 60 bp.

Limiting the annual variation to +/- 20 bp means being able to reflect changes in the central banks' target inflation rates over time.

Contacts

Jean-Renaud Viala	Sylvie Nonnon	Insurance Solutions Team
Head of Insurance Solutions	Specialist in Financial Ingineering and Insurance	Insurance Business Line
+33 1 76 32 18 83	+33 1 76 33 93 02	
jean-renaud.viala@amundi.com	sylvie.nonnon@amundi.com	Solvency2@amundi.com

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90 boulevard Pasteur - 75015 Paris France - 437 574 452 RCS Paris www.amundi.com
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