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Insurance Europe comments on:
**Technical Specifications part II on the Long-Term
Guarantee Assessment**
DRAFT v16

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1 Introduction

The trilogue parties – the European Parliament, the Council and the European Commission – have considered that Solvency II should include regulatory measures to deal with the issues associated with insurance products with long-term guarantees that may be affected by what the trilogue parties call “artificial volatility”.

The trilogue parties agreed in July 2012 that the impact of the package of long-term guarantees measures (the LTG package) should be evaluated to assess the effects that implementation of the package will have, in particular

- to assess, first and foremost, the impact of the proposed LTG package on policy holder protection
- to assess whether the proposed LTG package will allow supervisory authorities to supervise insurance and reinsurance undertakings and insurance and reinsurance groups efficiently and effectively
- to assess whether the proposed system can be implemented efficiently and effectively by all insurance and reinsurance undertakings and the cost of implementation
- to assess whether the proposed system provides the right incentives for good risk management and wide risk diversification and contributes to the correct risk reflection of the undertakings
- to assess, in cooperation with ESRB, the impact on financial stability and whether the proposed system has the potential to create systemic risks
- to assess the impact of the proposed LTG package on the single market, including on cross-border business
- to assess the impact of the proposed LTG package on insurance and reinsurance undertakings' solvency position and also possible competition distortions in national markets and the single market
- to assess the impact of the proposed LTG package on long-term investments by insurance and reinsurance undertakings.

EIOPA has been requested to run this technical assessment (referred to as the LTGA in the remainder of this document) that collects both qualitative and quantitative information from insurance and reinsurance undertakings and supervisory authorities on the effects of the LTG package.

The LTGA is designed to evaluate the impact of the following measures individually and in combination:

- Article 77a: Adapted relevant risk-free interest rate term structure (“Counter-cyclical Premium”)
- Article 77b: Extrapolation
- Article 77c: Matching adjustment for certain life insurance obligations (“Classical Matching Adjustment”)
- Article 77e: Matching adjustment for certain insurance obligations not covered by Article 77c (“Extended Matching Adjustment”)
- Article 308b: Transitional measures
- Article 138(4): Extension of recovery period

The LTGA will be based on different sets of input, namely

- Quantitative industry input
- Qualitative industry input
- Qualitative NSA input
- Additional EIOPA analysis

The focus of this document is lining out the specifications linking to the LTG Package and additional technical details for the quantitative industry input. It will also provide details on the qualitative questionnaire where it links to providing data input required for further analysis or validation of the quantitative results. It should be noted that the specifications provided should be understood to supplement the full set of specifications (so called “part I”) already published by EIOPA.

2 Overview to the quantitative assessment

For the purpose of the quantitative industry assessment, participating undertakings are asked to test combinations of the first five measures¹ that are set out in the introduction in 13 scenarios (labelled “0” through “12”) as shown in [Table 1](#).

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Scenario 0 (“Base scenario without LTG Package”):

Participating undertakings should calculate the complete SI and SII balance sheet and solvency positions at the reference date of 31 December 2011. The LTG technical specifications as provided by EIOPA for this assessment should be used to perform the SII calculations. No application of the adapted relevant risk-free interest rate term structure (formerly known as CCP), no matching adjustment and no transitional

¹ The extension of the recovery period is not a measure that will be tested as part of the scenarios within the quantitative industry assessment.

measures to the discount curve are to be assumed. Extrapolation of the discount curves is done based on an approach similar to the one used in QIS5 (see Appendix DC5 for the exact discount curves).

The data to be provided for the scenario include the following: Assets, Technical Provisions, Own Funds (by Tiers), SCR¹ (including results of all sub-modules), SCR Capital Surplus, SCR Ratio, MCR, MCR Capital Surplus and MCR Ratio. Additionally, corresponding SI items need to be reported for the reference date. Similarly, the balance sheet items and capital requirement under SI should be provided as reported at the 31 December 2011.

Scenario 1 (“BASE scenario with LTG Package”):

Participating undertakings should recalculate the SII balance sheet and solvency position at the reference date of 31 December 2011 assuming the standard adaptation to the risk-free rate (i.e. 100 bps) as provided by EIOPA, the classical matching adjustment (77c) based on the standardised approach and the extended matching adjustment (77e) based on the standardised approach as described later in this document. No transitional measures to the discount curve are to be assumed. Extrapolation of the EUR discount curves is done based a last liquid point of 20 years and a convergence speed of 10 years (see Appendix DC5 for the exact discount curves).

The SII balance sheet and solvency position includes the following items: Assets (though unchanged from Scenario 0), Technical Provisions, Own Funds (by Tiers and including Ancillary Own Funds where applicable), SCR¹ (including results of all sub-modules, also including the changes to the CCP and Spread Risk Module), SCR Capital Surplus, SCR Ratio, MCR, MCR Capital Surplus and MCR Ratio. In addition, participating undertakings are asked to provide selected outputs for the case that no CCP would be applied in this scenario.

Scenarios 2-3 (“CCP scenarios”):

Participating undertakings should recalculate affected SII items (versus LTG Base Scenario 1) at the reference date of 31 December 2011 assuming the CCP being at 50 bps respectively 250 bps. (see Appendix DC5 for the exact discount curves)

Affected SII items include all of the ones listed above for Scenario 1.

Scenario 4 (“Narrow MA scenario”):

¹ SCR calculations should be done based on the Standard Formula in the default option. However, the results can be accompanied by Internal Model results where relevant.

Participating undertakings should recalculate affected SII items (versus LTG Base Scenario 1) at the reference date of 31 December 2011 assuming the classic Matching Adjustment (77c) being applied in an alternative version.

Affected SII items include all of the ones listed above for Scenario 1.

In addition, participating undertakings are asked to provide selected outputs for the case that no CCP would be applied in this scenario.

Scenario 5 (“Extrapolation scenario”):

Participating undertakings should recalculate affected SII items (versus Scenario 1) at the reference date of 31 December 2011 assuming the applied interest rates reflect the extrapolation method using 40 years rather than 10 year convergence speed for the EUR (see Appendix DC5 for the exact discount curves).

Affected SII items include all of the ones listed above for Scenario 1.

In addition, participating undertakings are asked to provide selected outputs for the case that no CCP would be applied in this scenario.

Scenarios 6-7 (“Extended MA scenarios”):

Participating undertakings should recalculate affected SII items (versus Base Scenario 1) at the reference date of 31 December 2011 assuming the versions Standard II and Alternative of the extended MA application ratio. Further instructions on the applications of MA are provided in section 3.

Affected SII items include all of the ones listed above for Scenario 1.

In addition, participating undertakings are asked to provide selected outputs for the case that no CCP would be applied in scenario 6.

Scenarios 8-9 (“Transitional scenarios”):

Participating undertakings should recalculate the affected SII items at the reference date of 31 December 2011 assuming the transitional measure applies to all existing business respectively to paid-in premiums only. For this technical assessment it is assumed that the transitional measure is at 0 years into the process, i.e. the full Solvency I curve is applied.

Affected SII balance sheet items include all of the ones listed above for Scenario 1.

Scenarios 10 (“YE09 scenario”):

Comment [ECO1]: We note that this scenario is required by the ToR.

However we would like to highlight that splitting individual contracts and applying different discount rates to different cash flows of the same contract is currently not possible in many insurers' models. Consequently it will be hard for companies to produce reliable figures.

Finally, we would like to reiterate that we do not see any economic reason for limiting the transitional to the paid-in part of a contract.

Comment [ECO2]: We would welcome clarification on how the impact to later years (beyond year 0) will be estimated. In particular, it is not clear if this transitional will also apply to contracts sold after the entry into force of Solvency II – if this is not the case then this needs to be taken into account in the analysis of the results.

Participating undertakings should recalculate the complete SII items at the reference date of 31 December 2009 in line with Base Scenario 1. Undertakings should thereby use the YE11 liability and asset portfolios, only applying the relevant adjustments to yield curves/ market prices as provided by EIOPA. A separate supporting paper describes a proposed simplification on how to value assets and future discretionary benefits at historic reference dates.

The complete SII items include the ones listed for Scenario 1.

Scenarios 11-12 (“YE04 scenarios”):

Regarding scenario 12, participating undertakings should recalculate the complete SII items at the reference date of 31 December 2004 in line with Base Scenario 1 – however, CCP does not apply given the relatively “normal” financial market conditions in 2004. Scenario 11 varies from scenario 12 to the extent that instead of the extended MA, the transitional measure is applied assuming to be 0 years into the transition process. Undertakings should thereby for both scenarios use the YE11 liability and asset portfolios, only applying the relevant adjustments to yield curves/ market prices as provided by EIOPA. A separate supporting paper describes a proposed simplification on how to value assets and future discretionary benefits at historic reference dates.

The complete SII items include the ones listed for Scenario 1.

In providing quantitative data, insurance and reinsurance should follow the technical specifications for the LTGA laid out in this document.

		Scenarios at the reference date YE11										Scenarios at historic reference dates		
		0	1 BASE	2	3	4	5	6	7	8	9	10	11	12
I	Adapted relevant risk-free interest rate term structure (CCP)													
A	No CCP	x											x	x
B	CCP of 100bps		x			x	x	x	x	x	x	x		
C	CCP of 50bps			x										
D	CCP of 250 bps				x									
II	Extrapolation													
A	In line with QIS5	x												
B	LLP 20yrs for EUR, 40 yr convergence						x							
C	LLP 20yrs for EUR, 10 yr convergence		x	x	x	x		x	x	x	x	x	x	x
III	Classical Matching adjustment (77c)													
A	No Matching Adjustment	x												
B	77c Standard version		x	x	x		x	x	x	x	x	x	x	x
C	77c Alternative version					x								
IV	Extended Matching adjustment (77e)													
A	No Matching Adjustment	x								x	x		x	
B	77e Standard I version		x	x	x	x	x					x		x
C	77e Standard II version								x					
D	77e Alternative version						x							
V	Transitional Measures													
A	No transitional measure	x	x	x	x	x	x	x	x			x		x
B	Transitional measure applied to all existing business									x			x	
C	Transitional measure applied to paid in premiums only										x			
VI	Reference date													
A	31 December 2011 (YE11)	x	x	x	x	x	x	x	x	x	x			
B	31 December 2009 (YE09)											x		
C	31 December 2004 (YE04)												x	x

Comment [ECO3]: On page 4 and page 5, both scenario 0 and scenario 1 are named Base-scenario. This table only refers to scenario 1 as BASE scenario. Since we don't see any reason for scenario 0 at all we would welcome a situation where only scenario 1 is seen as a Base-scenario – however it should be consistent throughout the document.

Table 1: Overview of scenarios tested in the qualitative assessment (deviations from BASE marked in grey)

3 Determination of the risk-free interest rate term structure

3.1 Introduction

For the different scenarios 0-12 described before, the risk-free interest rate term structures or discount curves applied to different parts of the liabilities vary. For the purpose of this assessment, EIOPA provides all major discount curves for the different reference dates and scenarios, apart from the ones using a matching adjustment or a transitional measure as both of these are company specific.

This section provides insights on

- how the basic risk-free term structures have been derived by EIOPA (subsections 3.2 and 3.3)
- how the CCP adjusted basic risk-free term structures as provided by EIOPA have been derived and are to be applied (subsection 3.4)
- how the transitional term structures are to be derived and applied (subsection 3.5)
- how the matching adjustment is to be applied (subsection 3.6, details on the determination of the matching adjustment are provided in section 4).

Regarding the application of the discount curves (including the ones provided as well as the ones taking into account the transitional measure or the matching adjustment), the same curve should be used for discounting as well as projecting liabilities (relevant for profit sharing business).

3.2 Methodology for determining the basic risk-free interest rate term structures provided by EIOPA

3.2.1 Selection of data and determination of entry point to extrapolation

To determine the basic risk-free term structure, considerations have to be made in respect of the availability and the relevance of data. In addition, those data have to be adjusted for the inherent credit risk or take into account the peg to another lead currency, if applicable.

3.2.1.1 Choice of reference instruments

For the purpose of the LTG assessment, as regards the availability of swaps and government bonds for each currency we refer to the analysis performed by EIOPA that is

presented on pages 66-67 in the EIOPA issues paper for pre-consultation on the determination of the risk free interest rate term structure³, published 13 March 2012.

As regards quotes for swap data, the swap mid rate will be used in the determination of the basic risk-free interest rate term structure.

3.2.1.2 Assessment of ADLT criteria and determination of the LLP

For the purpose of the LTG assessment the reference instruments and values for the LLPs shown in Appendix DC1 were selected. These instruments and values are the same ones that were used in QIS5 except for the following cases:

- The Euro, where a LLP of 20 years was selected.
- The Polish Zloty, where swap rates were used for maturities 1-5 years, government bond rates were used for maturities 6-10 years, and a LLP of 10 years was selected.

3.2.2 Treatment of data and adjustment for credit risk

The reference instruments used to derive the basic risk-free interest rate term structure need to be adjusted for credit risk, and in the case of interest rate swaps also for basis risk.

3.2.2.1 Adjustment of credit and basis risk for interest rate swaps

For the purpose of the LTG assessment, the adjustment for credit and basis risk is applied as a fixed deduction across all maturities of the observed swap term structure. Acknowledging that the methodology for the determination of this adjustment is still under development as regards the final Solvency II formulation, for the purpose of the Impact Assessment the same adjustment is applied to all currencies.⁴

In particular, the adjustment takes into account the risk that is embedded in the determination of the floating rate leg of the swap deal, i.e. the risk pertaining to uncollateralised interbank market. Thus, the credit risk adjustment depends on the credit quality of the banks that, via interbank transactions, determine the basis for the floating leg in swap contracts. See Appendix 3 for further details.

³³ EIOPA-FinReq-12-06 *Determination of the risk free interest rate term structure for Solvency II*, 13 March 2012.

⁴ The adjustment mainly depends on the credit quality of the banks that, via interbank transactions, determine the basis for the floating leg in swap contracts. For this reason, it is possible that the credit risk adjustment will vary by currency area/country, and it will certainly depend on the state of the business cycle, and the general risk perception in the economy and banking industry. However, for the purpose of the LTGA the same adjustment will be applied to all currencies. See further Appendix 3 for background material on the credit risk adjustment.

Comment [ECO4]: A 35bps credit risk deduction for year-end 2011 appears extremely prudent and does not appear to have a robust derivation.

For instance, the method adopted (we understand it to be based on the difference between 3 month swap rates and overnight rates) could include a significant component of illiquidity “masquerading” as credit risk (e.g. the YE08 figure was 50bps much of which is likely to have been illiquidity impacting the difference between 3 month and overnight rates, rather than credit risk).

The calibrations also include additional and arbitrary elements of prudence (rounding up of GBP value to Euro and rounding up to next 5bps).

Additionally, for year-end 2009, the credit risk adjustment has increased from 10bps (as in QIS5) to 20bps (as in Appendix DC1) without explanation.

We believe that more work should be done in this area during/after the assessment to find a technically robust solution.

The adjustment that mainly reflects the credit risk inherited in swap rates changes over time and is therefore estimated separately for each reference date of the LTG impact assessment.

3.2.2.2 Adjustment of credit risk for government bonds

The vast majority of risk free term structures to be derived for the LTGA are based on swap rates. And, being conscious of the fact that a framework for the credit risk adjustment for government bonds currently is under development, it is proposed for the current assessment not to implement a credit risk adjustment for government bonds that deviate from the one applied to swaps.

3.2.2.3 Treatment of currencies pegged to the euro

For currencies pegged to the Euro, the basic risk-free interest rate term structure for the Euro, subject to an adjustment, may be used to calculate the best estimate with respect to insurance and reinsurance obligations denoted in that currency, provided the conditions laid out in Article 40bis IR5bis of the Draft Delegated Acts are met.

The exact approach to calculation of the adjustment is however not yet fully decided.

For the purpose of the LTG assessment the following approach is taken as regards currencies pegged to the Euro:

- The Danish Krone (DKK) is deemed to meet the conditions of Article 40bis IR5bis. The adjustment, however calculated, is deemed to be very small and for practical reasons set to zero.
- The Latvian Lats (LVL) is for practical reason and in the interest of time *assumed* to meet the conditions of Article 40bis IR5bis. For the same reasons, it is *assumed* that the adjustment is zero.
- The Lithuanian Litas (LTL) is for practical reason and in the interest of time *assumed* to meet the conditions of Article 40bis IR5bis. For the same reasons, it is *assumed* that the adjustment is zero.
- The Bulgarian Lev (BGN) is deemed not to meet the conditions of Article 40bis IR5bis.

In practice therefore, for the purpose of the LTG assessment, the best estimate of insurance or reinsurance obligations denoted in DKK, LVL or LTL may be calculated using the basic risk-free interest rate term structure for the Euro without an adjustment.

Comment [EC05]: The use of the word „may“ implies that another term structure (which would include an adjustment) can be used on an optional basis. Is this understanding correct?

3.3 Methodology for extrapolation and interpolation of the basic risk-free interest rate term structures provided by EIOPA

The appropriate risk-free interest rate term structure will in practice be constructed from a finite number of liquid market data points. Therefore, both interpolation between these data points and extrapolation beyond the last liquid point (LLP) are required.

3.3.1 Methodology

The interpolation between data points and extrapolation beyond the LLP will be done using the Smith-Wilson method as proposed by EIOPA in their issues paper for pre-consultation on 13 March 2012.

3.3.2 Parameterisation

3.3.2.1 The ultimate forward rate (UFR)

The ultimate forward rate (UFR) is the percentage rate that the forward curve converges to at the pre-specified maturity. The UFR is a function of long-term expectations to the inflation rate, and to the long-term average of the short-term real rate. As this value is assessed in line with long-term economic expectations it is expected to be stable over time and only change due to changes in long-term expectations.

For the purpose of the LTGA it is assumed that the UFR for each currency is based only on the estimate of the expected inflation and the estimate of the long-term average of the short-term real rate.

For pragmatic reasons, since it is very difficult to differentiate between long-term economic expectations of different currency areas in a globalized economy, for the purpose of the LTGA it is assumed that the UFR for each currency is equal to 4.2% (i.e. 2.2% long term growth rate and 2% inflation rate assumption).

The choice of the last liquid point (LLP) on the observed swap data term structure, for each currency, is based on the principles derived in the QIS5 exercise. Thus, the LLP represents the swap contract with the longest maturity that is actively traded, i.e. where sufficient supply and demand exist. For this reason, the LLP varies by currency area.

3.3.2.2 The speed of convergence to the UFR

The alpha parameter in the Smith-Wilson method determines both the speed of convergence to the UFR in the extrapolated part, and the smoothness of the curve in the interpolated part. Larger values of alpha give greater weight to the UFR, while smaller values of alpha give more weight to the liquid market data.

Comment [ECO6]: Applying the same UFR across all currencies is not realistic, even in a globalised economy, as long-term expectations (eg on growth rates and inflation) are not the same for all currencies. As an example, the inflation target in Norway is 2.5% while it is 2% in the euro zone.

Rather than applying the same rate for all currencies, it would be more appropriate to apply the same formula based on the macroeconomic components driving the UFR.

For the purpose of this impact assessment, at least the inflation component should be differentiated by currency.

Comment [ECO7]: It is stated that the choice of the last liquid point is “based on the principles derived in the QIS5 exercise”. This seems inappropriate since in the meantime there was an agreed new version for the level 2 delegated acts which refer to criteria for “the markets for the relevant financial instruments from which the risk-free rates are derived or [...] markets for bonds in that currency” (Art. 39 IR4 (1)) and the possibility for “undertakings to match with bonds the cash-flows which are discounted with non-extrapolated rates in the calculation of the best estimate” (recital 20). We strongly recommend including these parts in paragraph 3.3.2.1.

For the purpose of the LTGA, the alpha parameter is calibrated so that the extrapolated part of the forward curve converges to within 3 bps from the UFR at a specified number of years from the LLP. Three different assumptions are tested:

- Convergence in 10 years from the LLP,
- Convergence in 40 years from the LLP, and
- Convergence in 90 years from the reference date (i.e. in 90 minus LLP years from the LLP).

Comment [EC08]: We recommend including the concrete choice of parameter alpha for the various convergence scenarios

Comment [EC09]: Our understanding of the ToR (see table 2 page 16) is that extrapolation with an LLP of 30yrs for EUR and 40yr convergence should be tested.

3.4 Determination of adjustments to the basic risk-free interest rate term structure provided by EIOPA (CCP)

Comment [EC010]: No details regarding the introduction of a national CCPs and the sensitivity testing of the CCP shock are provided. We would welcome to have more insights on the planned analysis.

3.4.1 CCP testing approach for the LTGA

Given the political sensitivity of the topic and the currently insufficient data situation to determine the “real” yield curve adjustments (aka CCP), the approach chosen for the impact assessment is to test three default levels of CCP in the scenarios (50 bps, 100 bps, 250 bps). The impact of actual CCP values linking to the respective reference date, currency or country is then determined in an add-on analysis by EIOPA in a later stage of the assessment.

3.4.2 Determination of the adjusted risk-free interest rate term structure

For the purpose of this assessment, EIOPA has provided the CCP-adjusted curves for major currencies. Respective curves were determined as follows:

- Swap rates (used as basis for calculation of the risk-free rate until the LLP) are corrected for credit and basis risk as described earlier
- The CPP adjustment is added to the zero swap rates
- The resulting rates are the input to the Smith-Wilson model outputting the zero curves

Comment [EC011]: We suggest clarifying the definition of swap rates (“zero swap rates”).

Because CCP is applied to swap rates, final CCP-adjusted discount curves provided by EIOPA do not show a parallel shift until the LLP.

Comment [EC012]: We note that there is no parallel shift after LLP either (since the interest rates converge to the same UFR in all cases).

3.4.3 Interaction with the standard formula

Following the draft implementing measures, the capital requirement for counter-cyclical premium risk shall be equal to the loss in the basic own funds that would result from an instantaneous decrease of 100% of the counter-cyclical premiums.

Companies using internal models and applying CCP for all or parts of their portfolio need to reflect the risk in their capital requirements calculations that 100% of the CCP impact is lost instantaneously.

3.5 Transitional measure

A transitional measure on the discount curve is proposed with the aim to introduce the full effect of Solvency II only gradually over a sufficiently long time-period. In practise this means that undertakings would value according to Solvency II principles, however assuming that an average of Solvency II and Solvency I interest rates is used for valuing existing liabilities, where the Solvency I interest rate is fixed at the date of implementation of the LTG package. In effect, the transitional measure applies to recognized insurance obligations at date of application.

3.5.1 Scope of transitional measure

Notwithstanding Articles 76 (2), 76 (3) and 76 (5), the rates of the relevant risk-free interest rate term structure to calculate the best estimate with respect to insurance or reinsurance obligations for contracts, excluding renewals,

- (a) for which, according to the laws, regulations and administrative provisions adopted pursuant to Directive 2002/83/EC, technical provisions were determined using the interest rate referred to in the laws, regulations and administrative provisions adopted pursuant to Article 20.B.a of that Directive; and,
- (b) where the insurance or reinsurance undertaking complies with the laws, regulations and administrative provisions for the establishment of technical provisions which are adopted pursuant to Article 20 of Directive 2002/83/EC, Article 15 of Directive 73/239/EEC and Article 32 of Directive 2005/68/EC,

may be calculated as set out in the following paragraph.

3.5.2 Construction of the transitional discount curve

For each currency and in respect of each maturity the transitional discount rate is to be calculated as the weighted average of the following two elements:

- Solvency II rate as provided by EIOPA: The rate for that maturity of the relevant risk-free interest rate term structure as measured in accordance with Article 76 (2), Article 76 (3) and Article 76 (5). In case of a countercyclical adjustment being applied to that relevant risk-free interest rate term structure (in accordance with Article 77a) this should be taken into account

Comment [EC013]: It is unclear whether transitionals must be applied by all companies or if it is optional.

Note that we believe the application of this transitional should be optional once Solvency II is in force.

- Solvency I rate: The interest rate referred to in the laws, regulations and administrative provisions adopted pursuant to Article 20.B.a of Directive 2002/83/EC

Where member states have adopted laws, regulations and administrative provisions pursuant to Article 20.B.a.ii of Directive 2002/83/EC, the interest rate referred to in the second bullet point shall be determined using the methods used by the insurance or reinsurance undertaking taking into account information that is current each time that determination is made.

The transitional measure on the discount curve has the aim to introduce the full effect of Solvency II only gradually over a time-period of 7 years.

General conditions to be met if the transitional measure is applied:

- The transitional measure can only be applied to obligations resulting from activities within the member state where the insurance or reinsurance undertaking is authorised
- The transitional measure only applies to existing contracts at date of application
- The transitional measure applies to all eligible insurance obligations of the undertaking, i.e. there is no free choice to apply the measure only to a subset of those obligations
- Neither the Classical Matching Adjustment (Article 77c) nor the Extended Matching Adjustment (77e) can be applied to the same obligations

If the Solvency I rate varies for different obligations, the transitional measure is to be determined separately for each bucket of obligations. To facilitate the calculations, appropriate simplifications to the calculations can be considered. Where there is different interest rate guarantees offered by an insurance undertaking it may be very burdensome to apply different interest rate curves for the determination of technical provisions. It could therefore be considered to apply an average interest rate where the average takes into account the share of liabilities with different guarantee levels on the whole insurance portfolio. The calculation of the average should however consider that the shares of liabilities with different guarantee levels can vary over time. Any simplification will

require the participating undertaking to provide information needed to validate the appropriateness of the calculation.

The respective weights for all maturity points are to be determined according to the following table:

Years into the	Weight of SII rate	Weight of SI rate
0	0 %	100%
1	14 %	86 %
2	29 %	71 %
3	43 %	57 %
4	57 %	43 %
5	71 %	29 %
6	86 %	14 %
7	100%	0 %

3.5.3 Application of the transitional measure

- The transitional measure is to be used to calculate technical provisions for the Solvency II balance sheet.
- For the purpose of determining the SCR (e.g. 1-in-200 stress on the interest rates), the stresses of the interest rate risk sub-module are applied to the whole relevant risk free interest rate term structure (including the part of the Solvency I rate).
- In case of a CCP application in conjunction with the transitional yield curve, the CCP is only to be applied to the Solvency II part of the curve, i.e. in the context of this assessment (assuming year 0 into the transition meaning 0% weight for the Solvency II curve) the transitional curve will not contain any CCP adjustment.

Comment [ECO14]: We note that this SCR treatment is defined in the final ToR.

We suggest to do further work during/after the impact assessment as there might be more appropriate approaches from an economic point of view.

3.6 Application of the matching-adjustment to the risk-free interest rate term structure

The Matching Adjustment is to be applied as a parallel shift to the entire basic risk-free term structure as provided by EIOPA. Details regarding the determination of the Matching Adjustment are provided in the next section.

In the context of the SCR submodule for interest rate risk, it should be noted that the shocks should be applied not taking into account the Matching Adjustment.

4 Matching adjustments to the basic risk-free rate

4.1 Introduction

What do the matching adjustments intend to achieve?

- Historical data suggests that market values of bonds are more volatile than implied by their chances of defaulting alone.
- Where insurers ~~are not exposed to losses on forced sales~~~~may need to sell bonds to meet their unpredictable liabilities~~, they are generally not exposed to these short-term bond value fluctuations; ~~but not where they hold bonds to maturity~~
- Insurers are not exposed at all to losses on forced sales in the following situations:
 - When insurers are not exposed at all to forced sales because liabilities are predictable and the timing of asset cash flows enables the timely payment of liability cash flows.
 - When insurers are exposed to forced sales but can pass on the potential losses to policyholders, eg via market value adjustment (MVA) clauses.
- Additionally, there are situations where insurers are only partially exposed to losses on forced sales.
- ~~Insurers holding bonds for predictable portfolios can be more certain that they will be able to hold their bonds to maturity, and are therefore less exposed to short-term fluctuations in bond values. They~~In all cases, insurers are still exposed to default and potentially also to the cost associated with maintaining the credit quality of the portfolio should downgrades occur (depending on the company's investment strategy).
- The matching adjustment is an adjustment ~~to the discount rate~~ used to reflect the real risks and economics for insurers~~value such predictable liabilities~~, whereby the market value of the liability mirrors the market changes evident in the asset values which are not related to default or potentially downgrade costs. It can be expressed as is equal to the spread over the risk-free rate on admissible backing assets, less an estimate of the costs of default and potentially downgrade (the fundamental spread).

What is the intention of the application ratio?

- The application ratio (used for Article 77e) restricts the matching adjustment from its maximum to allow for possible mismatch stemming from the underwriting risks

Comment [ECO15]: We suggest to reword this paragraph to cover all the situations where the matching adjustment can be applied. The former wording did not seem to include savings products with MVAs for example.

Also the ToR explicitly refer to the expression "losses on forced sales" which is broader than "forced sales".

which are not allowed in the contract portfolios eligible for 77c application like discontinuances or earlier than expected payments on eligible business.

- It is based on a measure of these costs under given stress scenarios.
- In addition to the application ratio in 77e alternative, the matching adjustment is further restricted by scaling (4.6.3(a)).

4.2 Requirements for applying matching adjustments

1. Insurance undertakings shall use the rates of the relevant risk-free interest rate term structure to calculate the best estimate with respect to life insurance obligations with a matching adjustment as set out in Section 4.74.7, provided that the following conditions are met:

- (a) the conditions relating to the insurance obligations as set out in Section 4.44.4;
- (b) the conditions relating to the matching of asset and liability cash-flows as set out in Sections 4.6 and 4.7;
- (c) the conditions relating to the admissibility of assets in the matching asset portfolio as set out in Section 4.5.

2. The form of the matching adjustment to the risk-free curve will depend on the type of insurance obligation. Five forms of matching adjustments apply:

Two forms linking to the "classic" Matching Adjustment (Article 77c):

- (a) "77c standard": the matching adjustment for certain life insurance obligations with no policyholder options where limits apply to the proportion of assets held in credit quality step 3 and the level of matching adjustment applicable to these assets;
- (b) "77c alternative": the matching adjustment for certain life insurance obligations with no policyholder options and ignoring the limits in respect of assets of credit quality step 3;

Three forms linking to the "extended" Matching Adjustment (Article 77e):

- (c) "77e standard I": the extended matching adjustment for life insurance obligations or annuity obligations arising from non-life contracts including policyholder options;
- (d) "77e standard II": this version differs from 77e standard I only in the calculation of the application ratio; which in this case applies a 99.9% confidence level rather than the 99.5% underlying the stresses of the standard formula.
- (e) "77e alternative": the alternative adjustment for life insurance obligations or annuity obligations arising from non-life contracts differing from the standardised

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version in three ways: no cash flow matching is required; single eligible assets do not need to provide fixed cash flows; and credit quality limits do not apply for asset admissibility.;

Comment [ECO16]: We note that the „77e alternative“ MA is different in many aspects from the industry proposal.

3. The conditions set out in paragraph 1 may differ depending on the relevant form of the matching adjustment being applied. The adjustment in paragraph 2(c), 2(d) or 2(e) shall not apply for insurance obligations for which the adjustment referred to in paragraph 2(a) applies. The application of the adjustment in paragraph 2(a) - 2(e) depends on the scenario being applied:

- The “77c standard” matching adjustment referred to in paragraph 2(a) shall apply from scenario 1 to 3 and 5 to 12 (i.e. this adjustment shall not apply in scenario 0 and scenario 4);
- The “77c alternative” adjustment referred to in paragraph 2(b) shall apply for scenario 4;
- The “77e standard I” extended matching adjustment referred to in paragraph 2(c) shall apply from scenario 1 to 5 and in scenarios 10 and 12;
- The “77e standard II” extended matching adjustment referred to in paragraph 2(e) shall only apply in scenario 7.
- The “77e alternative” extended matching adjustment referred to in paragraph 2(d) shall only apply in scenario 6;

Comment [ECO17]: Typo: 2(e) relates to „77e alternative“, not „77e standard II“

Comment [ECO18]: Typo: 2(d) relates to „77e standard II“, not „77e alternative“

In applying the matching adjustment under the relevant scenarios the 4 steps set out in the next section should be followed.

4.3 Summary of the steps to follow in applying the different versions of the matching adjustment

	77c Standard	77c Alternative	77e Standard I	77e Standard II	77e Alternative
Step 1: identify the eligible liabilities	Longevity exposures with no further premiums or policyholder options (such as surrender)		All life insurance obligations and non-life annuities; policyholder options are permitted		
Step 2: identify the admissible assets	<ul style="list-style-type: none"> · Bonds and similar assets · Fixed cash-flows · No issuer options · Investment grade (33% max in credit step 3 apart from exposures to Member States' central governments and central banks denominated and funded in the domestic currency of 	<ul style="list-style-type: none"> · Bonds and similar assets · Fixed cash-flows · No issuer options · Investment grade apart from exposures to Member States' central governments and central banks denominated and funded in the domestic currency of that central government and central bank (no max in 	<ul style="list-style-type: none"> · Bonds and similar assets · Fixed cash-flows · No issuer options · Investment grade apart from exposures to Member States' central governments and central banks denominated and funded in the domestic currency of that central government and central bank (33% max in step 3) 	<ul style="list-style-type: none"> · Bonds and similar · No issuer options · No restriction on credit quality 	

	77c Standard	77c Alternative	77e Standard I	77e Standard II	77e Alternative
	that central government and central bank)	step 3)			
Step 3: consider the impact of matching governance requirements	<ul style="list-style-type: none"> Cash-flow matching required: the discounted value of cash-flow shortfalls must be below the 10% limit The discounted value of the asset cash-flows of the assigned portfolio should be higher than the best estimate of the liabilities excluding the matching adjustment It must be possible for the portfolio of eligible obligations and the assigned admissible asset portfolio to be ring-fenced or organised and managed separately from the rest of the business of the undertaking; if this is not possible, then matching adjustment cannot be applied to the portfolio 				<ul style="list-style-type: none"> Cash-flow matching is not required The value of the assigned portfolio of assets is not lower than the best estimate of the assigned liabilities calculated with the relevant risk free interest rate term structure including the matching adjustment] It must be possible for the portfolio of eligible obligations and the assigned admissible asset portfolio to be ring-fenced or organised and managed separately from the rest of the business of the undertaking
Step 4: the matching adjustment calculation	<p>The matching adjustment is equal to the spread over the risk-free rate, understood as the difference between the flat actuarial rate that equals the present values of liabilities with the market value of assets and the flat actuarial rate equivalent to RFR, less the fundamental spread provided. In respect of assets of credit quality step 3 the matching adjustment is capped at the higher of that applicable to credit step 1 or 2.</p> <p>The fundamental spread includes:</p> <ul style="list-style-type: none"> the cost of downgrades a floor of 75% of the long-term average spread 	Same as for 77c standard, but excluding the cap applicable to credit quality step 3	Same as 77c standard (including the cap), but with a floor of 80% of the long-term average, reduced by applying the application ratio		<ul style="list-style-type: none"> The matching adjustment is equal to the spread over the risk-free rate, understood as the difference between the flat actuarial rate that equals the present values of liabilities with the market value of assets and the flat actuarial rate equivalent to RFR, less the probability of default provided. No floor and no cost of downgrades applies. The result is reduced by applying the application ratio Where a sub-portfolio of obligations is identified for the purpose of the calculation of the MA but the MA is applied to the whole portfolio of insurance obligations, the effect of introducing the MA on the liability side does not exceed the difference between the present value of the asset cash flows, discounted with the risk-free interest rate curve, and the present value of the

Comment [ECO19]: This is inconsistent with Section 4.6.3a (see comment ECO29)

Comment [ECO20]: For profit-sharing products (and more generally for products with options and guarantees), it might be difficult to find the flat actuarial rate as the level of cash-flows also depends on the level of interest rates – finding the exact rate would require several runs. Therefore companies might have to use simplifications here.

	77c Standard	77c Alternative	77e Standard I	77e Standard II	77e Alternative
					asset cashflows, discounted with the risk-free interest rate curve including the MA.
Step 4a: calculating the application ratio			Application ratio = $\max(0, 1 - \text{discounted-cash-flow-shortfall} / \text{BE})$ Where <i>discounted-cash-flow-shortfall</i> covers the losses stemming from applying all the underwriting stresses of the standard formula SCR excluding longevity, expense, revision and disability recovery and allowing only for the cash-flows stemming from the replicating portfolio of admissible assets	Same as for 77e standard, but assuming a 99.9% confidence level (rather than the 99.5% confidence of the stresses of the standard formula SCR)	Same as for 77e standard

4.4 Step 1: identifying the liability types eligible for matching adjustments

Liability eligibility criteria applicable to **all versions** of the matching adjustment

1. Insurance contracts where market risk is borne by policyholder (i.e. unit-linked products) are not eligible for a matching adjustment.)

2. Policyholder participation in the distributable profits of a product shall not of itself render the product eligible or ineligible for a matching adjustment. All the eligibility criteria should be considered in the same manner as for guaranteed benefits.

Specific to **77c standard and alternative**

3. The matching adjustment referred to in paragraph 2(a) and 2(b) of Section 3.2 applies to obligations for which:

- a) the only underwriting risks connected to the portfolio of life insurance obligations are longevity risk, expense and revision risk and the contracts underlying the life insurance obligations include no options for the policy holder or only a surrender option where the surrender value does not exceed the value of the assets, valued in accordance with Article 75 of Directive 2009/138/EC, covering the life insurance obligations at the time the surrender option is exercised;
- b) the life insurance contracts underlying the portfolio of life insurance obligations do not give rise to future premium payments.

Comment [ECO21]: We would welcome clarification on products where the policyholder can switch between a pure unit-linked fund and an interest rate guarantee. It is not clear whether/how such products would be included.

Comment [ECO22]: Typo: this should refer to Section 4.2

Specific to 77e standard and alternative

4. The adjustments referred to in paragraph 2(c), 2(d) and 2(e) of Section 3.2 applies to all life insurance obligations and annuity obligations arising from non-life contracts. Health insurance obligations where the underlying business is pursued on a similar technical basis to that of life insurance shall be considered as life insurance obligations.

Comment [EC023]: Typo: this should refer to Section 4.2

4.5 Step 2: identifying the assets admissible to the replicating portfolio

Admissibility restrictions applicable to all versions of the matching adjustment

1. Assets shall only be admissible to the assigned portfolio for replicating eligible insurance obligations provided the following condition is met:

- (a) The assigned portfolio of assets consists of bonds and other assets with similar cash-flow characteristics;
- (b) The cash-flows of the assets of the assigned portfolio of assets cannot be changed by the issuers of the assets or any third parties.

2. In the event that issuers or third parties have the right to change cash-flows in such a manner that the necessary cash-flows may be restored at an equivalent or better level of credit risk, (as is the case with 'make-whole' clauses) the right to change shall not disqualify the asset for admissibility to the assigned portfolio

Specific to 77 c standard and alternative and 77e standard

3. Assets shall only be admissible to the assigned portfolio for replicating eligible insurance obligations provided the following conditions are met:

- (a) the cash-flows of the assets of the assigned portfolio of assets are fixed;
- (b) no assets of the assigned portfolio of assets have a credit quality below credit quality step 3⁵ unless they are exposures to Member States' central governments and central banks denominated and funded in the domestic currency of that central government and central bank;
- (c) the value of assigned assets allocated to the credit quality step 3 shall be limited to 33,33% of the total value of assigned assets. For this purpose, assigned assets shall not include exposures to Member States' central governments and central

⁵ Please see the association of credit assessments of an External Credit Assessment Institution (ECAI) to credit quality steps in Appendix MA1.

banks denominated and funded in the domestic currency of that central government and central bank. This condition does not apply for 77c alternative.

4. Insurance or reinsurance undertakings shall not consider an asset to have fixed cash-flows where either the asset has no predefined maturity or the date of maturity depends on the issuer or third party decisions or actions.

5. With reference to point 3(a), where cash-flows of the insurance obligations depend on inflation only, the insurance undertaking may consider the cash-flows as fixed provided that those assets replicate the inflation-linked cash-flows of the portfolio of insurance obligations.

4. The admissibility rules apply to each individual asset of the assigned matching portfolio. Cash-flows of a single asset cannot be split into admissible and inadmissible parts.]

5. The table below compares various asset classes against the restrictions on changeability and fixity of cash-flows. The “?” indicates where EIOPA would generally expect the asset class to be inadmissible where the restriction applies, though there may be exceptions. If undertakings include assets with a “?” in their assigned portfolio, they should demonstrate that the requirements have been met. Note that the restriction that cash-flows be fixed does not apply to 77e alternative.

Restrictions:

- A. Cash-flows can't be changed by third parties
- B. Fixed in timing and amount (in real or nominal terms)

Asset class	A	B
Standard or inflation-linked corporate bonds		
Standard or inflation-linked sovereign bonds		
Swaps with fixed underlying cash-flows		
Callable bonds	?	
Commercial mortgages with make-whole clauses		
Equity release mortgages	?	?
Floating rate notes		?
Asset backed securities with fixed cash-flows		

Comment [ECO24]: We note that this approach was chosen for the purpose of the LTGA (as this is EIOPA's interpretation of the draft legal texts). We understand this will limit the scope of application of the MA for a significant number of participants.

We believe that more work is needed during/after the impact assessment to find the definitions that better fit to the economic reality and avoid unintended consequences. We note that if this definition is used in future regulation, this is likely to have broader macroeconomic impacts and discourage investment in certain asset classes.

Comment [ECO25]: It should be clarified that variable-to-fixed swaps are included as long as the company receives the fixed leg of the swap.

Subordinated debt	?	
Preference shares	?	?
Currency swaps with fixed underlying cash-flows		
Bank hybrid debt	?	?
Other derivatives		?
Property (long lease)	?	

4.6 Step 3: considering the impact of cash-flow matching governance requirements

Applying to all versions of the matching adjustment

1. In addition to the requirements set out in Section 3.3, to apply either of the forms of the matching adjustments set out in paragraph 2(a), 2(b), 2(c) and 2(e) of Section 3.2, insurance and reinsurance undertakings shall be able to demonstrate the following conditions relating to the matching of asset and liability cash-flows are met:

- (a) the insurance undertaking has assigned a portfolio of assets, consisting of bonds and other assets with similar cash-flow characteristics, to cover the best estimate of the portfolio of insurance obligations and maintains that assignment over the lifetime of the obligations, except for the purpose of maintaining the replication of cash-flows between assets and liabilities where the cash-flows have materially changed such as the default of a bond;
- (b) the portfolio of insurance obligations to which the matching adjustment is applied and the assigned portfolio of assets are ring-fenced or identified, managed and organised separately from the other activities of the insurance undertakings, without any possibility of transfer.

2. The requirement that assets cover the best estimate of the portfolio of insurance obligations implies that the discounted value of the admissible asset cash-flows should not be lower than the value of the best estimate of the liabilities, where the discount rate applied is the basic risk-free rate only.

Specific to 77e alternative only

3. If undertakings do not have sufficient admissible assets to cover the best estimate of a whole portfolio of obligations, a sub-portfolio of obligations should be identified which can be covered by admissible assets. The identification of the sub-portfolio should ensure that

Comment [EC026]: Typo: this should refer to Section 4.3

Comment [EC027]: Typo: this should refer to Section 4.2

Comment [EC028]: It is not clear whether these asset cash-flows need to be adjusted for defaults or not.

Additionally Section 4.2. “Step 3” mentions “The value of the assigned portfolio”. We suggest using the same wording to avoid any confusion.

- (a) The present value of the liability cashflows equals the present value of the asset cashflows, where the discount rate applied is the basic risk-free rate only.
- (b) The identification of obligations shall be performed such that the whole portfolio of insurance obligations is scaled according to the proportion of the present value of the asset cashflows on the present value of the liability cashflows of the whole portfolio of obligations, where the discount rate applied is the basic risk-free rate only.

Comment [ECO29]: This is inconsistent with Section 4.2. “Step 3” mentioning that “The value of the assigned portfolio of assets is not lower than the best estimate of the assigned liabilities calculated with the relevant risk free interest rate term structure including the matching adjustment.”

4. In this case, undertakings may apply a matching adjustment to the whole portfolio of obligations, provided this is reflected in the matching adjustment calculation as specified in section 4.7 as well as in calculating the application ratio as specified in section 4.8.

Specific to 77c standard, 77c alternative and 77e standard

5. The future cash-flows of the assigned portfolio of assets replicate each of the future cash-flows of the portfolio of insurance obligations in the same currency and any mismatch does not give rise to risks which are material in relation to the risks inherent in the insurance business to which the matching adjustment is applied.

6. In respect of assets of credit quality step 4, 5 or 6, the matching adjustment shall be limited to the level applicable for credit quality step 3.)

This is a simplified approach which is taken for practicality reasons.

Comment [ECO30]: We understand that for 77c standard, 77c alternative and 77e standard, assets of credit quality step 4, 5 and 6 would be out of scope. Consequently we understand this paragraph is not needed.

7. Undertakings should carry out the following steps to assess the adequacy of cash-flow matching by duration:

- a) Step I: partition the cash-flows into intervals to determine the materiality of any timing mismatch. For the purpose of this impact assessment, a 1 year interval should be chosen.

The expected cash-flows of the liabilities should not materially differ from the cash-flows stemming from the admissible assets.

- b) Step II: Materiality should, for the purpose of the Impact Assessment, be interpreted as meaning that the sum of the discounted cash-flow shortfalls for each future year should not be greater than 10% of the best estimate of the obligations (a relatively high threshold is chosen

for the purpose of the assessment only, the actual threshold should be 3%).

Discounting of the asset and liability cash-flows for this assessment should be based on the basic risk-free rate only and any cash-flow surpluses for a given interval should be ignored.]

- c) Step III: Undertakings should report the degree of mismatch calculated as the sum of the discounted cash-flow shortfalls divided by the best Estimate.

This simplified method of determining the degree of mismatch and the high materiality limit have been selected for this exercise only in recognition of the fact that undertakings have not had the opportunity to structure their portfolios optimally.

Comment [ECO31]: We lack to see economic grounds for introducing this restriction. Please see our comment ECO37 at page 29.

Specific to 77c standard and alternative

8. The insurance obligations of an insurance contract may not be split into different parts when identifying the portfolio of eligible life insurance obligations. All benefits under the contract should be eligible in order to apply the 77c standard and alternative matching adjustments.

4.7 Step 4: calculation of the matching adjustment

Applying to all versions of the matching adjustment

1. For each currency and in respect of each maturity the maximum matching adjustment shall be calculated in accordance with the following principles:

- (a) the maximum matching adjustment shall be equal to the difference between the spread of the investment return over the basic risk-free rate of the assets of the assigned portfolio of replicating assets and the associated fundamental spread provided in Annex A. The spread of the investment return over the risk-free rate shall be equal to the difference of the following:
- (i) the annual effective rate, calculated as the single discount rate that, where applied to the cash-flows of the portfolio of insurance obligations, results in a value that is equal to the value in accordance with Article 75 of Directive 2009/138/EC of the portfolio of assigned assets;

- (ii) the annual effective rate, calculated as the single discount rate that, where applied to the cash-flows of the portfolio of insurance obligations, results in a value that is equal to the value of the best estimate of the portfolio of insurance obligations where the time value is taken into account using the basic risk-free interest rate term structure.

For 77c standard and alternative the matching adjustment is equal to the maximum matching adjustment. For 77e standard and alternative the matching adjustment is equal to the maximum matching adjustment multiplied by a reduction, to allow for the degree of matching implicit between the eligible liabilities and the cash-flows of the assigned portfolio of admissible assets. The calculation of this reduction is set out in section 4.8.

2. Should it be necessary to aggregate the fundamental spread across categories (asset classes, durations and ratings) when calculating the matching adjustment, the market values of assets within the category should be used as weights.

[This is a simplification chosen for the purpose of the assessment only.]

3. Insurance undertakings applying the calculation method laid down in paragraph 1 shall not be allowed to apply any other adjustments to the risk-free interest rate term structure for the affected liabilities. In respect of the liabilities of the undertaking to which a matching adjustment is not applied, other risk-free rate adjustments may be considered as relevant.

Specific to 77c standard and 77e standard

4. The fundamental spread for assets of credit quality step 3 shall be such that the matching adjustment in respect of these assets does not exceed the matching adjustment for assets of credit quality step 1 and 2 (see appendix MA1 for details on credit quality steps).

Specific to 77e alternative

5. If, in accordance with paragraph 3 of section 4.6, undertakings apply the matching adjustment to the full portfolio of obligations despite not having sufficient admissible assets, the matching adjustment shall be calculated according to 1(a) with the following amendments:

- (i) the annual effective rate in paragraph (a)(i) above may not be suitable. In such cases undertakings should refer to the spread of their admissible asset

Comment [EC032]: Depending on the level of aggregation, it might be more correct to use the "market value multiplied by the average duration" as weights.

Comment [EC033]: We would suggest to allow this simplification (including the modification suggested in the previous comment) going forward.

Comment [EC034]: It should be clarified that this restriction is not referring to extrapolation. According to Article 39 (5) of the Delegated Acts "the matching adjustment shall be applied to the extrapolated risk-free interest rates".

Comment [EC035]: This paragraph does not reflect the last amendments in Article 42 quinquies of the Draft Delegated Acts. The updated wording would be the following: "The matching adjustment for an asset of credit quality step 3 shall not exceed the higher of the matching adjustments for assets of credit quality step 1 and 2".

It would also be helpful to clarify that this restriction does not apply to government bonds.

yields over the basic risk-free rate directly, rather than as set out in 1(a)(i) and 1(a)(ii) above.

- (ii) The maximum matching adjustment as calculated according to 1(a) is reduced according to section 4.8.
- (iii) The effect of introducing the matching adjustment on the full portfolio of obligations does not exceed the difference between the present value of the asset cashflows of the admissible assets, discounted with the risk-free interest rate curve, and the present value of the asset cashflows of the admissible assets, discounted with the risk-free interest rate curve including the MA.⁶

6. A simplification may be used to adjust the matching adjustment so that the requirement in para 5 (iii) is met. A potential simplification is the application of the proportion as referred to in paragraph 3 (b) of section 4.6 to the matching adjustment as calculated in accordance with paragraph 5.

4.8 Step 4a: calculation of the application ratio

Specific to 77e standard I and alternative

1. The application ratio shall ensure that insurance undertakings incur no losses through forced sales of assets with a probability of 99.5% over the period till run-off of the obligations.
2. The application ratio shall apply to all insurance obligations to which this matching adjustment is applied, including those that do not include options for policyholders.
3. The application ratio in respect of a portfolio of eligible obligations shall be calculated according to the following formula:

$$\text{Application ratio} = \max \left(0, 1 - \frac{\text{discounted-cash-flow-shortfall}}{\text{best-estimate}} \right)$$

Where:

Discounted-cash-flow-shortfall reflects the losses through forced sales caused by the incidence of lapse risk, mortality risk, disability-morbidity risk and/or life catastrophe risk.

Comment [EC036]: The formula should be adapted to reflect that products with a full market value adjuster (MVA) in case of surrender are not exposed to losses through forced sales caused by the incidence of lapse risk.

For this kind of products with a full MVA the Discounted-cash-flow-shortfall should only reflect the losses through forced sales caused by the incidence of mortality risk, disability-morbidity risk and/or life catastrophe risk

⁶ This ensures that the effect on the assets is correctly transferred to the liability side and no overestimation occurs by applying the MA, that is in this case derived on the basis of a sub-portfolio, to the whole portfolio.

Best-estimate is the best-estimate liability in respect of the portfolio of matched obligations, calculated using the basic risk-free rate only. It should be noted that in case of the negative value for the best-estimate, no application of the matching adjustment can be made.

It should be noted that for 77e alternative, market risks would need to be taken into account as well for the discounted cash flow shortfall for assets without fixed cash flows, e.g. floating rate instruments. However, for simplicity reasons this is not required for this assessment.

4. The term *discounted-cash-flow-shortfall* shall be equal to the following:

$$\text{Discounted - cash - flow - shortfall} = \sqrt{\sum_{i,j} \text{Corr}L_{i,j} \cdot \text{DCFS}_i \cdot \text{DCFS}_j}$$

Where:

- the sum covers all possible combinations (*i,j*) of the risks covered;
- $\text{Corr}L_{(i,j)}$ denotes the correlation parameter for life underwriting risk for risks *i* and *j*;
- DCFS_i and DCFS_j denote the discounted cash-flow shortfalls by the incidence of risk *i* and *j* respectively.

5. The correlation parameter $\text{Corr}L(i,j)$ referred to in paragraph 10 shall be equal to the item set out in row *i* and in column *j* of the following correlation matrix:

<i>i</i> \ <i>j</i>	Mortality	Disability	Lapse	Life catastrophe
Mortality	1	0.25	0	0.25
Disability	0.25	1	0	0.25
Lapse	0	0	1	0.25
Life catastrophe	0.25	0.25	0.25	1

6. Depending on the underwriting risks to which the portfolio of life insurance obligations is exposed, the *discounted-cash-flow-shortfall* shall be equal to the sum of net annual cash out-flows stemming from applying the stresses that will occur over the lifetime of the insurance obligations. The net annual cash out-flows are equal to the cash out-flows from the portfolio of stressed obligations less the cash in-flows from the assigned

portfolio over the year. Negative net out-flows should be set to zero. The stresses to be applied are as follows:

- a. the more severe of the liability cash out-flows associated with an instantaneous lapse of 40% of the policies within the portfolio of matched obligations, and a permanent increase of 50% of the on-going lapse assumptions;
- b. the liability cash out-flows associated with an instantaneous permanent increase of 15% in the mortality rates;
- c. the liability cash out-flows associated with an instantaneous permanent increase of 35% in the disability and morbidity rates in the following 12 months and of 25% for all months after the following 12 months, in combination with an instantaneous permanent decrease of 20% in the disability and morbidity recovery rates in respect of the following 12 months and for all years thereafter.

7. The shocks should only apply to those insurance obligations for which stressed rates lead to an increase in liability cash-flows.

8. If, in accordance with section 4.7, undertakings apply the matching adjustment to the full portfolio of obligations despite not having sufficient admissible assets, the application ratio shall be calculated in respect of the portfolio of admissible assets and the sub-portfolio of insurance obligations as specified in section 4.7.

Paragraph 6 is based on the assumption that insurers will be able to make benefit payments up to one year after those payments fall due. In reality, the insurer should of course be able to make the payment in a much shorter time, at least within a month. However, it seems necessary to relax such a condition in this assessment for reasons of practicability. The derogation refers to this impact assessment exercise only and does not pre-empt any final outcomes of the Omnibus process.

Specific to 77e standard II

8. The application ratio shall be calculated as for 77e standard I, but with the stresses amended to reflect a 99.9% severity. The stresses to be applied are as follows:

- a. the more severe of the liability cash out-flows associated with an instantaneous lapse of 47% of the policies within the portfolio of

Comment [ECO37]: We disagree with this restriction as we lack to see economic grounds for introducing this restriction, which risks to cause problems for long-term products which can't be matched after a certain point (but would still not lead to any losses on forced sales).

We would like to recall that the current approach is already more conservative than it would have to be in an economic framework:

- No use of own funds to cope with timing issues in the cash flows – whereas in practice own funds would be used preferably to fund cash flow Shortfalls.
- No premium inflow arising from new business is considered, whereas in practice companies use this liquidity to cope with timing issues in the cash flows – instead we suppose that backing assets are sold in case of a Shortfall
- No use of other liquid assets which may cover the liabilities (eg cash, equities, etc)
- The liabilities are valued on a 1 in 200 basis whereas in all other parts of this framework 1 in 200 events are dealt with in the SCR

Therefore we believe that this additional restriction is not needed and that the possibility of using these net inflows to cover net out-flows in the following years should be reflected in the application ratio.

Comment [ECO38]: We understand these stresses correspond to the standard model 99.5% stresses. For internal model users, we would suggest clarifying that the stresses might be different (ie those of the internal model).

- matched obligations, and a permanent increase of 58% of the on-going lapse assumptions;
- b. the liability cash out-flows associated with an instantaneous permanent increase of 18% in the mortality rates;
 - c. the liability cash out-flows associated with an instantaneous permanent increase of 35% in the disability and morbidity rates in the following 12 months and of 25% for all months after the following 12 months, in combination with an instantaneous permanent decrease of 20% in the disability and morbidity recovery rates in respect of the following 12 months and for all years thereafter.

4.9 Example for 77e Standard

Please see separately provided spreadsheet. A more detailed description of the example will be provided later here.

4.10 Example for 77e Alternative

Please see separately provided spreadsheet. A more detailed description of the example will be provided later here.

4.11 Impact of the matching adjustment on the spread risk charge

1. The scenario-based spread risk charge applicable to the obligations to which a matching adjustment, as referred to in paragraph 2(a), 2(b), 2(c), 2(d) and 2(e) of Section 3.2, applies and to the assets of the corresponding assigned portfolio should be calculated as follows:

- To the assets the regular spread risk stress is applicable as would be if the assets were not eligible for the matching adjustment
- For the liabilities a revised matching adjustment which makes partial allowance for the spread stress should be calculated as follows:

$$MA' = (spread + Fup) - (FS + Fup * red_factor)$$

Where:

Spread and *FS* are the spread as outlined in paragraph 1(a) of Section ~~4.74.7~~ and the relevant fundamental spread;

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Fup is equivalent to the 1-year spread stress at the appropriate credit quality step;

Red_factor is as given in the table below:

Credit quality step	0	1	2	3	4	5	6
Reduction factor	0.45	0.50	0.60	0.75	1	1	1

Comment [EC039]: The calibrations seem very prudent. We would welcome a more in-depth analysis to derive these parameters during/after the LTGA. For example, when the MA is applied in full, the SCR should be based on default risk only which is considerably lower. When the MA is partially applied (Application Ratio < 1), then the reduction factor can be adapted using the application ratio.

The reduction factors have been set out as part of the framework of the matching adjustment for certain life insurance obligations (OMII 77c). For the sake of simplicity, the same reduction factors apply to the other adjustments for the purpose of the Impact Assessment. However, those reduction factors shall be revised in the final delegated acts and technical specifications for the adopted matching adjustments in order to take account of the risk of forced sales of assets, which increases undertakings' exposure to spread risk.

Appendix MA1: Association of credit assessments with credit quality steps

The credit assessments of an External Credit Assessment Institution (ECAI) are to be associated with the following credit quality steps:

Credit assessment provided by ECAIs		Credit quality steps associated
Standard & Poor's/Fitch	Moody's	
AAA	Aaa	0
AA	Aa	1
A	A	2
BBB	Baa	3
BB	Ba	4
Lower than BB, unrated	Lower than Ba, unrated	5-6, -

Appendix MA2: Fundamental Spreads provided by EIOPA

Please see separately provided spreadsheets.

Appendix DC1: Summary of data sources and input parameters for all currencies

Currency	Abbr.	Bloomberg code of ref. instr.	LLP (Y)	Credit rate adjustment			UFR (%)	Convergence Speed (Y)			
				31/12/2011	31/12/2009	31/12/2004		Option IIA	Option IIB	Option IIC	Option IID***
Euro	EUR	EUSAYY	20/30	35	20	10	4.2	QIS5	40	10	40
British pound	GBP	BPSWYY	50	35	20	10	4.2	QIS5	40	10	40
US Dollar	USD	USSWYY	30	35	20	10	4.2	QIS5	40	10	40
Japanese Yen	JPY	JYSWYY	20	35	20	10	4.2	QIS5	40	10	40
Swiss Franc	CHF	SFSWYY	15	35	20	10	4.2	QIS5	40	10	40
Swedish Krona	SEK	SKSWYY	10	35	20	10	4.2	QIS5	40	10	40
Danish Krone**	DKK	DKSWYY	20	35	20	10	4.2	QIS5	40	10	40
Norwegian Krone	NOK	NKSWYY	10	35	20	10	4.2	QIS5	40	10	40
Czech Koruna	CZK	CKSWYY	15	35	20	10	4.2	QIS5	40	10	40
Polish Zloty	PLN	PZSWYY	15	35	20	10	4.2	QIS5	40	10	40
Hungarian Forint	HUF	HFSWYY	15	35	20	10	4.2	QIS5	40	10	40
Romanian Lei	RON	RNSWYY	10	35	20	10	4.2	QIS5	40	10	40
Bulgarian Lev	BGN	BLSAYY	10	35	20	10	4.2	QIS5	40	10	40
Turkish Lira	TRY	TYSWYYV3	10	35	20	10	4.2	QIS5	40	10	40
Iceland Krona*	ISK	IKSWYY	5	35	20	10	4.2	QIS5	40	10	40
Estonian Kroon**	EKK	EUSAYY	20	35	20	10	4.2	QIS5	40	10	40
Latvian Lats**	LVL	EUSAYY	20	35	20	10	4.2	QIS5	40	10	40
Lithuanian Litas**	LTL	EUSAYY	20	35	20	10	4.2	QIS5	40	10	40
Canadian Dollar	CAD	CDSWYY	20	35	20	10	4.2	QIS5	40	10	40
Australian Dollar	AUD	ADSWYY	30	35	20	10	4.2	QIS5	40	10	40
Singaporean Dollar	SGD	SDSWYY	20	35	20	10	4.2	QIS5	40	10	40
Malaysian Ringgit*	MYR	MRSWYY	5	35	20	10	4.2	QIS5	40	10	40
South Korean Won*	KRW	KWSWYY	10	35	20	10	4.2	QIS5	40	10	40
Thai Baht*	THB	TBSWYY	10	35	20	10	4.2	QIS5	40	10	40
Hong Kong Dollar	HKD	HDSWYY	10	35	20	10	4.2	QIS5	40	10	40
Taiwanese Yuan*	TWD	NTSWYY	10	35	20	10	4.2	QIS5	40	10	40
Chinese Yuan Renminbi*	CNY	CCSWYY	15	35	20	10	4.2	QIS5	40	10	40
South African Rand	ZAR	SASWYY	30	35	20	10	4.2	QIS5	40	10	40
Mexican New Peso	MXN	MPSWYY	20	35	20	10	4.2	QIS5	40	10	40
Indian Rupee*	INR	IRSWYY	10	35	20	10	4.2	QIS5	40	10	40
Brazilian Real*	BRL	BCSWYY	10	35	20	10	4.2	QIS5	40	10	40

* Data are not available.

** Treated as currency pegged to the euro fulfilling or are assumed to fulfill the conditions of Article 40bis IR5 for the purposes of LTGA assessment.

*** In option D the LLP for EUR (DKK,EKK,LVL and LTL) is 30 years instead of 20 years.

Comment [ECO40]: We do not understand what scenario „Option IID“ refers to.

Appendix DC2: Background material on assessment of ADLT criteria and determination of the LLP

The determination of the entry point (Last Liquid Point, LLP) to the extrapolated part of the risk-free interest rate term structure requires the ADLT (active, deep, liquid and transparent) assessment for the reference instruments (swaps, government bonds) as well as for the general bond market.

For the availability and transparency check at least the following aspects shall be assessed:

- Appropriateness of data provider choice
- Frequency of data update
- Simple availability checks
- Plausibility checks and monitoring

For depth and liquidity there are a number of methods whether a market fulfills these criteria. A non-exhaustive list of indicators is described below:

- Bid-ask spread
- Trade frequency
- Trade volume
- Trader quotes/dealer surveys
- Quote counts (1): number of dealer quotes within a few day window
- Quote counts (2): number of dealers quoting
- Number of pricing sources
- Assessment of large trades and movement of prices (depth)
- Residual volume approach (for bonds only)

To confirm depth and liquidity of the instruments, the assessment shall not be restricted to the analysis of a single indicator but shall take all available information into account that can support the assessment. Markets can considerably differ and one all-encompassing methodology may not appropriately capture this difference. Furthermore, a single indicator may not capture well enough new market developments. For this reasons, common thresholds for all currencies are also not appropriate and may be

inconsistent with some of the general requirements for the risk-free rate, such as robustness, practicability, or incentive effects.

Appendix DC3: Background material on the credit risk adjustment

Swap rates constitute the primary calculation basis for the derivation of the risk free term structure under Solvency II. Although government bonds should be used as substitutes to swaps, if no active swap market exists in a given currency at a given maturities, it is safe to assume for practical purposes, and thus for the impact assessment, that mainly swap rates will be used. For this reason the credit and basis risk adjustment is structured mainly to filter out the credit risk from swap rates.

Section 3.3 of the above mentioned document describes the modalities of the risk adjustment. It is observed that:

- The same adjustment is applied to all currencies (i.e. the credit risk adjustment has the same size in basis points for all currencies);
- The adjustment is applied uniformly across all maturity points (i.e. a parallel shift of the observed swap term structure is done to cater for credit risk);
- The adjustment varies over time.

Furthermore, the document acknowledges that only a very limited amount of “direct” counter party credit risk pertains to swap agreements, since: (1) swap counterparties typically have to fulfil minimum credit rating eligibility requirements; (2) there are exit clauses if such minimum rating thresholds are passed after the initialisation of the swap; (3) credit enhancement is provided by collateral and mark-to-market arrangements; (4) credit risk is assumed only over the reset period of the swap. While the “direct” swap counterparty risk is minute, and can be assumed away, the swap rates are still not risk-free. It is observed that the rates underlying swap agreements carry counterparty risk, since they originate from unsecured interbank market transactions. For example, the floating leg of Euro area swaps is based on Euribor rates. Given that the floating leg is reflecting counterparty credit risk, also the fixed will embed credit risk, since in an efficient market the fixed leg will be based on expectations to future realisations of the floating rate, over the duration of the swap arrangement. This “indirect” type of credit risk, which is assumed to also account for basis risk, is the material reason why observed swap rates need to be adjusted.

Previous EIOPA exercises, e.g. QIS5 and Stress Tests, have assumed a 10bp credit risk adjustment. While a framework for the determination of the credit risk adjustment is still under preparation and without prejudging the outcome are these works in any way or form, for the purpose of the LTGA the determination of the adjustment takes into account the difference of swap and overnight rates.

The adjustment is based on an indicator that is generally accepted and widely used as a gauge for the “health” of the banking sector and expresses the difference between the price of unsecured lending and the price of lending over one-day, where the latter can be seen as “secure lending” although there are no risk mitigation applied apart from the short duration of the operation.

Based on an analysis of the overnight market compared to the swap market, it is suggested to use an adjustment of 35bp for the reference day of 30/12/2011.

Appendix DC4: Background material on the Smith-Wilson method

This appendix briefly describes how the Smith-Wilson (SW) extrapolation method will be implemented to calculate discount curves relevant for the LTGA. As is evident below, this document is still in draft form and will, and, once it is final, it be integrated in the Technical Annex accompanying the LTGA.

The SW method applied here follows closely the implementation structure outlined in the EIOPA document entitled “Risk-free interest rates – Extrapolation method”, which was drafted to support the QIS5 exercise.

At the outset, SW assumes that the price of a zero coupon rate can be expressed in the following way:

$$P(\tau_t) = e^{-UFR * \tau_t} + \sum_{k=1}^K z_k * \sum_{j=1}^J c_{k,j} * W(\tau_t, \tau_j) + e(\tau_t), \quad [1]$$

as a function of coupon paying bonds. The variable P denotes the price of a zero coupon bond, e is the exponential function, z_k denotes a set of parameter to be estimated (one parameter for each k), and K is equal to the number of observed bonds/rate points on the maturity scale. There are two maturity counting variables, τ_t and τ_j , that both span the whole set of maturities, at which bonds/rates are observed. The first maturity variable, τ_t , maps the rows of the Wilson function W, and the other maturity variable, τ_j , maps the columns of W: where the former can be interpreted as the maturities at which the final curves is observed, i.e. comprising observed, interpolated and extrapolated maturities, and where the latter contains the maturities at which bond coupon payments are observed. W is the Wilson function serves a purpose akin to the loading matrix in a “traditional” yield curve factor model, e.g. the Nelson-Siegel model or an affine multifactor yield curve model. However, whereas yield curve models traditionally are formulated and estimated on the basis of yield curve data, the Smith-Wilson model is calibrated to the prices of the corresponding fixed income securities. And, the matrix W therefore represents “loadings” for prices at different maturities, and not for yields directly. In other words, the Smith-Wilson methods calibrates the observed rates to the discount function rather than to the yield curve, however, as there if a simple mapping between these two metrics, it is easy to convert the extrapolated discount function to the corresponding discount rate term structure.

The Wilson function is defined in the following way:

$$W(\tau_t, \tau_j) = e^{-UFR * (\tau_t + \tau_j)} * \left\{ a * \min(\tau_t, \tau_j) - e^{-a * \max(\tau_t, \tau_j)} * \sinh[a * \min(\tau_t, \tau_j)] \right\}. \quad [2]$$

It is observed that this function is symmetric, and approaches zero as τ_t and τ_j increases in value (goes to infinity). It is this latter attribute that facilitates the convergence of the discount curve to the UFR, as seen in equation 1. While these features of the Wilson function may not be immediately clear when inspecting equation 2, a graphical representation can provide some added insights.

Figure 1: An example of the Wilson function

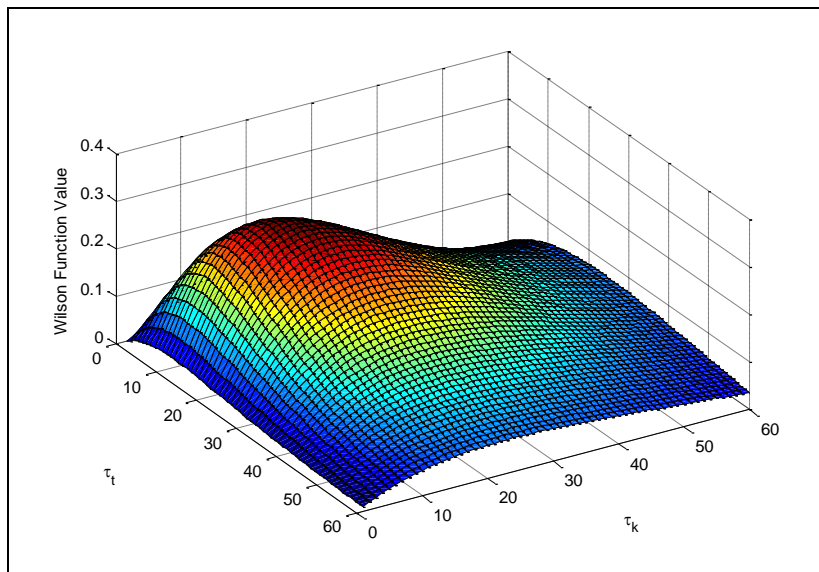


Figure 1 shows an example of the Wilson function for maturities from 1 to 60 years, using a convergence speed of $a=0.10$.

For the practical application of the Smith-Wilson model it is advantageous to work in matrix notation. As seen in Figure 1, the Wilson function is a symmetric matrix W , defined on the basis of maturity vectors. For the calibration work (τ_j) is set equal to the maturities at which the calculation basis rate is observed. For the calculation of the final interpolated and extrapolated discount curve (τ_t) is set equal to maturities from 0 to 150 years, where steps of one month is used for maturities below one year, and steps of one year is used for the remaining maturities.

Following the above mentioned EIOPA QIS5 document, the Smith-Wilson method can be written in matrix form as:

$$M = C * u + (C * W * C') * z. \quad [3]$$

Where M is a vector of ones, expressing that the observed coupon paying bonds are priced at par. This assumption is true under normal market circumstances for bonds, and probably true in general for our implementation that is based on swap rates. C is a matrix that contains the coupon payments for each bond/swap rate. Effectively, C is a K -

by-J matrix, W is the Wilson function and u collects the values of the exponential function in.

It follows from [3] that the SW parameters contained in z can be calculated in the following way:

$$z = (C * W * C')^{-1} * (m - C * u). \quad [4]$$

Armed with the z values, the SW interpolation and extrapolation method follows the matrix version of [1]:

$$P = u + (C * W) * z. \quad [5]$$

The resulting vector P is converted into a discount rate curve by $r_c = \frac{1}{\tau_t} * \log\left(\frac{1}{\bar{p}}\right)$, if continuously compounded rates are needed, and $r_d = \left(\frac{1}{\bar{p}}\right)^{\frac{1}{\tau_t}} - 1$, if annually compounded rates are needed.

Appendix DC5: Discount curves provided by EIOPA

See separate spread sheets numbered DC 5.1 to DC 5.4.