# LE BASI DI SOLVENCY II 2020 REVIEW. RISERVE TECNICHE E SCR PER LA FORMULA STANDARD

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## OVERVIEW OF AMENDMENTS (1/4)

### List of 19 Topics (Blue dealt with this paper)

This is the official list provided by the EU Commission to EIOPA

- Last Liquid Point and extrapolation beyond it
- Volatility Adjustment & Matching Adjustment
- Transitional Measures
- Risk Margin
- Capital Market Union
  - This includes the setting of market risks (property in particular) and equity risk symmetric adjustment as well as a 2nd set of changes relevant to the long - term equity investment (in addition to those already introduced into Solvency 2 2018 review)
- Dynamic Volatility Adjustment
  - Part relates to only Internal Model users and part to the possibility of introduction in Standard Formula

# OVERVIEW OF AMENDMENTS (2/4)

**List of 19 Topics**

SCR Standard Formula

- This includes
  - simplified calculations,
  - details of Nat CAT Risks already introduced with S2 2018 review,
  - review of parameters of U/W risks and
  - review of Interest rate Risk Formula
  - shifting of assets classes from counterparty risk to market risk
- Risk Mitigation techniques
  - Review of finite reinsurance and review of non – proportional reinsurance on non - life
- MCR
  - Redefinition of cap and floor
  - Sharing the supervisory behaviour in case MCR is breached
- Macro Prudential Issues
  - ORSA
  - Management of Systemic risk (discussion about a compulsory buffer to put on top of the SCR when the economic environment is good)
  - Liquidity risk management planning (with an eventual liquidity test and, in case it would not succeed, a mandatory SCR add - on)

## OVERVIEW OF AMENDMENTS (3/4)

**List of 19 Topics**

- Recovery and Resolution
  - Early intervention via shared trigger points
  - Common behaviour in case of insurer's default
  - "*Early intervention powers*" and "*preventive recovery planning*"
- Insurance Guarantee Schemes
- Freedom of services and freedom of establishment
- Group Supervision
  - Calculation of Group SCR
  - Calculation of "Minimum Group Consolidated SCR"
  - Governance
  - Supervisory of infra – group transactions
- Reporting and Disclosure
  - Review of existing QRT's with voluntary field test on January 2020
  - New QRT's
  - Introduction of disclosure of cyber risks
  - Requirements to achieve exemptions

## OVERVIEW OF AMENDMENTS (4/4)

### List of 19 Topics

- Proportionality and Thresholds
  - Small entities from current € 5 million proposed to € 10 m
- Best estimates
  - Review of definition of contract boundaries
  - How to use ESGs for Life business
  - Future management actions
  - Treatment of options and guarantees
  - Allowance for expenses in best estimates and treatment of expenses related to assets management
- Own fund at solo level
  - This include review of EPIFP: calculation and tiering
- Reducing reliance on credit ratings

## TEST OF IMPACT OF DVA – DYNAMIC VOLATILITY ADJUSTMENT – IN THE STANDARD FORMULA (1/3)

- Eiopa has taken the stance to not permit the usage of DVA within the standard formula despite the pressure of insurance industry.
- However, Eiopa decided to verify the impacts in case it were used.
- DVA consists in the reduction of the spread risk for [corporate] bonds and loans.
  - The spread risk on securitization positions and on credit derivatives should be left unchanged
- The contribution of each bond and of each loan to the spread risk becomes the result of the following formula:

$$Spread_{netDVA} = Spread * \max\left((1 - GAR * AR_5 * \min\left[\left(\frac{PVBP(bel)}{PVBP(MV)}\right);1\right]*(1\text{-RC}));RF_{cqs}\right)$$

## TEST OF IMPACT OF DVA – DYNAMIC VOLATILITY ADJUSTMENT – IN THE STANDARD FORMULA (2/3)

$$Spread_{netDVA} = Spread * \max\left((1 - GAR * AR_5 * \min\left[\left(\frac{PVBP(bel)}{PVBP(MV)}\right);1\right]*(1\text{-RC})); RF_{cqs}\right)$$

- Where the term "PVBP" indicates the shock – respectively on the best estimates and on the fixed income investments – of 1 bp of spread (assets) & volatility adjustment (best estimates)
- RC is the risk correction applied to the corporate bonds i.e. 50% for the HIA
- GAR is the assumed General Application Ratio that is 85% for the HIA
- RF(cqs) depends on the Credit Quality Step, that is 45% (CQS=0), 50% (CSQ=1), 60% (CQS=2), 75% (CQS=3), 100% (CQS >=4 or where a credit assessment by a nominated ECAI is not available).
- AR5 is the application ratio used for the proposed Volatility Adjustment

## TEST OF IMPACT OF DVA – DYNAMIC VOLATILITY ADJUSTMENT – IN THE STANDARD FORMULA (3/3)

$$Spread_{netDVA} = Spread * \max\left((1 - GAR * AR_5 * \min\left[\left(\frac{PVBP(bel)}{PVBP(MV)}\right);1\right]*(1\text{-RC}));RF_{cqs}\right)$$

Sensitivities of DVA mitigation to the parameters/variables:

1. RFcqs→ The lower the credit rating, the lower the DVA mitigation
2. GAR → the higher the General Application Ratio, the higher the DVA mitigation
3. AR5 → the higher the illiquidity of assets, the higher the 5th application ratio and the higher the DVA mitigation. AR5 is the application ratio used for the proposed Volatility Adjustment
4. The higher the sensitivity of best estimates to VA compared to the sensitivity of financial assets in respect to an equivalent credit spread, the higher the DVA mitigation
5. RC → The higher the risk correction, the lower the DVA mitigation.

The favour contribution of DVA (Dynamic Volatility Adjustment) would be – 18% of spread risk and -4.8% of SCR → Solvency ratio would raise by 13%.

## RISK MARGIN CARRIERS

The risk margin carrier is proposed to be decreasing over time according to an exponential weight (0.975^t). After 27.38 years it becomes 0.50 and cannot be less any more (note that 27.38 is the result of ln(0.5)/ln(0.975)).

$$RM = CoC * \sum_{T \geq 0} \frac{SCR_t * \max(0.5; 0.975^t)}{(1 + r_{t+1})^{(t+1)}}$$

The lamba factor set to 0.975 does not solve the concern about the contribution of mass lapse:

MASS LAPSE should be considered in accordance to the conditional probability. If so, the carrier could not exceed (1-0.4)^t where 0.4 (or 0.7) is the shock factor used in the standard formula.

Anyway, there's no proposal to modify the Mass Lapse contribution in such a way.

The formula as set out and disclosed above is able to reduce the risk margin by roughly 12% and the solvency ratio by 1 bp.

## LONG TERM EQUITY INVESTMENT (1/6)

### Background

"*Solvency II 2018 review*" amended the EU regulation with the introduction of list of properties that, if satisfied, make equities defined as "long term equity investment" and their contribution to equity risk is 22% irrespective of they are classified as type 1 or type 2

- A new property of equity investments across all current equity categories (including the newly formed "qualifying unlisted")
- Both within type 1 and type 2
- The contribution to equity risk is 22% without symmetric adjustment

## LONG TERM EQUITY INVESTMENT (2/6)

### Background

Here are the current characteristics of the necessary stocks:

1. They are from EU companies, and it doesn't matter if they are listed or not.
2. the insurance company clearly identifies them and specifies their holding period
3. They are placed within segregated funds that cover technical reserves and the company undertakes to keep them in those same funds until the reserves go in run off
4. The average holding period is at least 5 years (within each fund); if lower, they cannot be sold until the average reaches 5 years
5. The insurance company demonstrates with ALM that it will not need to sell them in the first 10 years from the evaluation date, either under normal conditions or under stressed conditions
6. Risk, investment and ALM management policies are integrated to deal with both the 5 year - requirement and the 10 - year requirement
7. In the case of shares held in mutual funds, all characteristics must be satisfied for the fund in question rather than for the underlying securities.

## LONG TERM EQUITY INVESTMENT (3/6)

### Background

If the conditions no longer apply, the insurance company must notify the supervisory authority and cannot assign this property to these or other equity investments for 3 years

That said,

- Eiopa proposes in the HIA to remove and weaken some requirements to enable the undertaking to elect more equities under the definition of “Long Term Equity Investment”. Note that the new requirements e) is harder to achieve than the old requirement 5) and all the requirements from e) to g) are harder than the Solvency 2 2018 previsions.

Where outlined in green, they relate to changes from HIA to the last 12/2020 advice

## LONG TERM EQUITY INVESTMENT (4/6)

a) Not necessary to specify the holding period of each equity investment

b) Not necessary they have to cover technical provisions (however, not consistent with f)

c) Not necessary the segregation of the fund from the other assets managed by the undertaking

d) Not necessary 5 years as minimum holding period; the new requirement would be the issue of a "policy for long term investment" for each long – term equity portfolio which reflects undertaking's commitment to hold the global exposure to equity in the sub -set of equity investment for a period that exceeds 5 years on average.

e) Not necessary the ALM demonstration; the new requirement(s) is (1) the corresponding liabilities belong to Bucket (or category) I and II as defined for the purpose of calculation of VA, (2) at least 12 years of Maculay duration of liabilities (10 years in the last advice), (3) as for GI liabilities, a sufficient liquidity buffer is in place for the portfolios of assets and liabilities.

f) To belong in Bucket I, the standard formula mortality shock has an impact lower than 5% (i.e. in the range -5% < shock < +%5) and surrenders are not permitted or have negligible effect on best estimates.

g) To belong in Bucket II, both the standard formula mortality shock and lapse shock have impacts lower than 5% (i.e. in the range -5% < shock < +%5)

## LONG TERM EQUITY INVESTMENT (5/6)

h) Condition 6. is strengthen with the requirement it shall be reported in ORSA; moreover, the ALM policy should avoid concentration of equity risk towards counterparties.

**The requirement of diversification has been strengthened in the final advice**

i) Controlled intra – Group equity investments shall be excluded from the sub – set of equity investments.

j) The proportion of LTE equities as of the total amount of equities [backing technical provisions] does not exceed the proportion of reserves held in buckets I and II in respect of life reserves. (test at level of undertaking)

k) Participations are excluded

## LONG TERM EQUITY INVESTMENT (6/6)

- As regards point e), the liquidity buffer for GI equity assets is defined by the following formula at level of GI portfolio:
- $buffer = {}^{HQLA}/_{Best\ Estimate}$ where best estimate are net of reinsurance
- Where HQLA are the "high – quality liquid assets" backing the GI Liabilities, defining 3 levels of assets and applying a "liquidity haircut" as defined below:
- Level 1 assets:
  - Haircut is 0% for the list of government bonds and more in general bonds which do not contribute to the spread risk under the standard formula;
  - Haircut is 0% for cash and cash equivalent
- Level 2A assets:
  - Haircut is 15% for bonds and loans rated CQS 0 or 1 (i.e. highest ratings)
- Level 2B assets:
  - Haircut is 25% for covered bonds rated CQS 0 or 1
  - Haircut is 50% for bonds and loans rated CQS 2 or 3

The following limits are applicable:

$$Level2a + Level2b \leq 40\% HQLA$$
$$Level2b \leq 15\% HQLA$$

LTE is permitted only if buffer >=1

## EXTRAPOLATION OF THE PAR YIELD CURVE (1/2)

### Last Liquid Point LLP extended to either 30 or 50 years

Smith- Wilson method of extrapolation under review

The new extrapolation method would supply lower interest rates than Smith – Wilson.

-0.211% at FY2019 (holistic impact assessment)

LLP 30 (or 50) years: National Supervisor could have the power to restrict dividends if the solvency ratio based on LLP at 30 (50) years is less than 100%.

The impact of the new extrapolation is as much high as the duration of liabilities is higher.

Not significant in Italy

However, the allowance for options at maturity (annuity and deferral of maturity date) might render the impact material

# EXTRAPOLATION OF THE PAR YIELD CURVE (2/2)

## 31/12/2019 – Holistic Impact Assessment

| | | | FY19, Holistic Impact Assessment |
|---|---|---|---|
| | delta S2 2020 proposal versus actual FY19 | time | NO volatility adjustment Alternative Extrapolation Method RFR |
| | 0,005% | 1 | -0,416% |
| | -0,003% | 2 | -0,394% |
| | 0,000% | 3 | -0,338% |
| | 0,010% | 4 | -0,275% |
| | 0,009% | 5 | -0,220% |
| | -0,003% | 6 | -0,167% |
| | 0,000% | 7 | -0,084% |
| | 0,000% | 8 | -0,018% |
| | -0,001% | 9 | 0,046% |
| | -0,001% | 10 | 0,112% |
| | -0,007% | 11 | 0,157% |
| | 0,010% | 12 | 0,223% |
| | 0,016% | 13 | 0,284% |
| | -0,007% | 14 | 0,314% |
| | 0,013% | 15 | 0,375% |
| | 0,020% | 16 | 0,409% |
| | 0,030% | 17 | 0,439% |
| | 0,035% | 18 | 0,466% |
| | 0,031% | 19 | 0,491% |
| | 0,012% | 20 | 0,512% |
| mean | 0,008% | | |

| | | | FY19, Holistic Impact Assessment |
|---|---|---|---|
| | delta S2 2020 proposal versus actual FY19 | time | NO volatility adjustment Alternative Extrapolation Method RFR |
| | -0,024% | 21 | 0,529% |
| | -0,059% | 22 | 0,557% |
| | -0,092% | 23 | 0,593% |
| | -0,121% | 24 | 0,637% |
| | -0,148% | 25 | 0,685% |
| | -0,171% | 26 | 0,737% |
| | -0,191% | 27 | 0,792% |
| | -0,209% | 28 | 0,848% |
| | -0,225% | 29 | 0,905% |
| | -0,238% | 30 | 0,963% |
| | -0,249% | 31 | 1,021% |
| | -0,258% | 32 | 1,078% |
| | -0,266% | 33 | 1,135% |
| | -0,272% | 34 | 1,191% |
| | -0,276% | 35 | 1,247% |
| | -0,280% | 36 | 1,301% |
| | -0,283% | 37 | 1,354% |
| | -0,285% | 38 | 1,405% |
| | -0,286% | 39 | 1,456% |
| | -0,286% | 40 | 1,505% |
| mean | -0,211% | | |

# IL POSSIBILE NUOVO METODO DI ESTRAPOLAZIONE DELLA CURVA TASSI (1/6)

*LLP: ultimo punto liquido; Valutazione DLT; Criterio di corrispondenza; Criterio del volume residuo*

- Gli ultimi punti liquidi (LLP) per tutte le valute sono derivati sulla base di una "valutazione DLT" che analizza se le singole scadenze degli strumenti di riferimento possono essere ricavate da mercati profondi, liquidi e trasparenti (DLT).
- La metodologia DLT è stata rivista dall'EIOPA nel 2017.
- Il Criterio di Matching è alternativo alla DLT: la LLP è l'ultima scadenza oltre la quale i flussi di cassa obbligazionari non sono più disponibili per abbinare i flussi di cassa delle passività effettive a date di valutazione definite
- Il criterio del Volume Residuo è la seconda alternativa al DTL: il LLP è la scadenza oltre la quale meno del 6% delle obbligazioni viene negoziato in un mercato trasparente, profondo e liquido.

## IL POSSIBILE NUOVO METODO DI ESTRAPOLAZIONE DELLA CURVA TASSI (2/6)

*UFR; FSP; il parametro di convergenza; LLFR; metodo alternativo*

- UFR è il tasso a termine definitivo. Questo parametro manterrebbe il suo significato dopo la revisione di Solvency II 2020. Attualmente è del 3,60% per la zona €.
- L'FSP è il «first smoothing point». Si tratta di un nuovo parametro introdotto solo dalla revisione Solvency II 2020. È stato calcolato per ciascuna valuta con il criterio del Volume Residuo e si basa sulle ultime informazioni disponibili.
- Per quanto riguarda la valuta € e GBP, FSP coincide con il relativo LLP, ovvero rispettivamente 20 e 30 anni. Tuttavia, potrebbe essere inferiore a LLP come ad esempio USD dove FSP è di 25 anni e LLP è di 30.
- Non dovrebbe essere variato per almeno 2 anni, dopodiché può essere aggiornato su nuove informazioni per un altro paio di anni e così via.

## IL POSSIBILE NUOVO METODO DI ESTRAPOLAZIONE DELLA CURVA TASSI (3/6)

*UFR; FSP; il parametro di convergenza; LLFR; metodo alternativo*

- LLFR è calcolato rispetto all'ultimo tasso a termine liquido (ultimo osservato) immediatamente prima di FSP.
- Il parametro di convergenza è un nuovo importante fattore da utilizzare nell'equazione che calcola ciascun tasso a termine oltre l'FSP. È indicato con il simbolo "a".
- L'insieme di nuove equazioni è denominato "metodo alternativo".
- Con l'introduzione del metodo alternativo, non è necessario estendere il LLP a 30 o 50 anni, quindi il LLP rimarrebbe a 20 anni.

## IL POSSIBILE NUOVO METODO DI ESTRAPOLAZIONE DELLA CURVA TASSI (4/6)

- La principale nuova equazione che sostituisce il metodo di estrapolazione di Smith Wilson che l'EIOPA suggerisce per il calcolo di ciascun tasso a termine oltre FSP fino all'ultima scadenza corrispondente all'UFR (ovvero 60 anni per la valuta € che è 40 anni oltre LLP e FSP) è la seguente:

$$F_{FSP,FSP+h} = \ln(1+UFR) + [LLFR - \ln(1+UFR)] * (\frac{1-e^{-ah}}{ah})$$

- Dove 0 <h <= 40 e "a" = 0,10
- a = 0,10 è il parametro di convergenza. Notare che minore è la "a", minore è il tasso a termine estrapolato (e quindi maggiore è la migliore stima a parità di tutti gli altri fattori).

## IL POSSIBILE NUOVO METODO DI ESTRAPOLAZIONE DELLA CURVA TASSI (5/6)

*Presumibile un periodo di transizione per il parametro di convergenza valida fino al 2032. Il parametro di convergenza nella transizione viene calcolato in due passaggi:*

- Un primo passo a seconda dei tassi di interesse aggiornati (vedi sotto);
- Un secondo passo che interpola linearmente il risultato del primo passo con 0,10 a seconda della distanza tra la prima applicazione della revisione SII 2020 e l'anno 2032

  - Il primo passo imposta “a” = 0,20 se il tasso di interesse privo di rischio corrispondente a FSP è <= - 0,5%, cioè quando è materialmente negativo. Se il tasso privo di rischio è superiore a + 0,5%, la "a" rimane 0,10 (ovvero la transizione non è applicabile). Se tale tasso privo di rischio è compreso tra -0,5% e + 0,5%, "a" si ottiene mediante interpolazione lineare tra 0,10 e 0,20.

- Per le valute il cui FSP <15 anni, il parametro di convergenza è impostato su 0,14 invece di 0,10.
- Alle imprese verrebbe richiesta la sensitività rispetto all'abbassamento di "a" a solo 0,05.

## IL POSSIBILE NUOVO METODO DI ESTRAPOLAZIONE DELLA CURVA TASSI (6/6)

*Come estrapolare includendo il Volatility Adjustment (VA).*

- Per i tassi di interesse fino a LLFR, non cambia nulla, quindi il VA viene aggiunto ai tassi privi di rischio.

$$F_{FSP,FSP+h;VA} = \ln(1+UFR) + [LLFR^{VA} - \ln(1+UFR)] * (\frac{1-e^{-ah}}{ah})$$

- Oltre tale nodo, l'equazione è la seguente:

$$LLFR^{VA} = w_{20} * F^{VA}_{15;20} + w_{25} * F_{20;25} + w_{30} * F_{20;30} + w_{40} * F_{20;40} + w_{50} * F_{20;50}$$

- viene quindi ottenuta attraverso una media ponderata i cui pesi "w" vengono aggiornati annualmente dall'EIOPA secondo la valutazione DLT, ovvero in base alla loro liquidità che dipende infine dagli importi nozionali scambiati a quelle scadenze.

## INTEREST RATE RISK (1/8)

# EIOPA CRAVED FOR AN URGENT CHANGE OF INTEREST RATE RISK

The 2nd round of review of Solvency II EU Regulation 35 will include a change of formula of interest rate risk for standard formula users.

This was not requested by EU Parliament. However, Eiopa is supportive of the review, particularly to manage the negative interest rates which were not a concern during the period prior to the issue of Regulation 35 when interest rates were always positive

EIOPA believes that the current shocks provided in the Delegated Regulation for interest rate risk do not meet the requirements of Article 101(3) of the Solvency II Directive. Therefore, EIOPA strongly advises the Commission to correct this unintended technical inconsistency and to modify the way capital requirements for interest rate risk are calculated in the Delegated Regulation.

EIOPA ACCEPTED (February 2018) THE INSURANCE EUROPE PROPOSAL REFERRED TO AS “SHIFTED APPROACH” even though after having amended the calibration of parameters.

EIOPA advises to model interest rate risk in the standard formula with a relative shift approach, parameters of which vary in function of the maturity. Shifted approaches are widely used by internal model users and most stakeholders have argued during the consultation phases that this is a robust and risk-sensitive way to measure interest rate risk.

## INTEREST RATE up FORMULA

The increased term structure for a given currency shall be equal to:

$$rtup(m)=rt(m)*(1+smup) + bmup$$

where $rt(m)$ denotes the risk-free rate in the corresponding currency, m denotes the maturity and $bmup$ and $smup$ are given by the following table.

For maturities not specified in the table above, the value of $smup$ and $bmup$ shall be linearly interpolated. For maturities shorter than one year the value of $smup$ and $bmup$ shall be equal to 61% and 2.14% respectively. For maturities longer than 60 years, the value of $bmup$ shall be equal to 0%. For maturities longer than 90 years, the value of $smup$ shall be equal to 20%.

## INTEREST RATE down FORMULA

The decreased term structure for a given currency shall be equal to:

$$rtdown(m)=rt(m)*(1-smdown)-bmdown$$

where rt(m) denotes the risk-free rate in the corresponding currency, m denotes the maturity and $bmdown$ and $smdown$ are given by the following table

For maturities not specified in the table above, the value of *smdown* and $bmdown$ shall be linearly interpolated. For maturities shorter than one year the value of *smdown* and $bmdown$ shall be equal to 58% and 1.16% respectively. For maturities longer than 60 years the value of $bmdown$ shall be equal to 0%. For maturities longer than 90 years the value of *smdown* shall be equal to 20%.

# INTEREST RATE RISK (4/8)

| Maturity m | $smdown$ | $bmdown$ |
|---|---|---|
| 1 | 58% | 1.16% |
| 2 | 51% | 0.99% |
| 3 | 44% | 0.83% |
| 4 | 40% | 0.74% |
| 5 | 40% | 0.71% |
| 6 | 38% | 0.67% |
| 7 | 37% | 0.63% |
| 8 | 38% | 0.62% |
| 9 | 39% | 0.61% |
| 10 | 40% | 0.61% |
| 11 | 41% | 0.60% |
| 12 | 42% | 0.60% |
| 13 | 43% | 0.59% |
| 14 | 44% | 0.58% |
| 15 | 45% | 0.57% |
| 16 | 47% | 0.56% |
| 17 | 48% | 0.55% |
| 18 | 49% | 0.54% |
| 19 | 49% | 0.52% |
| 20 | 50% | 0.50% |
| 60 | 33% | 0% |
| 90 | 20% | 0% |

| Maturity m | $smup$ | $bmup$ |
|---|---|---|
| 1 | 61% | 2.14% |
| 2 | 53% | 1.86% |
| 3 | 49% | 1.72% |
| 4 | 46% | 1.61% |
| 5 | 45% | 1.58% |
| 6 | 41% | 1.44% |
| 7 | 37% | 1.30% |
| 8 | 34% | 1.19% |
| 9 | 32% | 1.12% |
| 10 | 30% | 1.05% |
| 11 | 30% | 1.05% |
| 12 | 30% | 1.05% |
| 13 | 30% | 1.05% |
| 14 | 29% | 1.02% |
| 15 | 28% | 0.98% |
| 16 | 28% | 0.98% |
| 17 | 27% | 0.95% |
| 18 | 26% | 0.91% |
| 19 | 26% | 0.91% |
| 20 | 25% | 0.88% |
| 60 | 22% | 0% |
| 90 | 20% | 0% |

# INTEREST RATE RISK (5/8)

31/12/2019

| The formula is the same as suggested on February 2018 | The formula is the same as suggested on February 2018 | Current formula, anyway based on the new suggested curve | Current formula, anyway based on the new suggested curve | time |
|---|---|---|---|---|
| Scenario 1- Up Shock | Scenario 1 - Down Shock | Scenario 2 - Up Shock | Scenario 2 - Down Shock | |
| 1,470% | -1,335% | 0,584% | -0,416% | 1 |
| 1,258% | -1,183% | 0,606% | -0,394% | 2 |
| 1,216% | -1,019% | 0,662% | -0,338% | 3 |
| 1,209% | -0,905% | 0,725% | -0,275% | 4 |
| 1,261% | -0,842% | 0,780% | -0,220% | 5 |
| 1,204% | -0,774% | 0,833% | -0,167% | 6 |
| 1,184% | -0,683% | 0,916% | -0,084% | 7 |
| 1,166% | -0,631% | 0,982% | -0,018% | 8 |
| 1,181% | -0,582% | 1,046% | 0,026% | 9 |
| 1,196% | -0,543% | 1,112% | 0,065% | 10 |
| 1,254% | -0,507% | 1,157% | 0,096% | 11 |
| 1,340% | -0,471% | 1,223% | 0,141% | 12 |
| 1,419% | -0,428% | 1,284% | 0,185% | 13 |
| 1,425% | -0,404% | 1,314% | 0,207% | 14 |
| 1,460% | -0,364% | 1,375% | 0,251% | 15 |
| 1,504% | -0,343% | 1,409% | 0,282% | 16 |
| 1,508% | -0,321% | 1,439% | 0,308% | 17 |
| 1,498% | -0,302% | 1,466% | 0,331% | 18 |
| 1,528% | -0,270% | 1,491% | 0,358% | 19 |
| 1,520% | -0,244% | 1,512% | 0,379% | 20 |

## INTEREST RATE RISK (6/8)

31/12/2019

| The formula is the same as suggested on February 2018 | The formula is the same as suggested on February 2018 | Current formula, anyway based on the new suggested curve | Current formula, anyway based on the new suggested curve | time |
|---|---|---|---|---|
| Scenario 1- Up Shock | Scenario 1 - Down Shock | Scenario 2 - Up Shock | Scenario 2 - Down Shock | |
| 1,519% | -0,221% | 1,529% | 0,392% | 21 |
| 1,531% | -0,192% | 1,557% | 0,413% | 22 |
| 1,555% | -0,158% | 1,593% | 0,441% | 23 |
| 1,586% | -0,121% | 1,637% | 0,473% | 24 |
| 1,624% | -0,080% | 1,685% | 0,510% | 25 |
| 1,666% | -0,037% | 1,737% | 0,549% | 26 |
| 1,712% | 0,007% | 1,792% | 0,591% | 27 |
| 1,759% | 0,053% | 1,848% | 0,633% | 28 |
| 1,808% | 0,100% | 1,905% | 0,677% | 29 |
| 1,857% | 0,148% | 1,963% | 0,721% | 30 |
| 1,906% | 0,196% | 2,021% | 0,765% | 31 |
| 1,955% | 0,245% | 2,078% | 0,809% | 32 |
| 2,003% | 0,293% | 2,135% | 0,853% | 33 |
| 2,049% | 0,342% | 2,191% | 0,896% | 34 |
| 2,095% | 0,391% | 2,247% | 0,939% | 35 |
| 2,139% | 0,440% | 2,301% | 0,980% | 36 |
| 2,182% | 0,488% | 2,354% | 1,022% | 37 |
| 2,223% | 0,536% | 2,405% | 1,062% | 38 |
| 2,262% | 0,584% | 2,456% | 1,101% | 39 |
| 2,300% | 0,632% | 2,505% | 1,140% | 40 |

## INTEREST RATE RISK (7/8)

### Impact analysis (February 2018)

The impact of the new methodology had been analysed on the basis of a specific information request. The impact of the methodology is material, in particular for those undertakings where the liability cash-flows depend on the level of interest rates. For life undertakings that are exposed to the low-yield environment, the average impact on the solvency ratio was estimated being around 14 percentage points (from a solvency ratio of 216% to a solvency ratio of 202%).

### PERIOD OF TRANSITION (ONLY FOR INTEREST RATE DOWN)

In light of the material impact, EIOPA advises that such an approach is gradually implemented in the Delegated Regulation. EIOPA recommends to phase-in its proposal over the next 3 years (5 years in the last advice), ensuring that, during the phasing-in of the approach, the interest rate risk is assessed in a robust way for all maturities and currencies. After the 3 (5) years, the capital requirements for interest rate risk and their impact should then be assessed as part of the review of Solvency II that the Commission is required to undertake after five years of implementation.

## INTEREST RATE RISK (8/8)

### PERIOD OF TRANSITION (ONLY FOR INTEREST RATE DOWN)

When calculating the risk of a decrease in the term structure of interest rates for a given currency, undertakings should:

i. Determine the decrease in basic risk-free interest rates on the basis of the current standard formula approach (i.e. on the basis of the current provisions of Article 167 of the Delegated Regulation);

ii. Determine the decrease in basic risk-free interest rates on the basis of the shifted approach as specified above;

iii. Calculate the loss in the basic own funds that would result from an instantaneous decrease in the basic risk-free interest rates determined, for each maturity:

First year: as in i. plus one third of the difference between ii. and i.

Second year: as in i. plus two third of the difference between ii. and i.

Third year: as in ii.

## INTEREST RATE RISK. FINAL ADVICE

Scenario 1 confirmed

Transition period: 5 years (not 3)

Risk down. Absolute lower floor: -1.25%.

If applied to FY2019, the 1 – year shock down would be mitigated.

## VOLATILITY ADJUSTMENT (1/26)
## HOLISTIC IMPACT ASSESSMENT (1/12)

**The new Proposal for the Volatility Adjustment**

Two components, (1) the Permanent and (2) the Macroeconomic.

### Permanent VA.

This is “permanent” because specific the € zone and not depending on the Country.

$$VA = GAR \cdot AR4 \cdot AR5 \cdot Scalec \cdot RC\_Sc \qquad \text{(va1)}$$

- GAR is said “General application ratio” and equates 85%. In theory, it will never be refreshed. It was 65% during the 1st call of fall 2019.
- AR4 and AR5 are both “application ratios”. They multiply each other. Its was the lower after their comparison during the 1st call of fall 2019.
- RC_Sc is the risk corrected spread

## VOLATILITY ADJUSTMENT (2/26)
## HOLISTIC IMPACT ASSESSMENT (2/12)

### AR5

Features and properties

- Entity specific: YES
- Rewards the annuities in payment and the saving contracts
- Penalizes the contracts exposed to lapse risks, either because frequencies are high, or because surrender values are not proportional to the market values of the underlying assets
- Illiquidity means predictability, i.e. future insurance cash flows are expected on average in their amounts and times, will vary little from the previsions. Therefore, given the best estimate of future insurance cash flows on the base of the expected average, the volatility of best estimate is little.
- AR5 shall reward the illiquidity characteristics of the liabilities: insurers who rely on the predictability of activity of selling their financial investments could earn a liquidity premium included in their assets which, turn, rewards their illiquidity.

To be Continued →

## VOLATILITY ADJUSTMENT (3/26)
## HOLISTIC IMPACT ASSESSMENT (3/12)

### AR5

- That said, the AR5 makes the Volatility Adjustment higher for predictable insurance cash flows and illiquid underlying assets.
- How much insurance cash flows are predictable is measured through sensitivities with respect to Homogeneous Risk Groups (HRG)
- Sensitivities are in respect to mortality and lapse up. If contracts do not allow surrenders, the sensitivity is limited to the mortality. The same happens in case surrender is granted and, however, impact is favour (i.e. decrease of best estimates) or negligible.
- Surrender option includes the request to not opt for the life contingent annuity in case contract enables policyholder to do so at maturity.
- As regards GI, only Health Insurance is subject to the sensitivities and only Health Similar to Life is subject to the lapse up test.
- The shock parameters are the same as stated by the Standard Formula.

To be Continued →

## VOLATILITY ADJUSTMENT (4/26)
## HOLISTIC IMPACT ASSESSMENT (4/12)

### AR5

- If mortality shock results in more than 5% of change in best estimate (adverse or favour does not matter), than the HRG belongs to bucket 3 and AR5 is set at its minimum level, that is 60%
- If mortality shock is less than 5% (i.e. in the range -5% < shock < +%5) and surrenders are not permitted or negligible, than the HRG belongs to bucket 1 and AR5 is set at its maximum level, that is 100%.
- For most of life insurances, where surrender options are important features, to belong to bucket 2 whose AR5 is set to 75%, both mortality and lapse up shock must be lower than 5%, i.e. both in the range -5% < shock < +5%.

$$AR5=\max(\min(BEI\cdot AR5, I+BEII\cdot AR5, II+BEIII\cdot AR5, III)/(BEI+BEII+BEIII);100\%);60\%) \qquad \text{(va2)}$$

- The final result, at level of Legal Entity, is achieved as weighted average of results of the 3 buckets, whose weighs are represented by the corresponding best estimates.

## AR4 and Scale

### Features and properties

- Entity specific: AR4 YES, Scale NO
- AR4 rewards long duration of assets compared to the insurance obligations, assets exposed to credit risks (low credit quality) and portfolio of assets with important component of financial assets which are credit exposed
- The current volatility adjustment does not look at the materiality of financial assets which are exposed to the credit spread.
- In fact, the VA is reduced by the share of non – exposed assets (such as equities and properties) measured once a year on average within the countries using the €.
- The current factor is set to 70.9% for the € zone.

Setting this ratio according to an entity specific composition of assets implies a couple of changes: (1) to switch off the aforementioned current factor and (2) to introduce an entity specific factor which at least is able to avoid the “overshooting”. Overshooting is an unjustifiable use of VA which some entities achieve in spite of they have low exposure to the spread risk.

## AR4 and Scale

The first intervention is got introducing the scale for currency Scale (c ) that is 141% (i.e. 1/70.9%) for the € zone

$$Scalec=1/(wgov,c+wcorp,c) \quad \text{(va3)}$$

The second intervention is got with AR4, the fourth application ratio.

In particular, the

$$AR4=\min\{PVBP(MVi,cFI)/PVBP(BELi,c);1\} \quad \text{(va4)}$$

The lower the numerator, the lower the ratio because it is sensible to the overshooting and aims to penalize it. Overshooting manifests in 3 different ways:

- The volumes of financial assets exposed to the credit spreads are materially lower than the technical provisions
- The credit duration of assets is materially lower than the duration of insurance obligations and expenses
- The credit quality of entity specific assets is significantly higher than the average which the current VA is based to (also known as “reference portfolio”).

## AR4 and Scale

For making AR4 < 1 when assets have high quality step, both the numerator and the denominator of AR4 are represented by sensitivities in respect to change of risk corrected spread, (reduced proportionally to the GAR) as follows:

$$PVBP(MVi,cFI)=[MVi,cFI(CS)- MVi,cFI(CS+GAR\cdot RC\_Sc)]/(GAR\cdot RC\_Sc) \quad \text{(va5i)}$$

$$PVBP(BELi,c)=[BELi,c(RFRc)- BELi,c(RFRc+GAR\cdot RC\_Sc)]/(GAR\cdot RC\_Sc) \quad \text{(va5ii)}$$

Performing the valuation via sensitivities does not prejudice the capability to catch the first 2 abovementioned characteristics.

# Risk Corrected Spread "RC_ Sc"

## Features and properties

- Entity specific: NO, it's 0.167% at FY2019
- The risk corrected spread for any currency such as € is given as difference between (1) the spreads of government and corporate bonds and (2) the risk correction.
- The spreads of government and corporate bonds is given by the following formula:

$$RC\_Sc=(Wc,gov\cdot RC\_Sc,gov+Wc,corp\cdot RC\_Sc,corp) \,/\, (Wc,gov+Wc,corp) \qquad \text{(va6i)}$$

That is a weighted average between the observations on government and corporate bonds

Compared to the current formula, its result is higher (all the other being equal) thanks to the missing denominator which resulted <1. The current formula is shown below

$$RC\_Sccurrent=Wc,gov\cdot RC\_Sc,gov+Wc,corp\cdot RC\_Sc,corp \qquad \text{(va6ii)}$$

- Eiopa writes: *"This division is introduced to ensure that, under option 4, the weights that are used to aggregate the risk corrected spreads within the portfolios of corporate and government bonds are relative to the fixed income investments of the undertakings, rather than to the total investments of the undertakings.*"

## Risk Corrected Spread "RC_ Sc"

The risk correction is more penalizing than in the current formula. It's envisaged in the Holistic Impact Assessment the following formula:

For government bonds and corporate bonds respectively:

$$RC = 30\% \cdot \min(S+, LTAS+) + 20\% \cdot \max(S+ - LTAS+, 0) \quad \text{(va7i)}$$

$$RC = 50\% \cdot \min(S+, LTAS+) + 40\% \cdot \max(S+ - LTAS+, 0) \quad \text{(va7ii)}$$

How to read the formula, for example for corporate bonds: risk correction is at least 50% of the lower between the last reported credit spread and the long - term credit spread (where each can't be negative). In addition, 40% of the excess, if any, of the last reported credit spread as of the long - term credit spread.

The original proposal(s) were based on a % of the last reported credit spread. They were criticized for being wholly multiplicative and, in addition, proportional to the last reported credit spread. That features pushes the pro – cyclical effects rather than the hoped anti – cyclical.

Such change under test in the HIA mitigates in part the pro – cyclical effect.

# Country Specific component of Volatility Adjustment

## Option 7

The country specific component, known as “option 7”, looks like the current country VA with a couple of exceptions that are “R” and w$country$, $c$

$$Country\ add{-}on = GAR \cdot \omega country,c \cdot max(SRCcountry - R \cdot SRCcurrency; 0) \quad \text{(va8)}$$

R is set to 1.3; the current formula sets out 2.0

$\omega country$, $c$ ranges between 0.60 and 0.90. The current formula sets out 85%

It stands for (current), the formula is applicable if and only if the country specific risk corrected spread overcomes the € risk corrected credit spread by at least 85 basis point.

With the Eiopa proposal, 85 bp would become $\omega country$, $c$

## Country Specific component of Volatility Adjustment

New formula would be:

$$VA_{new} = GAR * w_{country} * \max(spread_{rc_{country}} - R * spread_{rc_{currency}}; 0) \quad \text{(va9i)}$$

Where GAR 85% is the "*general application ratio*"

Where R is set to 1.3; the current formula sets out 2.0

$$w_{country} = {}^{(spread_{rc\_country} - 60)}/_{30} \quad \text{(va9ii)}$$

If the risk corrected country spread (briefly RCCS) ranges between 60 and 90 bp

It's nil if RCCS is below 60 bp and becomes 100% if RCCS is above 90 bp.

The smoothing impact of formula va9ii is said to be solution to the current "*cliff - edge effect*"

## Country Specific component of Volatility Adjustment

Current formula is:

$$VA_{now} = 65\%\, w_{country} * \max(spread_{rc_{country}} - 2.0 * spread_{rc_{currency}}; 0) \qquad \text{(va10)}$$

Where

$$w_{country} = 100\%$$

if the risk corrected country spread is above 85 bp, otherwise it's nil.

## VOLATILITY ADJUSTMENT (13/26)
## ORIGINAL SETTING (1/14)

### Risk Corrected Spread

The original idea was to check two alternative approaches, known as option 1 and option 2.

Both are entity specific rather than specific of a representative portfolio of assets.

As such:

- They are fit for taking into account the level of country volatility adjustment, even specific of that entity (if so, it is called "own asset VA")
- Formula va6i is not applicable. In fact, both aim to define the risk corrected spread

Option 1 replaces the current VA. **Moreover, it can be combined with options 4 and 5 because it's essentially a way to measure the Risk Correction. Such a combination is referred to as "APPROACH 2"**

**In contrast, APPROACH 1" combines options 4 and 5 as well as a risk correction which was originally stated as option 6. Approach 1 enables to add the Macro Prudential VA, that is described in option 8 provided that the country specific VA is not enacted (final advice is different).**

Option 2 is consistent with the current VA; thus, options 1, 4, 5, 7, 8 are not applicable

Option 2 is meant to be added to the current VA. It's rarely effective due to the conditions and restrictions to be satisfied

In option 1, the weights are entity specific whereas the risk corrections are supplied by Eiopa: Eiopa provides risk corrections with the granularity of asset type, credit quality, duration and currency.

Option 1 does not mitigate the overshooting due to the mismatch of durations between assets (when shorter) and liabilities (when longer)

## VOLATILITY ADJUSTMENT (14/26)
## ORIGINAL SETTING (2/14)

# Risk Corrected Spread

### Option 1

For the entity “I” and a portfolio in currency “c” [of the asset], option 1 is proposing:

$$VA_{i,c} = GAR * RC\_S_{i,c} * \min(MV_{i,c}^{FI} / BEL_{i,c}; 1) \qquad \text{(va11)}$$

Where “FI” denotes the reference to the fixed income government and corporate bonds.

Note that, entities investing in equity and property have a low ratio in the brackets.

This characteristic is desired by the Eiopa in designing option 1: it’s aimed to avoid the overshooting.

GAR was originally 65% (it might be changed in 85% consistently with the recent HIA assumption about AR4 and AR5)

The risk corrected spread has a different formula compared to that used in the HIA (as the latter is not entity specific)

## VOLATILITY ADJUSTMENT (15/26)
## ORIGINAL SETTING (3/14)

### Risk Corrected Spread — Option 1

For government and corporate bonds separately, the risk corrected spread is given by the (gross) spread multiplied (1-risk correction).

If the (gross) spread is negative, there is no risk correction. This entails the option 1 is not symmetric.

The level of granularity of the gross spread involves several dimensions and the aforementioned check must be carried out for each dimension without compensations:

- The currency “c”
- The duration bucket “d”
- For government bonds, the issuer country “g”
- For corporate bonds, the credit quality step “r”
- For corporate bonds, the distinction between financial and non – financial “f”

The % of risk correction would be supplied by Eiopa separately for government and corporate bonds. As for corporate bonds, there would be various risk correction according to the credit quality step.

First proposal: 30% CQS 0; 40% CQS 1; 50% CQS 2; 60% CQS 3 applicable above 3 as well.

Government bonds: 30% if EU issued in the own domestic currency; the same as corporate bonds otherwise

## VOLATILITY ADJUSTMENT (16/26)
## ORIGINAL SETTING (4/14)

# Risk Corrected Spread

### Option 1

The overall entity specific risk corrected spread is given by the following formulaic which expresses a weighted average:

$$RC\_S_{i,c} = \sum_{d,g} W_{d,g,i,c} * RC\_S^{gov}_{d,g,c} + \sum_{d,r,f} W_{d,r,f,i,c} * RC\_S^{corp}_{d,r,f,c} \qquad \text{(va12)}$$

Notes:

- No need to distinguish between assets covering and not covering technical provisions
- Government bonds spreads can be extracted by Bloomberg
- For each class of corporate bonds, the info about spreads are contained in the indexes currently used for the calculation of VA (Markit – iBoxx indices)

## VOLATILITY ADJUSTMENT (17/26)
## ORIGINAL SETTING (5/14)

### Risk Corrected Spread — Option 1

EIOPA is afraid that OPTION 1 could incentive the purchase of low credit fixed income investments in both corporate and, above all, in government bonds.

The risk, according Eiopa, is the advantage of an Entity / portfolio specific VA – which increases when fixed income assets are purchased, could overcome their contribution to the SCR: if so, the Solvency Ratio could increase.

In order to mitigate such risk, there are 2 sets of possible interventions to be introduced in Pillar II and Pillar III:

- ORSA requirement to provide analysis of change: Option 1 VA computed under the assumption the asset mix is the same as in the previous year
- ORSA explanation about the reasons the asset mix has changed with focus on changes of average credit quality of fixed income portfolio
- An update of risk management policy with assurance that the Management Body does not intend to invest in low credit quality assets with the purpose to raise the solvency ratio
- An additional [Pillar III] disclosure requirement with details about fixed income investments: by currency, credit quality, financial or non - financial (corporate bonds), issuer (government bonds) and duration (that is already currently foreseen)
- Explanation about why the asset allocation has changed with focus and changes of average credit quality
- An additional Supervisory power to impose, eventually, the calculation of VA – for the current balance sheet application – based on the previous year asset mix

## VOLATILITY ADJUSTMENT (18/26)
## ORIGINAL SETTING (6/14)

# Risk Corrected Spread

### Option 2

It's also known as "middle bucket approach" since it's in the middle between a portfolio qualified for the matching adjustment and the remainder portfolio of assets and liabilities.

The features and properties are milder than those required for the Matching Adjustment:

- Identification and separation of assets and liabilities from the remainder portfolios event though not necessarily ring fenced
- Only single premium contracts. Recurrent premiums permitted only if they do not meet any contract boundary (defined as qualifying future premiums)
- No exposure to lapse risk. Lapse risk shall not bite more than 5% (with the standard formula calibration) or the surrender value shall be ever lower than the corresponding value of assets.
- No unbundling of insurance components / obligations
- The expected cash flows of existing assets + future premiums replicate the corresponding cash flows liabilities with buckets 2 years wide till to the Last Liquid Point (currently 20 years for the €)
- Assets can be sold before obligations mature provided that they are replaced as long as the entity purchases similar assets

# VOLATILITY ADJUSTMENT (19/26)
# ORIGINAL SETTING (7/14)

## Option 3

Option 3 proposes a completely different solution, that is to modify the assets and the technical provisions instead of to modify the SCR.

- The assets are re-calculated by adjusting the credit spread through the VA (no mention to any particular method / option for setting this spread correction)
- With regard to participating contracts, re-calculation of stochastic FDB and TVOG, which update technical provisions.

That said, the own fund adjustment equates the net of taxes adjustment of assets less adjustment (only for participating contracts) of best estimates.

Note: the valuation of LAC DT (loss absorbency capacity of deferred taxes) should be done as if the option 3 would not be applicable → LAC DT should be independent and not affected by the application of option 3.

# VOLATILITY ADJUSTMENT (20/26)
# ORIGINAL SETTING (8/14)

## Option 6

Option 6 proposes a method for measuring the risk correction of corporate bonds (and government bonds other than non EU issued in their own currencies) which is meant to be alternative to option 1.

Note that the recent HIA has proposed a third alternative method.

The risk correction is simply 50% and is applicable to the last reported corporate spread.

Option 6 was intended to be used within Approach 1.

## Macro Prudential component of Volatility Adjustment

### Option 8

Option 8 proposes an alternative solution to the Country Specific VA, therefore it's not applicable together option 7.

It's also known as "Macro Economic" component of VA.

It could be used as an additional VA and only within Approach 1.

$$VA_{i,c}^{8} = VA_{i,c}^{perm;approach\ 1} + VA_{i,c}^{macro} \qquad \text{(va13)}$$

Where "I" and "c" stand for, respectively, undertaking and currency

$$VA_{i,c}^{macro} = GAR * AR_{i,c}^{macro} * \max(RCS_{jur(i)} - \overline{RCS}_{jur(i)}^{n} - c; 0) \qquad \text{(va14)}$$

Where "c" is the corridor set out (at its first glance) in 50 basis points and

$RCS_{jur(i)}$ ; $\overline{RCS}_{jur(i)}^{n}$

are risk corrected country spread for the jurisdiction of the undertaking "I", with reference, respectively, to the last reported and to the average over the last 36 months.

## Macro Prudential component of Volatility Adjustment

### Option 8

The application ratio is defined in a way to avoid the double counting with the application ratio of the permanent VA:

$$AR_{i,c}^{macro} = 1 - AR_{i,c}^{perm} \qquad \text{(val4a)}$$

Originally, Eiopa had proposed an alternative method for defining the macro – economic application ratio that is:

$$AR_{c}^{macro} = 1 - F_{I,L} - \frac{RCS_{jur}}{S_{jur}} \qquad \text{(val4b)}$$

That is 1 less the "spread allocated to the liquidity" in accordance to option 5 less the ratio between the "share of the country spread for the respective jurisdiction that is due to the risk – correction".

This method is consistent with the original setting of option 5 that is described in the next pages and is referred to as "approach A".

Before doing so, it's worth be noting that option 8 can be calculated with an alternative method (known as method 2)

## Macro Prudential component of Volatility Adjustment

### Option 8

Method 2:

$$VA_{i,c}^{macro} = GAR * AR_{i,c}^{macro**} * \max(S_{jur(i)} - \bar{S}_{jur(i)}^{n} - c; 0) \qquad \text{(va15)}$$

The risk corrected spreads used in formula va14 are replaced with the spreads in formula va15.

Moreover, $AR_{i,c}^{macro**}$

Could be set to 100% or could be set equal to the application ratio of the permanent VA

With formula (va15), formula (va13) can't be used: it's replaced by the following:

$$VA_{i,c}^{8} = \max(VA_{i,c}^{perm}; VA_{i,c}^{macro}) \qquad \text{(va13bis)}$$

# VOLATILITY ADJUSTMENT (24/26)
# ORIGINAL SETTING (12/14)

## Option 5. Original setting

The method used in the HIA was known as “approach B” which can be recognized through the feature of bucketing the portfolio in force. This has been described before as “AR5”

However, there exists a main “approach A” which is described below.

$$VA^5_{i,c} = \text{GAR} * AR^5_{i,c} * RC\_S_{i,c} \qquad \text{(va16)}$$

**Or, as alternative,**

$$VA^5_{i,c} = \text{GAR} * AR^5_{i,c} * S_{i,c} * F_{I,L} \qquad \text{(va16bis)}$$

Where F(I,L) denotes the share of spread that can be allocated to illiquidity

Where

$$AR^5_{i,c} = \min\left(1;\ \frac{PVBP^{CF}(ILL_{i,c})}{PVBP^{CF}(BEL_{i,c})}\right) \qquad \text{(va17)}$$

Note: the **option 5 application ratio might be greater than 100%** under this approach

The ratio is between two sensitivities of present values of cash flows. The term “PVBP” stands for sensitivity.

Sensitivities are meant in respect to change of interest rates by 1 basis point. Interest rates are the Eiopa RFR being used for Solvency II (before any VA)

The denominator represents all the cash flows used for assessing the best estimate whereas the numerator represents the “illiquid cash flows” described in the next page.

# VOLATILITY ADJUSTMENT (25/26)
# ORIGINAL SETTING (13/14)

## Option 5. Original setting

The numerator represents the “illiquid cash flows.

This can be achieved as results of 4 steps procedure:

Step 1: to define the sensitivity of the best estimate in respect to (1) mass lapse as well as (for life business) (2) lapse up, (3) mortality. The shock parameters are those used for the standard formula. Sensitivities are performed at time zero, the reporting date.

Step 2: to define the available funds for each scenario $j = \{0; 1; 2; 3\}$ (j=0 stands for base best estimate before shock) with a recurrent formula which use eiopa risk free interest rates “r(t)” and the cash flows of each future year.

Note that those cash flows depend on the particular scenario.

$$AvFunds_{j,t} = (AvFunds_{j,t-1} * (1 + r_t) - CF_{j,t}) \qquad \text{(va18a)}$$

Step 3: to identify the minimum Available own funds for every time t. As for t=0, it’s assumed to be that corresponding to scenario zero

- $MinAvFunds_{j,0} = AvFunds_{0,0}$ (va18a1)
- $MinAvFunds_{j,t>0} = \min(AvFunds_{0,t-1}; AvFunds_{1,t-1}; AvFunds_{2,t-1}; AvFunds_{3,t-1}) * (1 + r_t)$ (va18a2)

## VOLATILITY ADJUSTMENT (26/26)
## ORIGINAL SETTING (14/14)

### Option 5. Original setting

Step 4: $ILL_t = MinAvFunds_t - {}^{MinAvFunds_{t+1}}/_{(1+r_t)}$ (va18)

**Option 5 rewards countries with long term liabilities and penalises the Italian market.**

Unlike during the first data call, the HIA option 5 (i.e. AR5) cannot exceed 100%

### Combined Options 4 and 5

Whilst in the HIA options 4 and 5 are combined via the product, in contrast they were compared each other in the original setting and the least one prevailed

## VOLATILITY ADJUSTMENT. LAST ADVICE

**Option 7 becomes consistent with approach 1.**

VA is advised to be the sum of country specific VA (option 7) and the permanent VA, relevant to the country "I"

Compared to the previous formulaic:

- Option 7 is called "macro VA".
- The application ratio are given by options 4 and 5
- Introduction of country specific scale factor scale(i)

$$VA_{macro;i} = GAR * AR_i^4 * AR_i^5 * w_i * MAX[0; (RCS_i * scale_i - 1.3 * RCS * scale)]$$

# INTEREST RATE RISK VS SPREAD RISK CORRELATIONS (1/4)

**HIA accepted to test a lower correlation between the interest rate risk down and the spread risk**

Current SF: + 0.50

Proposal: + 0.25

- There's evidence of an even more important decline of correlation between interest rate risk down and spread risk.
- There's also evidence of a decline of correlation between interest rate risk up and spread risk, to the extent that it has become negative.
- The fact that in a low yield environment the correlations with spreads have decreased may be due to the decline of cost of funding

HIA test has demonstrated the materiality of impact of the new proposal, limited to the interest rate risk down.

It's able to mitigate at least 50% of the new formula for the calculation of gross of diversification interest rate risk (down).

The new of diversification risk is halved thanks to the lower correlation.

# INTEREST RATE RISK VS SPREAD RISK CORRELATIONS (2/4)

**HIA accepted to test a lower correlation between the interest rate risk down and the spread risk**

The correlations between the decrease in interest rates and the increase in spreads was on average +0.02 (against +0.50 of the SF) meaning in practice independence.

Creditworthiness indicators (Itraxx) for various segments of the EU corporate bond market.

The series covers 12 months and refers to the period December 2018 - November 2019.

Reference: the Swap rate at 5Y as it is consistent with the average duration of the underlying assets to the Itraxx indices.

The following are the specifications relating to the Itraxx indexes:

- iTraxx Crossover: 75 Most Liquid High Yield corporate Credit Default Swaps (average B + rating);
- Main Europe: 125 Most Liquid Investment Grade corporate Credit Default Swaps (average rating BBB +);
- Senior Financials: 30 Senior Credit Default Swaps for Banks (average rating A-);
- Subordinated Financials: 30 Subordinated Credit Default Swaps for Banks (average BBB rating)

# INTEREST RATE RISK VS SPREAD RISK CORRELATIONS (3/4)

## HIA accepted to test a lower correlation between the interest rate risk down and the spread risk

a. Itraxx Crossover

Interest rates go up

| | Δ Cross | Δ int_rate | Cross&Int_rate |
|---|---|---|---|
| mean | - 2,210 | 1,486 | |
| variance | 41,407 | 1,801 | |
| mean square error | 6,435 | 1,342 | |
| covariance | | | - 2,291 |
| correlation | | | -26,53% |
| check | | | OK |

Interest rates go down

| | Δ Cross | Δ Int_rate | Cross&Int_rate |
|---|---|---|---|
| mean | 0,908 | - 1,454 | |
| variance | 43,735 | 1,802 | |
| mean square error | 6,613 | 1,342 | |
| covariance | | | - 0,629 |
| correlation | | | -7,09% |
| check | | | OK |

a. Main Europe

Interest rates go up

| | Δ Main | Δ int_rate | Main&Int_rate |
|---|---|---|---|
| mean | - 0,576 | 1,486 | |
| variance | 2,945 | 1,801 | |
| mean square error | 1,716 | 1,342 | |
| covariance | | | - 0,824 |
| correlation | | | -35,78% |
| check | | | OK |

Interest rates go down

| | Δ Main | Δ Int_rate | Main&Int_rate |
|---|---|---|---|
| mean | 0,201 | - 1,454 | |
| variance | 3,460 | 1,802 | |
| mean square error | 1,860 | 1,342 | |
| covariance | | | 0,050 |
| correlation | | | 2,02% |
| check | | | OK |

# INTEREST RATE RISK VS SPREAD RISK CORRELATIONS (4/4)

## HIA accepted to test a lower correlation between the interest rate risk down and the spread risk

a. Senior Financials

Interest rates go up

| | Δ Sen Fin | Δ int_rate | SenFin&Int_rate |
|---|---|---|---|
| mean | - 0,853 | 1,486 | |
| variance | 5,135 | 1,801 | |
| mean square error | 2,266 | 1,342 | |
| covariance | | | - 0,933 |
| correlation | | | -30,67% |
| check | | | OK |

Interest rates go down

| | Δ Sen Fin | Δ Int_rate | SenFin&Int_rate |
|---|---|---|---|
| mean | 0,306 | - 1,454 | |
| variance | 6,766 | 1,802 | |
| mean square error | 2,601 | 1,342 | |
| covariance | | | 0,192 |
| correlation | | | 5,49% |
| check | | | OK |

a. Subordinated Financials

Interest rates go up

| | Δ Sub Fin | Δ int_rate | SubFin&Int_rate |
|---|---|---|---|
| mean | - 1,650 | 1,486 | |
| variance | 25,018 | 1,801 | |
| mean square error | 5,002 | 1,342 | |
| covariance | | | - 2,284 |
| correlation | | | -34,02% |
| check | | | OK |

Interest rates go down

| | Δ Sub Fin | Δ Int_rate | SubFin&Int_rate |
|---|---|---|---|
| mean | 0,592 | - 1,454 | |
| variance | 26,554 | 1,802 | |
| mean square error | 5,153 | 1,342 | |
| covariance | | | 0,705 |
| correlation | | | 10,20% |
| check | | | OK |

## Undertaking Specific VA (also known as Own Assets VA)

This is a feature of option 1.

- An Own Assets VA calculated with a sufficient level of granularity, would significantly reduce part of the basis risk inherent in the current design of the VA. It is however crucial that sufficient level of granularity in asset class modelling is present in order to make this option work as well as a company-specific VA.
- It should also be recognised that a company/entity-specific VA and these additional safeguards would increase the operational burden for all VA users and add complexity compared to the current representative portfolio VA. This would only be justified if it would be accompanied by significant benefits in terms of the current prudent level of the VA and would materially reduce basis risk.

# USAGE OF LONG TERM MEASURES (RESTRICTIONS AND DUTIES)

## Volatility Adjustment

EIOPA would like to introduce mechanism for restricting the distribution of dividends in case the Solvency Ratio – calculated without VA – would be lower than 100%

This would protect the rights of policyholders

## Transitional Measures

Eiopa is not happy about the transitional measures on technical provisions. Thus, Eiopa intends to require additional disclosures on SFCR, quantitative impact measurements, description of dependency on that transitional.

## TECHNICAL PROVISIONS

Amendments or manual which clarify issues about technical provisions will touch

(1) Economic scenario generators

(2) EPIFP

(3) Definition of contract boundaries,

(4) Expenses allowed for in the best estimate, investment management expenses and inflation rate

(5) Management actions in stochastic runs

(6) Stronger allowance for PHB, dynamic policyholder behaviour, than nowadays above all for bidirectional PHB in order to strengthen to cost of guarantees. Portfolios exposed to lapse down have best estimates underestimated by fault of PHB as entities are currently used to model it

(7) Homogeneous Risk Groups

## ESG(S): ECONOMIC SCENARIO GENERATORS

Stochastic runs in respect to the interest rates are necessary when the best estimates supply options and guarantees.

That's the case, for example, of continental participating contracts

Scenarios of interest rates shall be risk free market consistent where real world assumptions are forbidden (just for the aim of best estimates evaluation).

ESG must be calibrated with those features:

(1) Be Based on Eiopa setting of risk free rates

(2) Fit for replicating option prices [test of martingale]

Given this playing field, the "issue" consists in the impossibility to replicate also the implied volatilities which sometime becomes more important than replicating option prices.

Another secondary issue consists in the discretionary choice of the portfolio of assets to replicate in terms of option prices.

At last, other issues relate to (1) some jurisdictions replicate also the VA or the Matching Adjustment, (2) some entities have been using external providers which in turn can't provide entity specific ESGs.

All these were under discussion.

However, the stance of EIOPA is for NOT amending anything; Just an additional guidance about outsourcing might be introduced.

## ESG(S). FINAL ADVICE

Neither the main document nor the analysis document provides clear advice about ESGs despite the phase of discussion had anticipated need of a strong advice.

- Annex 5 reports just some statistical evidence: stochastic runs are used from 0% to 100% of the undertakings, varying by country and, when applicable, covers 58% of best estimates.
- 100% is true in 5 countries: Italy, France, Norway, Netherlands, Czech Republic. Note that UK undertakings are not in the sample.
- When applicable, stochastic results are 0.8% higher than deterministic runs; the impact on SCR is 3 times higher than the impact on the own funds.

Annex 3 tells about some problems due to:

- Sometime the Undertaking has not skills for generating internally the ESGs so that to ask for the service to external providers.
- ESG must be calibrated with those features:
  - be Based on Eiopa setting of risk - free rates
  - fit for replicating option prices [test of martingale]
- Given this playing field, the “issue” consists in the impossibility to replicate also the implied volatilities which sometime becomes more important than replicating option prices.
- Another secondary issue consists in the discretionary choice of the portfolio of assets to replicate in terms of option prices. EIOPA says that the calibration based on entity specific set of maturities is justifiable

## EPIFP (EXPECTED PROFITS INCLUDED IN FUTURE PREMIUMS)

# EIOPA proposal on that a HRG may only contain profit- or loss-making policies, irrespective of the underlying risks.

The current way for calculating EPIFP allows for offsetting negative against positive values given by different insurance contracts as long as they belong to the same line of business (LoB, HRG).

Eiopa would like to separate profitable from onerous contracts in order to let only profitable contracts contribute to EPIFP. In such a way, showing a higher EPIFP, the Eiopa has – as further step - the possibility to restrict the eligibility of EPIFP to cover the SCR or to require a capital add – on.

EPIFP should - for supervisory purposes - be split into the group of loss-making contracts and the group of profit-making contracts (per line of business) with the impact of reinsurance shown separately

Such information does not change the EPIFP's nature as a component of the reconciliation reserve.

- Implementing this EIOPA proposal would require the whole restructuring of HRG and model points in firms' systems for this sole calculation, let alone the fact that the concept of profitable/unprofitable HRG is hardly practicable when stochastic valuation methods are used
- Whether HRGs are profitable or unprofitable is an output of the BEL calculation. As such, changing eg market conditions at each valuation date may change the allocation of policies, resulting in more volatile and unpredictable EPIFP figures

## DISCUSSION ON CONTRACT BOUNDARIES (1/4)

### PAID IN vs Future Premiums

- Eiopa has in mind to prohibit the recognition of contracts boundaries for options stemming from past premiums (i.e. paid in premiums).

If so, options in annuity and options to extend the maturity date might be split out in two components:

- the component(s) proportional to future premiums could be outside the scope of best estimate if contract boundary is applicable whereas
- the component(s) proportional to past premiums are recognized in the best estimate even though the insurer's treatment is the same as for future premiums.

### Individual vs Collective re-pricing

- Proposed amendments / clarifications about the condition when contract boundary on future premiums can be assessed

1) If pricing is individual, at level o single head insured (i.e. depends on age, duration, gender is this factor is significant), then the possibility to amend the premium to reflect change of risk shall be possible at individual level. If so, the premium could meet contract boundary
2) If pricing is individual and the possibility to amend the premium is at level of group of contracts, then the premium does not meet contract boundary
3) If pricing is at level of group and the possibility to amend the premium is at level of group [with no lower granularity], that premium could meet contract boundary

## DISCUSSION ON CONTRACT BOUNDARIES (2/4)

### Dynamic Assessment & Discernible Effect

- Dynamic assessment stands for refreshing the conditions of contract boundaries for future events at every reporting date

Eiopa clarifies that:

There's no need to amend Regulation as this is already clear

There's no need to increase the frequency of the update [quarterly is enough]

- Discernible effect means that if the contract boundary was previously due to the lack of economic impact on the P&L / Solvency ratio of the entity, the check on whether this is yet true must be refreshed.

There's no clarity about the frequency of the check about the discernible effect.

Eiopa suggests to release guidance on this issue.

## DISCUSSION ON CONTRACT BOUNDARIES (3/4)

### Horizon of projection

- The fact that some future premiums falling T years after the valuation date meet contract boundary does not entail that
  - all the cash flows stemming from past premiums won't be projected beyond T
  - Options and guarantees for events beyond T years won't be projected and included in the point in time best estimate

EIOPA advices the need to more guidance on this issue

### Unbundling

- Unbundling could create situations where contract boundaries are applied differently in the various components of the contracts once unbundled
- Therefore, EIOPA specifies that the current Solvency II rules about unbundling are sufficient clear and even aligned with IFRS17 on that:
  - Unbundling needs its components can be sold separately in the insurance market (even though one of them not by insurance entities)
  - Unbundling needs the different components can follow different paths, for example one can be surrendered whereas the others can remain alive
  - Unbundling needs [reserve] evaluation of different components can be done independently with the same result as they were aggregated

EIOPA advices the need to more guidance on this issue

## DISCUSSION ON CONTRACT BOUNDARIES (4/4)

### Dependency of cash flows of different components of contracts

- When a mortality cover is feed with loadings of a saving component:
  - Either through fees from the policyholder account value of the saving components (that might be the case when the contract is at single premium)
  - Or by setting which part of the recurrent premium flows to the policyholder account value and which part to the mortality cover (premium for risk)

Let us assume that the quantification of those loadings are potentially recurrently refreshable by the insurer.

The question is whether the risk component has a boundary of time H (H>0) where H is the length of period of insurer's update.

EIOPA is in favour of boundary of time H even though the saving component had a long term coverage (and boundary at maturity)

EIOPA advices the need to more guidance on this issue

## FINAL ADVICE. CONTRACT BOUNDARIES & EPIFP

The best estimates and the risk margin reflect future premiums and the relevant obligations and expenses until the undertaking has the unilateral right to amend (even though only potentially) those premiums.

That's the rule currently in force.

Eiopa noted that the best estimates of those future premiums (EPIFP) are negative – because underlying contracts are profitable - and represent a significant amount of own funds.

Moreover, some entities have interpreted the word "unilateral right" in such a way to make contract boundary not applicable with the consequence to overestimate the (negative amount of) EPIFP.

Therefore, Eiopa suggests to clarify in the regulation that EPIFP is not permitted (i.e. contract boundary might be met) when future premiums are susceptible to be amended at individual level.

EPIFP would then continue to be admitted if the amendment, either is not legally feasible or is feasible only at a level less granular than individual, for example at group level. Not feasible includes the technical constraint in doing an individual change.

Individual means that the premium rates depend on age and duration; gender is not in scope because forbidden in EU.

Note that during the discussion phase, Eiopa suggested to clarify as well as that EPIFP is not permitted if premium rates are assessed at group level and could be amended at group level. I think this rule is still valid.

More in general, EPIFP is not permitted in case the reassessment of premium rates is feasible with same or higher granularity than originally (or previously) stated.

## FINAL ADVICE. HRG & EPIFP (1/2)

The current mechanism enables undertakings to offset profitable contracts – whose EPIFP is negative, with loss making contracts – whose EPIFP is represented by a positive best estimate.

Offsetting is admitted provided that contracts belong to the same HRG, Homogeneous Risk Group.

During the recent discussion phase, EIOPA thought to separate loss making from profitable contracts, then set to zero the EPIFP of loss - making contracts.

In doing so, offsetting would not be permitted anymore and the overall amount of EPIFP disclosed would become the highest.

If, at the same time, EIOPA would have proposed to amend the Regulation in such a way to restrict the amount of EPIFP recognized as own funds or the reclassification of EPIFP (from tier 1) to tier 3, then the impact for the undertaking would have been significantly adverse.

## FINAL ADVICE. HRG & EPIFP (2/2)

Eiopa last stance is not clear:

- Its document with the extended analysis says two opposite things: (1) “splitting profit – making from loss - making contracts into different HRG would not reflect how the business is actually managed. Suddenly after EIOPA says the opposite, (2) that the same HRG can’t comprise by definition profit – making and loss – making contracts, hence loss - making contracts need to be separated.

- The final advice says that profit making and loss making should be treated separately, i.e. they belong to detached HRGs; however, the overall undertaking EPIFP shall recognize the non – zeroized contribution of loss making HRG.
- At last, inside a different section, EIOPA definitively advices to keep EPIFP as tier 1 and hence for its full recognition as own funds

## FINAL ADVICE. EPIFP AND RECOGNITION OF REINSURANCE; (NO) RECOGNITION OF DEFERRED TAXES

Eiopa last stance is for continuing to define EPIFP as gross of deferred taxes.

- It also prefers to assess EPIFP as net of reinsurance, any way there's no need of a separate disclosure of reinsurance impact.

## FINAL ADVICE. EPIFP AND RECOGNITION OF EXPECTED MANAGEMENT FEES

To recognize the expected present value of future management fees into the EPIFP is the strong advice of EIOPA.

- Since EPIFP of future premiums comprises already the relevant management fees, the new requirement would refer to only future fees generated by past premiums.
- It's not clear, however, whether they should be meant as gross rather than as net of the part distributed to external parties, for example as recurrent commissions.
- I think they should be net of fees distributed (i.e. fees retained) for consistency with the fact the fees implicit in future premiums perform as net amounts.
- Participating contracts would be exempted: the EIOPA advice is applicable to only unit linked [including the hybrid component] and index linked.
- It's not clear whether the test about loss making contracts should allow for the expected management fees.
- For the sake of simplicity, the calculation is meant to be gross of reinsurance, if any

## DISCUSSION ON CHANGES OF MANAGEMENT ACTIONS IN STOCHASTIC RUN

- Best estimate valuation in life insurance with a stochastic model includes various management actions. These are necessary components of models.

An option under discussion (unlikely) is whether these models for Future Management Actions (FMA) could be linked to the business plans.

- FMA work “under specific circumstances” that is, in stochastic valuation, specific FMA can be implemented in specific scenarios.
- FMA should not be challenged against past because some FMAs can be taken in very specific circumstances which have not yet occurred in the past. FMAs should reflect the potential actions that the Board may take in the future.

## FINAL ADVICE. FUTURE MANAGEMENT ACTIONS (FMA)

- The question is whether FMA foreseen in the “undertaking plan” should not be considered any longer as FMA according to the definition of art 23 of EU Regulation.
- If so, they could not be used any more in the net scenario (i.e.in the calculation of loss absorbency capacity of technical provisions), rather they belong to the perimeter of best estimates before any kind of stress.

The last stance of Eiopa is for amending the Regulation in order to make clear that any prevision made inside the undertaking plan does not prejudice the meaning of FMA. Thus, any FMA which reacts to stress factors can be used in the net scenario even though it’s or it was already a prevision found in the undertaking plan

## DISCUSSION ON ALLOWANCE FOR EXPENSES

- EIOPA has identified remarkable differences on the assumptions on new business for expenses allocation during cash flow projection. According to Article 31(4) of the Delegated Regulation, expenses shall be projected assuming that new business will be written. However, in some cases it has been considered that this assumption is not adequate, for example where the undertaking is not writing any new business. In cases like this one, sometimes realistic assumptions on new business have been used to allocate expenses.
- New business, meaning business outside the contract boundaries, is not included in the projection of cash flows for best estimate valuation. However, assumptions on new business have an indirect impact on best estimate valuation, for example through the allocation of expenses.
- EIOPA advices to amend the second paragraph of Article 31(1) of the Delegated Regulation as follows: "The expenses referred to in points (a) to (d) shall take into account overhead expenses ~~incurred~~ to be incurred in servicing insurance and reinsurance obligations".
- "Expenses shall be projected taking into account the decisions of the administrative, management or supervisory body of the undertaking with respect to writing new business"

## DISCUSSION ON ALLOWANCE FOR INVESTMENT MANAGEMENT EXPENSES AND INFLATION RATE

- Allowance for investment management expenses are often proportional to the reserves

The question is what are the basis for the reserves?

Local GAAP (they are seldom negative)

Solvency 2

Another question is whether they have to make references only to investment backing those reserves or have to be wider

EIOPA advice is for using Solvency II as basis and for making references to assets backing those provisions + SCR.

As alternative, all the assets of the entity, i.e. all the investment expenses should be included in best estimates future cash outflows.

- Inflation assumptions

EIOPA suggests to supply more guidance about the process to derive inflation rates. It intends to harmonize different practises between insurers

## FINAL ADVICE. EXPENSES. ASSUMPTIONS ABOUT FUTURE NEW BUSINESS AND LINK WITH HISTORICAL EXPERIENCE

- The first problem is whether the allocation of recurrent expenses, such as claims, investment related and overhead, should consider the arrival of new business in future years and, if so, whether this is mandatory (hard going concern) or depending on the undertaking plan (soft going concern).

Eiopa will clarify in the Regulation that recurrent expenses should reflect future new business; however, it will be based on a soft going concern.

- In doing so, if the management body deems not realistic the arrival of new business as in past years, the recurrent expenses would be more allocated to the portfolio in force, hence pushing up the level of best estimate.

- The second concern relates to the strict link between the historical reported expenses and future expenses.

Eiopa has in mind to weaken the link between assumptions about the future and historical experience, so that to enhance the consistency with future expectations and assumptions regardless the past experience.

## DISCUSSION ON DYNAMIC POLICYHOLDER BEHAVIOUR (PHB)

- Eiopa proposes to provide further guidance on the calibration of dynamic models and to clarify that the lack of data for extreme scenarios is not a reason itself for not to model dynamic PH behaviour.

In some jurisdictions modelling dynamic lapses is the default in life insurance. The models are widely accepted unless it is hard to calibrate them on historic data. Their calibration relies mostly on expert judgement.

- There's a proposal to let the reduction of lapse rates more significant than in the current model

The current models are used to allow only for growing lapse rates and not also for their decline by fault of opposite circumstances.

The not – allowance for risk of declining lapse rates might imply an underestimation of the technical provisions.

## FINAL ADVICE. DYNAMIC POLICYHOLDER BEHAVIOUR (1/3)

The absence of any EIOPA suggestions in the main document is misleading: EIOPA is proposing to deliver guidance aimed to rule the PHB modelling, any way without touching the Regulation.

- PHB is currently used by only less than 40% of the EU undertakings, varying by country from 0% to 75%. The remainder undertakings have been using only “static” approach (i.e. non - dynamic).
- PHB, when applied, covers 75% of portfolio on average and, surprisingly, where applicable, its impact on best estimates range only between 0.05% and 0.3%.

PHB entails modelling of the economic factors conditioning lapses and other abandons.

- Other factors may affect the frequencies such as age, gender and time last from inception; however, the reference to dynamic behaviour is meant only in respect to economic factors.

- Many undertakings claim PHB can’t be unbundled with ease from other components affecting the historical frequencies; thus, the usage o PHB entails a double counting of the underpinning factors.

## FINAL ADVICE. DYNAMIC POLICYHOLDER BEHAVIOUR (2/3)

That's the main reason justifying undertakings have not applied so far PHB.

- Other justifications are the intervention of the national supervisor which imposes its own simplified solution or is not interested at all about PHB.
- The lack of materiality, mentioned above, is another good justification if compared to the efforts needed for analysing past experience, although art. 26 of Delegated Regulation would permit the static solution when the dynamic one is impracticable.

EIOPA opinion is that low materiality and effort in data analysis cannot be used as justification.

## FINAL ADVICE. DYNAMIC POLICYHOLDER BEHAVIOUR (3/3)

- It's worth noting that the analysis document does mention only in the annex (annex 5) the concern about the current PHB is rarely symmetric (bidirectional) i.e., when applied, it increases frequencies under extreme scenarios but never decreases frequencies under opposite extreme scenarios. During the discussion phase, this was reputed an important concern in respect of onerous contracts whose best estimate are then underestimated.

- Annex 5 says that, if we consider that PHB is used during stochastic runs i.e. not only during deterministic runs, the lack of symmetrical feature may represent a concern. However, the word "materiality" is never used.
- Nevertheless, EIOPA notes that all the NCAs agree on that PHB should be bidirectional instead of unidirectional without any way suggesting for single NCA initiatives.

## TVOG SIMPLIFICATION. LRU ENTITIES. PHRSS TEST (1/3)

This part is contained in the section of proportionality, separated from the rest of proposals about technical provisions.

- 16% of entities could have the properties needed to be qualified as “low profile” whose acronym is **LRU** which stands for Low Risk Undertakings**.**
- Their life business covers 0.53% of life market share whereas their GI business 1.8% of non – life one.
- A LRU entity might be eligible for a simplified calculation of TVOG, that is almost deterministic.
- Such a simplified TVOG would be achieved by running 10 scenarios provided by EIOPA, whose acronym is **PHRSS**. The condition is that the simplified method does not exceed 5% of the overall SCR.
- EIOPA explains why the reference is to be the Net SCR rather than the best estimate.
- Entities other than LRU might apply the simplification as well, provided that they ask for and achieve NSA approval. If so, the “additional stochastic TVOG” equals exactly 5% of SCR (this is valid for non – LRU entities).

## TVOG SIMPLIFICATION. LRU ENTITIES. PHRSS TEST (2/3)

To be considered a LRU entity, 9 conditions must be satisfied by the legal entity.

- They are: (1) it must not be the head of a Group, (2) Life technical provisions must be below 1 € billion (and GI written premium below 0.1 € billion); (3) it shall not be a pure reinsurer. Less than 50% of gross premiums from accepted reinsurance; (4) average returns of assets backing life liabilities other than unit linked must be above average minimum guarantees / technical rates; GI combined ratio <100%; (5): complex investments other than unit linked <20%. Non – complex investments are only bonds, equities, cash and deposits; (6) GI entities shall have LOBs Marine, Aviation, Transport + Credit & Suretyship < 30% of gross written premiums; (7) less than 5% of premiums can be gathered outside their own jurisdiction; (8) Standard Formula users, no usage of full or partial internal model; (9) SCR interest rate risk < 5% of overall technical provisions.
- All the conditions must be fulfilled for at least 2 consecutive years.

## TVOG SIMPLIFICATION. LRU ENTITIES. PHRSS TEST (3/3)

EIOPA believes that 25% of life undertakings have their TVOG < 5% SCR; however, it has not acquaintance on how many LRU satisfy the condition.

- The test under PHRSS should avoid loop and the complex relationship with future discretionary benefits.
- Thus, the LAC TP must not be affected by the 10 PHRSS for the calculation of net SCR.
- Moreover, the PHRSS shall not change the FDB (i.e. that used for balance sheet best estimate, before shock).

- A LRU entity whose PHRSS TVOG is lower than 5% net SCR may later lose either the LRU or the PHRSS test. If so, it keeps the simplification for other 2 years insofar as 1 out of 2 conditions continue to be met.

## HOMOGENEOUS RISK GROUPS (HRG)

HRG should be meant as clusters which share the non – economic assumptions as well as economic assumptions on the basis they have similar characteristics in respect to:

- Exposure to the underwriting risks
- Financial guarantees, if any
- Future management actions
- Future expenses
- Underwriting policy
- Claims settlement patterns (GI)

The question is on whether the classification (1) could be different or (2) should be the same when clusters have different aims, i.e.

- Recognition of the EPIFP
- Definition of model points to be used for stochastic scenarios

EIOPA has not any particular stance so far

## REFUSAL OF AMENDING THE RECOGNITION OF NON – PROPORTIONAL REINSURANCE AND FINITE REINSURANCE

- The current formula allows for 20% reduction of reserve risks for the GI LOB 1,4 and 5.
- Stakeholders have asked to allow for non – proportional reinsurance and tested a formula in the Holistic Impact Assessment of Spring 2020 which would have resulted in a hoped reduction of both premium and reserve risks.
- The outcomes have been adverse, since Eiopa noted that the formula has provided an unintended increase of SCR instead of a reduction that, at last, could be due to the complexity of formula & solution. Thus, Eiopa suggests to not change the current simple way of recognition.

## RECOGNITION OF GI ADC. REINSURANCE OF ADVERSE DEVELOPMENT COVER (1/2)

This kind of reinsurance covers the adverse development factors as of the evaluation date. It covers the not sufficiency of the current outstanding claim liability for the claims incurred as of the evaluation date.

Eiopa is now open to partially recognize its risk mitigation in relation to net reserves exposed by € L – thereof € LR covered by ADC, whose contribution to reserve risk is A>0; given x <100% the share ceded to reinsurance, the adjustment factor is achieved by the following:

$$adjustment\ factor = \frac{A - (B - C) * x * E}{A}$$

The lower is the “adjustment factor”, the higher the mitigation.

E is a prudent factor, set initially to 100% and refreshed every 2 years.

C is an additional reinsurance premium.

## RECOGNITION OF GI ADC. REINSURANCE OF ADVERSE DEVELOPMENT COVER (2/2)

B is the recovery under the reserve risk scenario. It's computed with the following equation, with a lower bound given by the "reinsurance structure cover size":

$$B = LR * \left(1 + 3\sigma(res; s)\right) - attachment\ point$$

Eiopa wants in any case introduce limitations to both attachment and detachment points: the former should not exceed (1+σ) best estimates; furthermore, no recognition of multi - line covers: recognition of ADC covering just 1 specific group of policies with the same characteristics within the same segment, unless they are not provided by the same contract.

## OWN FUND BUFFER (1/2)

Last advice does not support any longer the introduction of Own Fund Buffer

The European Systemic Risk Board (ESRB) launched the idea that when the credit spread in a country becomes lower compared to the historical average, this favour event should enact a prudent buffer in the own funds: own funds would be temporary restricted (or negative adjusted). The National Supervisor Authority (NSA) would have the duty to define the adjustment for the local insurance undertakings.

- Whether or not such a prudent measure is applicable would be under the discretion of the NSA. If so, the upper limit of the restriction is to be calculated with an objective procedure that is shown below:

1. To select the portfolio of assets: only fixed income assets other than those held in units – irrespective of they cover or not insurance liabilities - and excluding assets subject to the matching adjustment.
2. To calculate twice their market value, as shown below FIP and $FIP^*$ > FIP
3. To define the [max] negative adjustment as difference

$$FIP^* - FIP = OBF \ (where \ OBF \geq 0)$$

## OWN FUND BUFFER (2/2)

FIP, the market value of assets is known. Second step starts with the definition of one single constant interest rate "AER" as solution of the following equation:

$$FIP = \sum_{t=1}^{N} \frac{cashflow_t}{(1+AER)^t}$$

$FIP^*$ is then calculated by adding a negative adjustment to AER that is provided by EIOPA: it's worth -0.13% at FY2019 "t" for Italy and depends (i.e. varies with) on the country

$$FIP^* = \sum_{k=t+1}^{N} \frac{cashflow_k}{(1+AER+NSA)^{(k-t)}}$$

Where $NSA_t = 35\%(CS_t - Av(CS)_{(t-7,\dots,t)})$

The credit spread CS(t) at time t is calculated as the difference between the yield of the assets and the basic risk-free interest rate term structure. There's no risk correction applicable to the credit spread.

AV(CS; t-7,…,t) corresponds to the 7-years average of the credit spread.