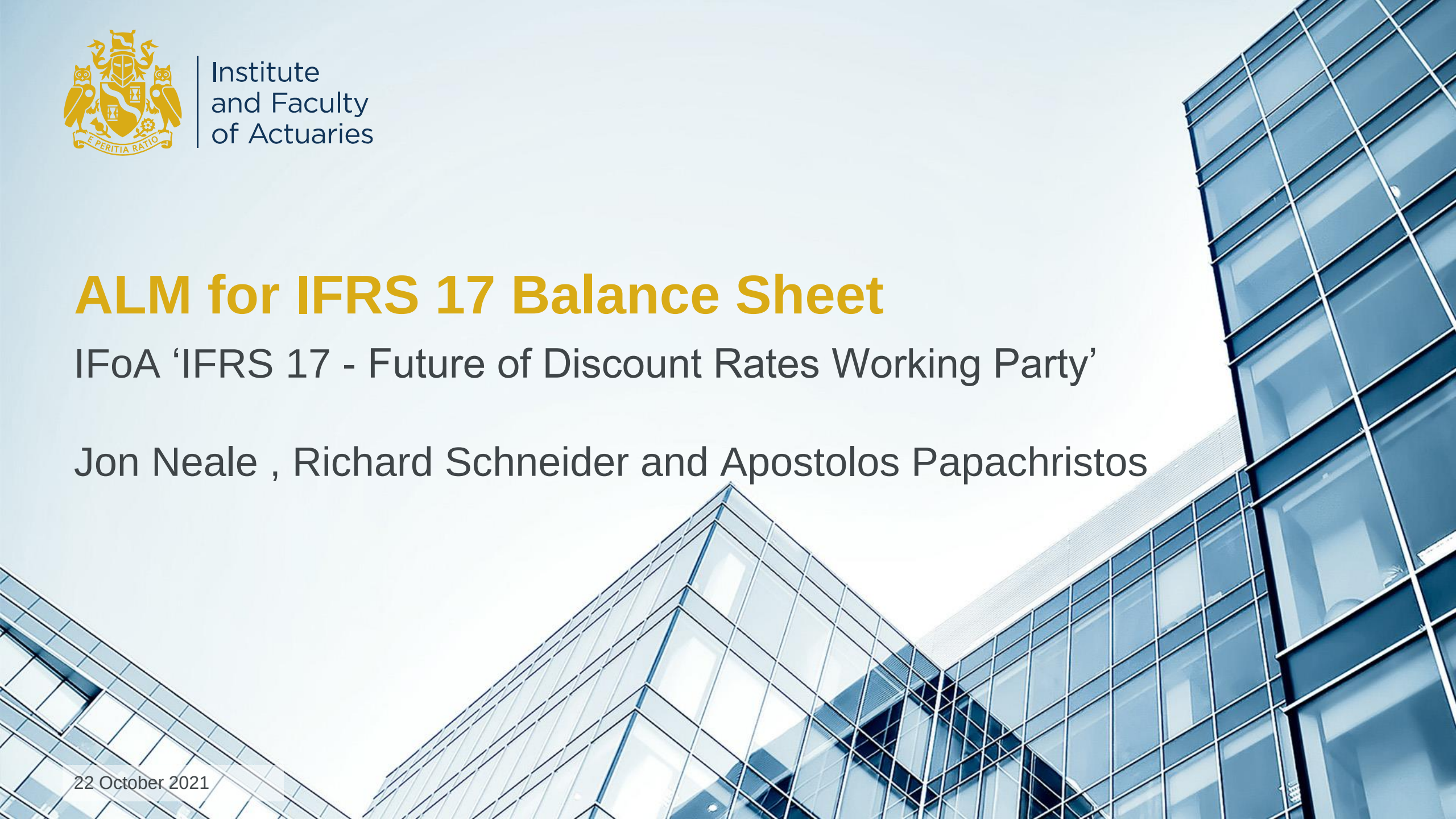

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ALM for IFRS 17 Balance Sheet

IFoA ‘IFRS 17 - Future of Discount Rates Working Party’

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22 October 2021

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Agenda

1. Introduction to IFRS 17 discount rates and ALM
   - Definition and Objectives of ALM
   - General Measurement Model - Approaches to estimate IFRS 17 discount rates
   - Key decisions on the methodology and implications for ALM
   - Basic comparison of Solvency II and IFRS 17 discount rates
   - Sensitivities and sources of asset-liability mismatch
2. Annuity specific considerations
3. With-profits specific considerations

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Definition and Objectives of ALM

Asset Liability Management is the ongoing process of formulating, implementing, monitoring, and revising strategies related to assets and liabilities to achieve financial objectives, for a given set of risk tolerances and constraints.

(Principles Underlying Asset Liability Management © 2004 Society of Actuaries)

Main objectives are: (1) To protect value of own funds against changes in interest rates - or more broadly - changes in asset values; (2) To influence investment strategies to achieve financial objectives, through 'risk – reward' optimisation

Various metrics could be used for hedging market risks. This presentation focuses on sources of volatility and mismatch under IFRS 17.

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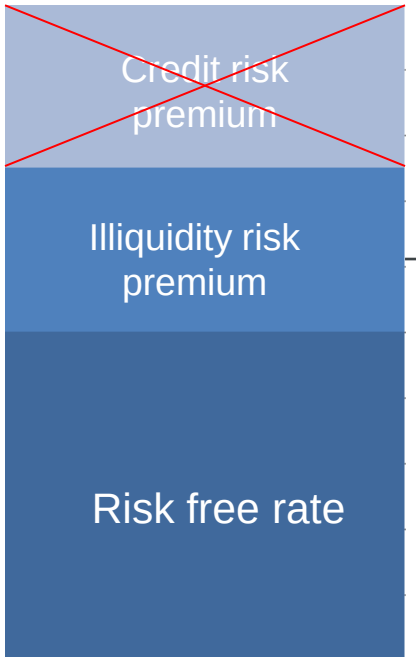
General Measurement Model - Approaches to determine IFRS 17 discount rates : Top-down vs. bottom-up

Top-down: remove credit risk from the yield to maturity

Bottom-up: add illiquidity risk premium to risk free rate

Yield to maturity <u>minus</u> credit risk premium, based on reference portfolio



The Illiquidity risk premium reflects the illiquidity of **liabilities**.

Challenges:

- Assets to include in reference portfolio
- Calculation of credit risk and illiquidity risk premiums

Risk free rate <u>and</u> illiquidity risk premium, based on reference portfolio

More details on the two approaches are available on 'IFRS 17: Future of Discount Rates Working Party' website: https://www.actuaries.org.uk/practice-areas/life/research-working-parties/ifrs-17-future-discount-rates

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Key decisions on the methodology and implications for ALM

Component of discount rates methodology	IFRS 17 considerations	Implications for ALM
Risk-free rate	Options include: ▪ Credit risk adjusted yields of government bonds ▪ Solvency II risk free rates ▪ Interest rate swaps	▪ Risk-free rate is a component of both assets and liabilities valuation; therefore it is not expected to be a source of asset – liability mismatch ▪ Risk free rate depends on currency
Reference portfolio	▪ It can be either the actual investment portfolio or a notional investment portfolio ▪ Requirement to maintain duration matching with liabilities (as well as other illiquidity characteristics) ▪ Consists of government and corporate bonds, swaps, other assets…	▪ If actual assets portfolio is used, then expect volatility from trading (rebalancing of the portfolio) ▪ If notional assets portfolio is used, expect volatility from differences in Illiquidity and credit risk premiums (e.g. differences in overall credit rating / asset allocation of liquid and less liquid assets)
Illiquidity risk premium	▪ Estimation is based on reference portfolio. ▪ Need to reflect illiquidity characteristics of liabilities (not assets) ▪ Explicit calculation only required for the 'bottom-up' approach	▪ Illiquidity risk premium is included in the valuation of both assets and liabilities ▪ For liabilities it depends on the reference portfolio ▪ It could be a source of asset – liability mismatch if the liquidity profile of reference portfolio is very different to actual portfolio
Credit risk premium	▪ Based on reference portfolio ▪ Debate on estimation: 'Point-in-time' vs. 'Through the cycle' ▪ Explicit calculation only required for the 'top-down' approach	▪ Credit risk premium is included in the valuation of assets but excluded from the valuation of liabilities; ▪ It could be a source of asset – liability mismatch
Ultimate forward rate (UFR) and Extrapolation method	▪ UFR is a long-term discount rate (≈ long term average real yield plus target inflation) ▪ Used in Solvency II; not required explicitly for IFRS 17 ▪ Insurers are free to choose any valid methodology for extrapolating discount rates. (e.g. Smith-Wilson, Nelson-Siegel)	▪ UFR/ extrapolation method not used for the valuation of assets; ▪ UFR could be a source of asset – liability mismatch, (e.g. decrease sensitivity of long term liabilities)

Basic comparison of Solvency II and IFRS 17 discount rates

Component of discount rates methodology	Solvency II	IFRS 17
Risk-free rate	▪ EUR/ GBP: Swap rates (credit-adjusted if required)	Options include: ▪ Credit risk adjusted yields of government bonds ▪ Solvency II risk free rates ▪ Interest rate swaps
Reference portfolio	▪ Matching Adjustment: the reference portfolio consists of the actual assets ▪ Volatility Adjustment: the reference portfolio is defined by regulators	▪ It can be either the actual investment portfolio or a notional investment portfolio ▪ Requirement to maintain duration matching with liabilities (as well as other illiquidity characteristics) ▪ Consists of government and corporate bonds, swaps, other assets…
Illiquidity risk premium and Credit risk premium	▪ Not required for Solvency II	▪ Estimation depends on the reference portfolio and the calculation method. ▪ Matching Adjustment could be used as a proxy for Illiquidity risk premium; other options are available
Ultimate forward rate (UFR) and Extrapolation method	▪ UFR is estimated annually by EIOPA ▪ Extrapolation method is Smith-Wilson	UFR estimation is not required explicitly by the standard. Options include: ▪ To use Solvency II UFR ▪ To use extrapolating methods that not require UFR as an input (e.g. Nelson-Siegel model)

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Sensitivities and sources of mismatch

Under IFRS 17 liabilities are sensitive to:

- Reference portfolio rebalancing (e.g. in order to maintain duration matching and/or target credit rating)
- Risk free rates : mainly driven by central banks' policies, QE, inflation expectations
- Credit risk premium: which depends on reference portfolio target credit rating; asset allocation and calculation method
- Illiquidity risk premium: which is implicitly affected by both risk free rates and credit risk premium

Sources of asset-liability mismatch:

- Duration mismatches: (1) actual portfolio vs. liabilities; (2) actual portfolio vs. reference portfolio
- Credit risk premium: affects assets but not liabilities, as credit risk is removed from IFRS 17 discount rates
- Liquidity risk premium: if liquidity profile of reference portfolio is very different to actual investment portfolio
- Ultimate forward rate (UFR) is not used for the valuation of assets. It could be a source of asset – liability mismatch, (e.g. decrease sensitivity of long term liabilities)
- Different discount rates could be used for gross insurance liabilities and reinsurance recoveries, depending on their illiquidity characteristics
- Currency mismatches

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Annuities

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IFRS 17 – ALM for Annuities

IFRS 17 will behave differently to current reporting metrics as market conditions change.

We'll look at several aspects:

- **Interest rates**
- **Risk Adjustment**
- **What about the lead up to 2023?**

Annuity ALM

- Most annuity insurers will want to minimise the volatility of solvency, accounting and value metrics. Annuity liabilities are very sensitive to market conditions since they are paid over very long time periods.
- Most insurers in the UK hedge either IFRS or Solvency. Hedging IFRS will mean Solvency is volatile, and vice versa.
- May have dynamic hedging strategies where the hedging benchmark changes i.e. if solvency declines, then hedging solvency may become more important.

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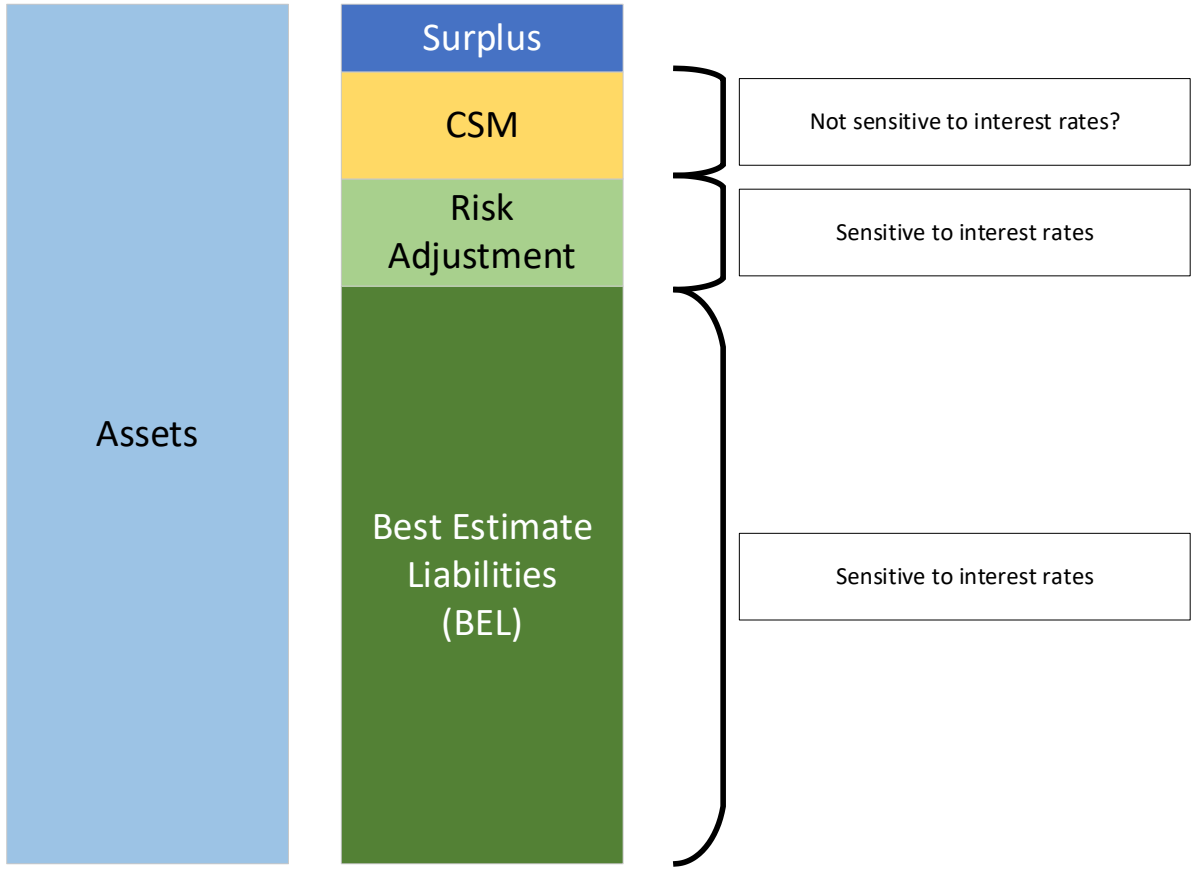
Interest Rates

The IFRS 17 balance sheet is different and will respond differently to changes in conditions. We're looking at interest rates, but inflation and credit spread behaviour will be different too.

- The Best Estimate Liability is a "best guess" as to the amount needed to pay liabilities. For an annuity insurer it's similar, but not quite the same as the SII BEL:
  - Demographic assumptions likely to be the same
  - Discount rate may be different
  - Expense reserves may be lower
- The Risk Adjustment reflects how much an insurer requires to be paid to take on non-financial risk. Many ways to set this, but many insurers are likely to leverage their SII capital models so it's likely to behave like a much smaller SCR
- The Contractual Service Margin, or CSM, represents deferred profit and is calculated using "locked" financial assumptions set when business is sold, so shouldn't be sensitive to changes in financial conditions, so we can ignore for ALM (…maybe)



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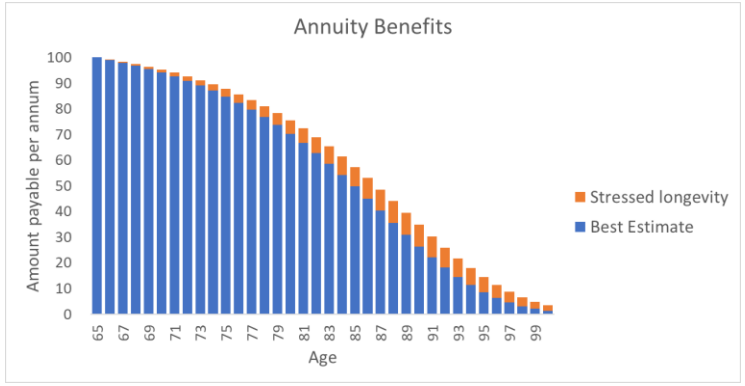
Risk Adjustment (1)

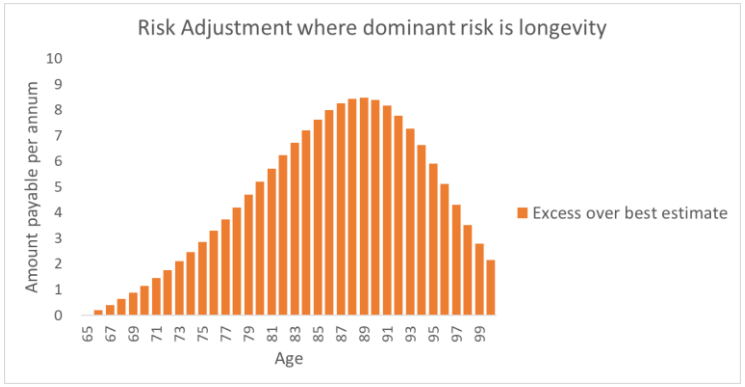
Many annuity insurers are planning to set the Risk Adjustment by leveraging their Solvency II models.

- Standard is not prescriptive.
- Could model this like either the Risk Margin or the Solvency Capital Requirement (SCR)
- Risk Adjustment likely to be much smaller than SCR?
  - Only captures **non-financial** risks
  - Reflects compensation required by insurer to take these risks, rather than a regulatory solvency requirement
  - Only operational risk specific to the insurance liabilities

Possible outcome:

- Sensitivity of Risk Adjustment lower than SCR since its smaller
- Similar duration since its using similar models





Sensitivity of IFRS 17 Risk Adjustment

- Result will be very familiar to anyone hedging longevity capital.
- For annuity insurers, key risk is longevity. Stressing mortality has limited impact on cash flows payable in early years
- Most capital arises due to changes in later years
- Duration of Risk Adj > Duration of BEL
- So % change in Risk Adjustment as interest rates change is bigger than % change in BEL

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Risk Adjustment (2)

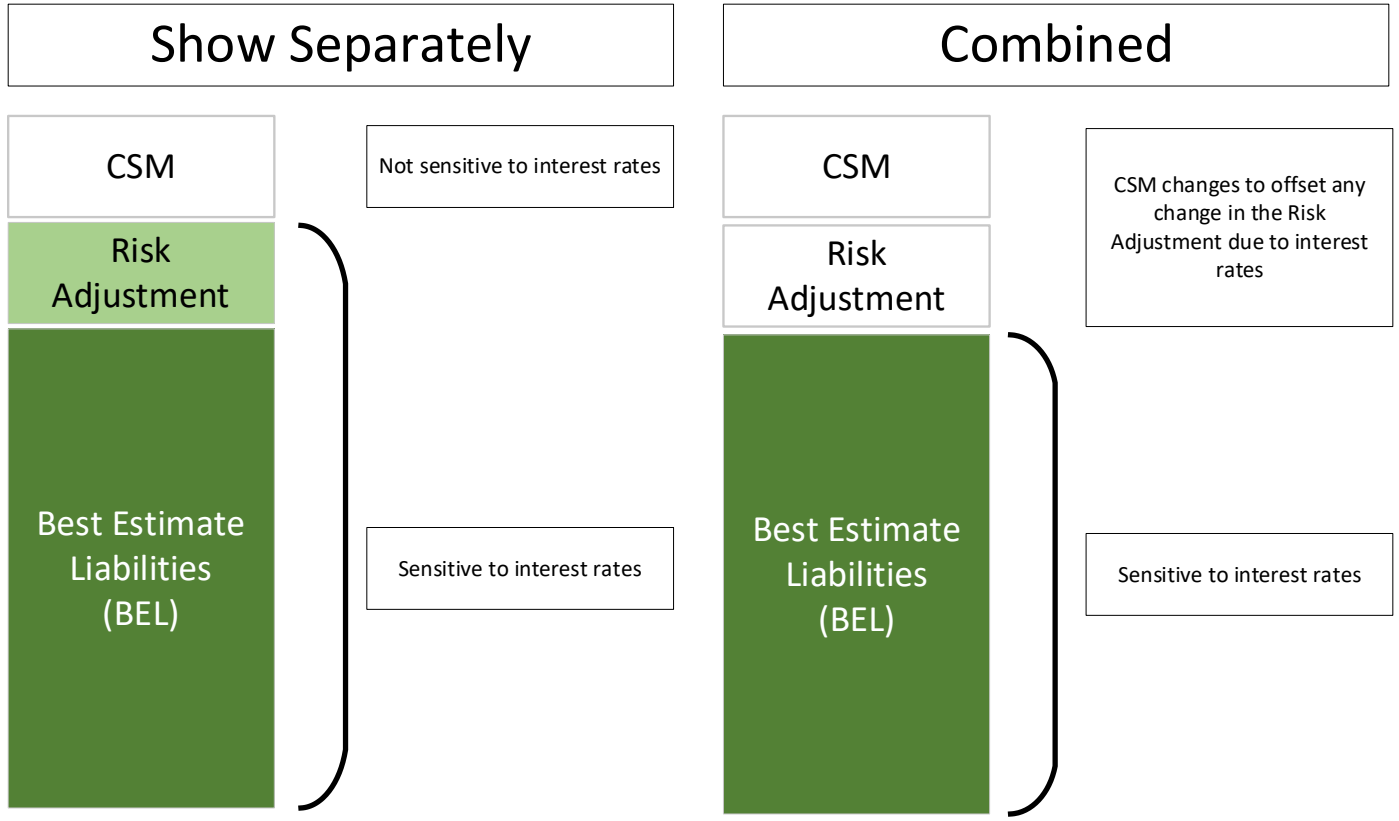
IFRS 17 gives an option as to how changes in the Risk Adjustment are presented in the Report and Accounts.

- The way this is presented also may also change behaviour
- The change in the Risk Adjustment, for financial and non-financial reasons, can be **combined** and shown as a single movement.
- Alternatively, the financial and non-financial changes can be **shown separately**

Where the movements are shown as a single movement, financial changes will drive an offsetting change in the CSM.

This choice will affect the sensitivity of the balance sheet to changes in market conditions.

*paragraph B97(a)(ii) in the standard



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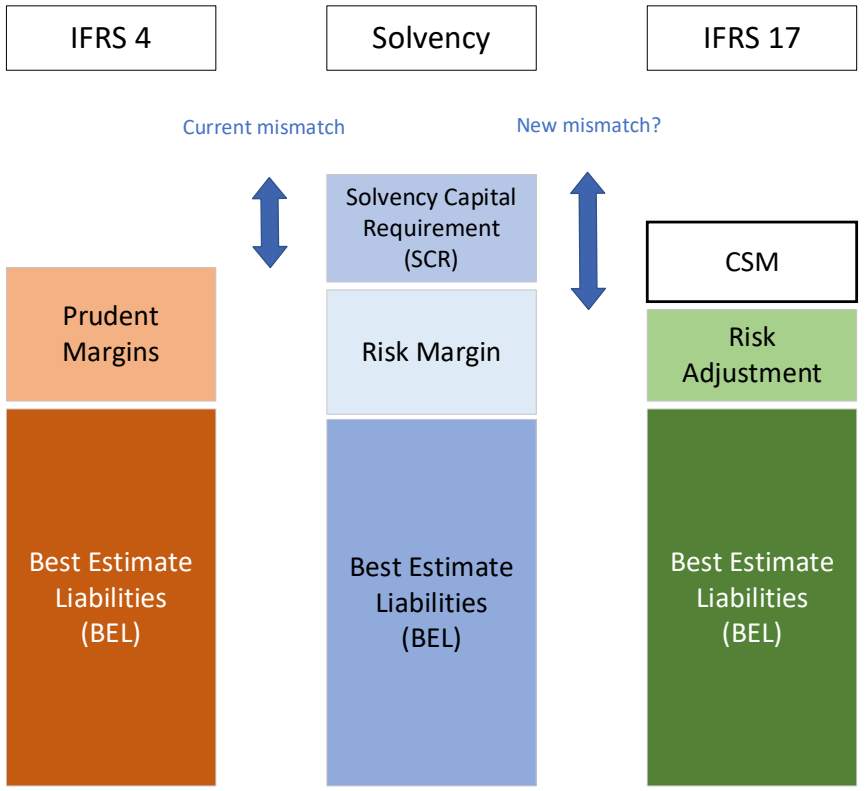
Is hedging IFRS 17 different to hedging IFRS 4?

IFRS 17 liabilities are likely to be less sensitive to market conditions than Solvency II or IFRS 4:

- The Risk Adjustment only applies to **non-financial** risks, while IFRS 4 prudent margins may also apply to some **financial** risks as well.
  We might expect the IFRS 17 liabilities to be **less** sensitive than IFRS 4 liabilities since the risk adjustment is likely to be less than prudent margins (though it would be possible for the risk adjustment to be bigger)
- The Solvency II balance sheet has sensitivity from the BEL, Risk Margin and SCR, since the Risk Margin and SCR are likely to be bigger than the Risk Adjustment.
  This means the solvency balance sheet liabilities and capital will be much **more** sensitive than the IFRS 17 liabilities.
- If IFRS 17 liabilities are less sensitive to market conditions than IFRS 4 liabilities, companies hedging IFRS liabilities likely to see more volatile Solvency results (and vice versa for companies hedging IFRS liabilities).

Relative sensitivities of annuity liabilities & capital



1. Not to scale
2. Solvency and IFRS BEL may not have the same sensitivities
3. Ignores tax and TMTP (TMTP is the capital relief insurers received on the move to the Solvency II regime)
4. Some companies might have very low IFRS 4 prudent margins, or choose to have a very high risk adjustment which could change the relative sizes of the sensitivities

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Before 2023…

Challenges for 2021

The opening balance sheet for IFRS 17 will be set at the end of 2021.

- The CSM set at this point will be a key driver for opening equity and, as this CSM is released, future profits.
- Many companies are likely to use a “fair value” for a large part of the CSM, which will be based on a calculation at the end of 2021.
- May be heavily dependent on market conditions at the end of 2021.

Challenges for 2022

Insurers will need to decide what to do during 2022.

- IFRS 4 results will still need to be published for the 2022 calendar year
- During 2023, insurers will also need to publish comparative results for IFRS 17 (latest publication date will be at interims 2023)
- Hedging IFRS 4 could lead to a volatile IFRS 17 result the first time its published, but hedging IFRS 17 may lead to a volatile IFRS 4 result the last time its published.

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With-profits

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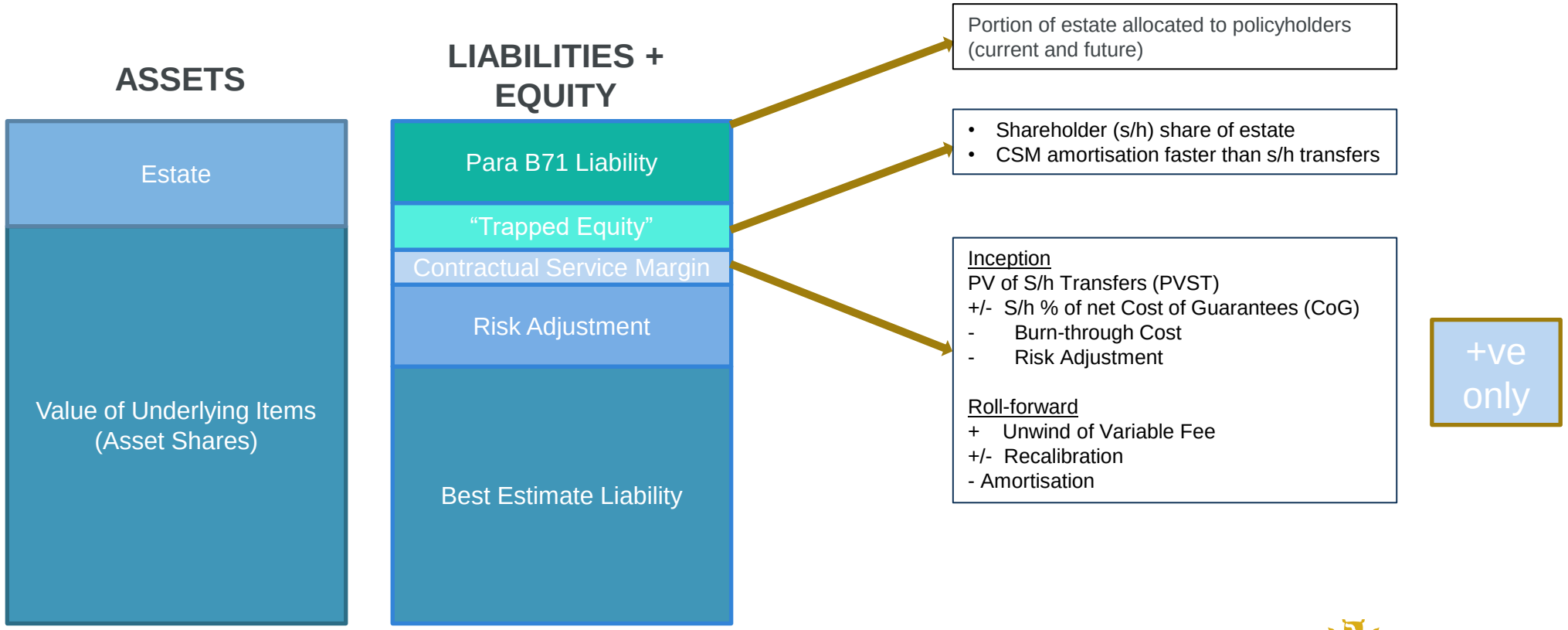
With-profits under IFRS 17

- assumes Par business only



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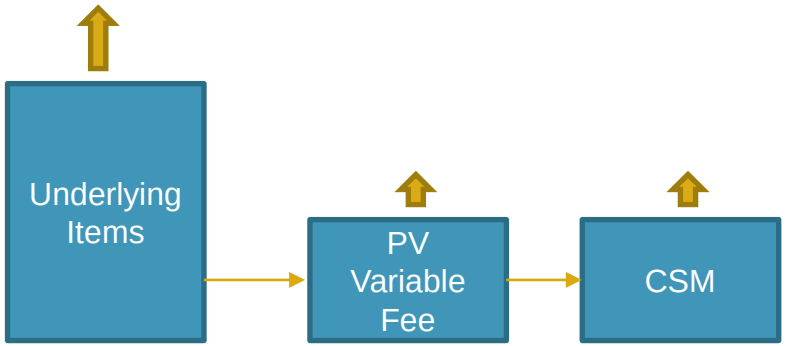
VFA 101

- The Variable Fee Approach applies to (gross) contracts with direct participation features, i.e. with-profits & unit-linked, where liabilities are exposed to underlying market movements. Reinsurance held is ineligible for the VFA.
- Under the VFA, the CSM is recalibrated for non-market and market risks
- Only use current discount rates, i.e. no concept of lock-in
- Still have choice of top-down vs bottom-up, although top-down may be harder to calibrate than for annuities, e.g. deriving spread & risk allowance for equities
- The eligibility criteria are specified in para B101, effectively must satisfy three conditions:
  - contractual link to underlying pool of assets (could be a reference portfolio)
  - substantial sharing of market movements with policyholder
  - market movements account for substantial proportion of policyholder returns
- Some debate around granularity of assessment, e.g. policy level, product level, fund level, and definition of substantial
- Where contract fails the VFA assessment, measured under GMM



VFA: Increase in value of underlying items leads to an increase in the PV of Variable Fee (via increase in Entity Share of Underlying Item). The CSM is then adjusted for the movement in Variable Fee. Impact is balance sheet neutral (ignoring CoG, etc.) assuming:

- No mismatch between Underlying Items and actual assets held
- CSM is positive before and after
- Risk Mitigation Options not taken (see later)

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With-profits – why hedge?

- Large guarantees can build up from sum assured and declared bonuses, GARs, etc.
- Market-consistent valuation required under Solvency 1 Pillar 2, Solvency 2, IFRS 17
- Estate is exposed to guarantee costs biting (guarantees being in-the-money at exercise dates). This can be caused by falls in Asset Shares (e.g. equity, property, interest rate, default and spread exposures). The value of the estate is also exposed to interest rate and volatility risk through their impact on the valuation of guarantees.
- Shareholder is exposed to circa 10% of estate value (for a 90:10 gate), 100% of fund burn-through cost, and volatility in PV future transfers from fund
- Partial hedges from management actions, but risk remains

Hedging approaches

- Which exposures to hedge – depends on risk appetite
- Instantaneous hedging vs hedging a reporting metric
- The ‘Greeks’ measure instantaneous exposures

Measure	Risk	Definition	Example hedging asset
Delta	Equity (or property) movements	Rate of change in option / guarantee cost per unit movement in underlying	Equity futures and options
Gamma	Change in Delta	Rate of change in delta	Equity options
Vega	Volatility (Asset Shares) Volatility (Interest rates)	Rate of change in option / guarantee cost per unit movement in (implied) volatility	Equity options, Volatility index Swaptions
Rho	Interest Rates	Rate of change in option / guarantee cost per unit movement in interest rates	Interest rate swaps and swaptions

- Hedge some combination of these
- Approach 1: Static (relatively) – Purchase typically long-dated OTC derivatives from bank
- Approach 2: Run internal dynamic hedge, e.g. ‘delta hedging’ via trading and frequent rebalancing in futures or a synthetic hedge e.g. by ‘shorting’ Asset Shares

or some combination of (1) & (2)

Hedging under IFRS 17

- Under VFA the CSM is adjusted for financial risks
- Hence CSM absorbs any market volatility, right?

  WRONG!!

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CSM as market hedge - issues (1)

Failed with-profits: IFRS 17 problem child

- Some contracts might fail VFA eligibility test
- CSM will not absorb market volatility
- How are hedges allocated between GMM vs VFA business?

    - notional allocation possibly based on cause of failure, e.g. if guarantee heavily in-the-money

Asymmetry

- Hedge assets to cover Loss Component scenario only?!
- Complex put option would be needed for such an approach. Note CSM also impacted by non-market risks.
- Would a separate hedge need to be calculated per Insurance Contract Group (as CSM / Loss Component status is measured at this level)?!
- CSM not measured continuously

Future P&L

- CSM adjusted for market movements, but total profit over life of contract broadly unchanged
- e.g. Market shock => increase in CoG (hence BEL) => reduction in CSM (if positive) => lower future CSM amortisation (hence P&L)

Other metrics

- CSM is an IFRS 17 concept
- Many firms will not have IFRS as their primary hedging metric; hedging strategy may be based on S2, EC, EEV, etc.

CSM as market hedge – issues (2)

Double-hedge effect

- Under the VFA, movement in hedged liabilities goes to CSM, but movement in hedging instruments goes to P&L causing a mismatch
- => increased P&L volatility!

Risk Mitigation Option (para B115/6)

- Risk mitigation option allows movement in hedged items to go to P&L, to match movement in hedging instruments.

	2017	2020
Derivatives	✓	✓
Reinsurance	×	✓
Non-derivative assets measured at FVTPL	×	✓ excl. Entity Share

What about synthetic hedges?

- e.g. Company 'shorts' Asset Shares
- Notionally, we have 100% holding in Asset Shares + negative Asset Share holding in estate
- But can it be presented in this way?
- If not, then this is simply an Asset Share mismatch which flows through to the investment result – hence back to double-hedge scenario!

Questions

Comments

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