14 - IFRS 17: How to set the Discount Rate and Why it Matters to Your Business

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2019 Valuation Actuary Symposium

Session 14 - IFRS 17:
How to set the Discount Rate & Why it Matters to Your Business

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Moderator and Presenters

Moderator / Presenters	Background
Lisa Giancola **FSA, FCIA** **Director** **Willis Towers Watson** Toronto, ON 416.960.2639 Lisa.Giancola@willistowerswatson.com	■ Lisa is a director with the Willis Towers Watson's Insurance Consulting & Technology practice. She has over twenty years of experience at multinational insurance and reinsurance companies. Lisa provides consulting services to life and health insurers in the areas of appointed actuary work, actuarial valuations, financial reporting and regulation, financial projections and stress testing, capital and risk management, reinsurance, and peer reviews. ■ She is a key member of Willis Towers Watson's IFRS 17 team that develops technical papers on IFRS 17 topics. Her professional experience includes participation in the Canadian Institute of Actuaries ("CIA") and insurance industry committees. Currently, Lisa is a member of the CIA's Life Insurance and Financial Reporting Committee, and a number of IFRS 17 working groups.
Dan Kim **FSA, CERA, MAAA** **Director** **Willis Towers Watson** Atlanta, GA 678 684 0617 Dan.Kim@willistowerswatson.com	■ Dan is a Director with the Insurance Consulting & Technology business of Willis Towers Watson in Atlanta, U.S. Dan has consulted life insurance companies in relation to financial reporting and risk management by implementing or reviewing embedded value (EEV, MCEV), pricing and economic capital models (Solvency II, ICS, Bermuda BSCR). Dan currently leads an Economic Scenario Generation initiative for the firm's Americas Life Practice. ■ Dan's IFRS 17 related experience includes trainings, developing and reviewing guidance notes/technical papers, and financial impact analysis.

Agenda

- IFRS 17 Overview of the discount rate - The theory
- Constructing the discount rate – Practically speaking
  - Bottom-up, top-down, and examples
  - Practical considerations
- Application considerations – How is the discount rate used in calculating the IFRS 17 liability?
- Case study – discount rate sensitivity
  - Assumptions
  - Results and analysis on initial recognition and subsequent measurement
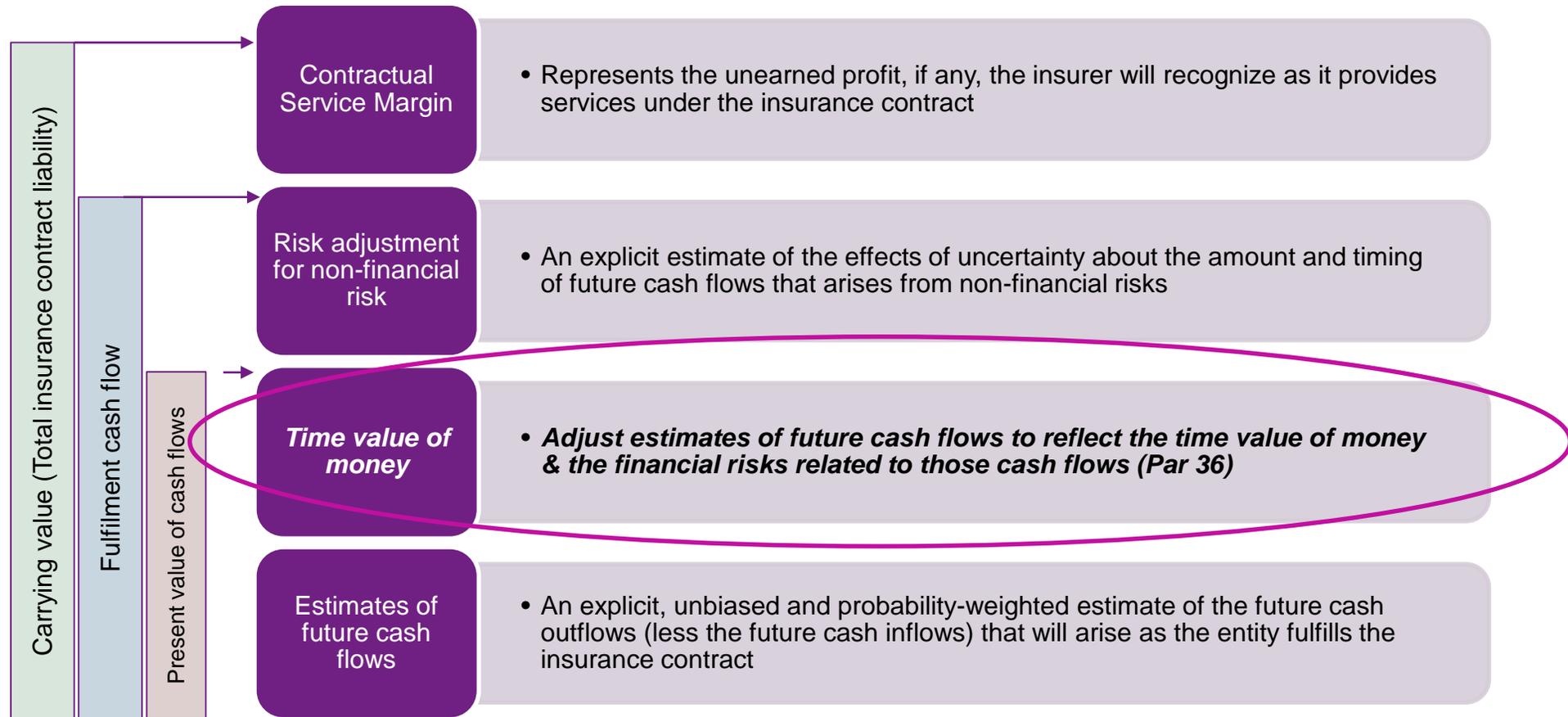- Key takeaways

IFRS17 Standard – Overview of the discount rate

The theory
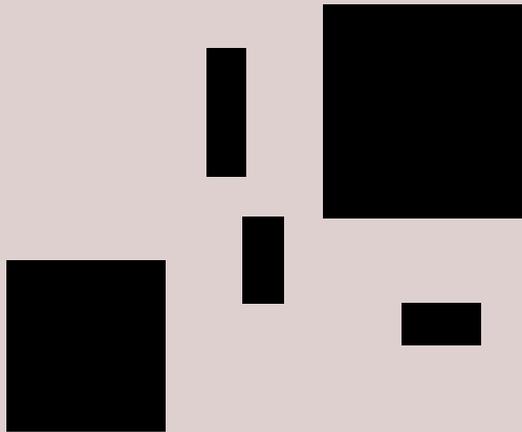
IFRS 17 Discount rates – Time value of money & financial risks

Insurance Contract Liability Measurement

Carrying value (Total insurance contract liability)
- **Fulfilment cash flow**
- **Present value of cash flows**

Contractual Service Margin
- Represents the unearned profit, if any, the insurer will recognize as it provides services under the insurance contract

Risk adjustment for non-financial risk
- An explicit estimate of the effects of uncertainty about the amount and timing of future cash flows that arises from non-financial risks

Time value of money
- *Adjust estimates of future cash flows to reflect the time value of money & the financial risks related to those cash flows (Par 36)*

Estimates of future cash flows
- An explicit, unbiased and probability-weighted estimate of the future cash outflows (less the future cash inflows) that will arise as the entity fulfills the insurance contract

IFRS 17 Standard – Discount rates

Guidance

Paragraph 36

Estimates of future cash flows shall be adjusted to reflect the time value of money and the financial risks related to those cash flows, to the extent that financial risks are not included in the cash flow estimates.

IFRS 17 Standard references:

- *Paragraph 36*
- *Appendix B - Application Guidance B72 – B85*
- *Basis for Conclusions BC185 – BC205*
- *Illustrative Examples*

B74 - Characteristics of Insurance Contract Cash Flows

Shall be consistent with other estimates used to measure insurance contracts to avoid double counting or omissions. Cash flows that do not vary based on the returns on any underlying items shall be discounted at rates that do not reflect any such variability, and vice versa.

B78 - Market Consistent

Be consistent with observable current market prices (if any) for financial instruments with consistent cash flow characteristics, in terms of, for example, timing, currency and liquidity.
Shall not contradict any available and relevant market data or observable market variables.

B79 – Liquidity Characteristics

Adjusted to reflect the liquidity characteristics of the insurance contracts. That (liquidity) adjustment shall reflect the difference between the liquidity characteristics of the insurance contracts and the liquidity characteristics of the assets used to determine the yield curve .
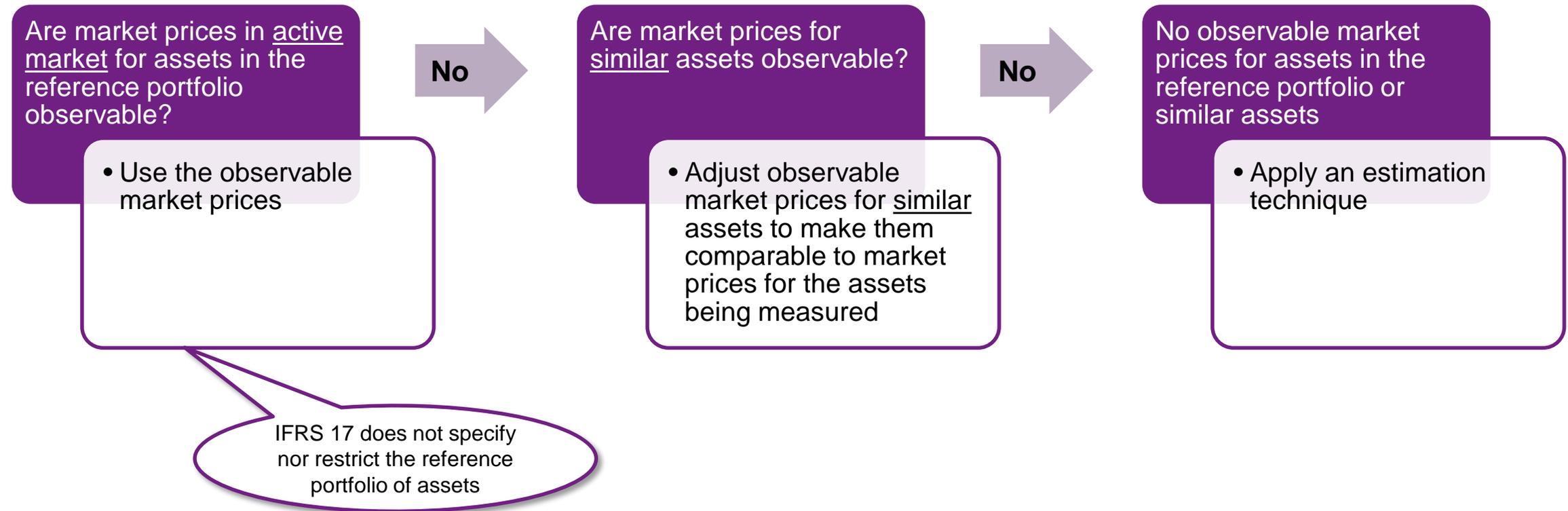
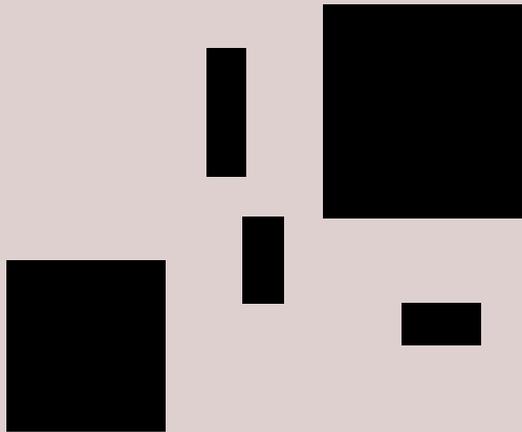# Estimating the discount rate

Bottom-up and Top-down approaches

Adjust current market rates of a reference portfolio of assets (IFRS 17 B81)

Reflects difference between the liquidity characteristics of underlying financial instruments and liquidity characteristics of insurance contracts (IFRS 17 B80)

Illustrative

Top-down

Market risk premiums for credit risk

Adjustment due to amount, timing, and uncertainty differences between asset and liability cash flows

Illiquidity premium

IFRS 17 discount rate

Current market rates on reference portfolio

Liquid risk-free curve

Bottom-up

An entity is not required to reconcile the discount rate between the two approaches

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Top-down approach

Current market rates of a reference portfolio – market prices

Estimating the yield curve under a top-down approach

Are market prices in <u>active market</u> for assets in the reference portfolio observable?	**No** →	Are market prices for <u>similar</u> assets observable?	**No** →	No observable market prices for assets in the reference portfolio or similar assets
• Use the observable market prices		• Adjust observable market prices for <u>similar</u> assets to make them comparable to market prices for the assets being measured		• Apply an estimation technique

IFRS 17 does not specify nor restrict the reference portfolio of assets

Constructing the discount rate

Practically speaking

Constructing the discount rate

Practical Considerations

- Bottom-up or Top-down
- A company may reference existing frameworks as a starting point, for example
  - Insurance Capital Standard (ICS), Solvency II, Bermuda Standard Approach, market consistent embedded value
  - Make appropriate adjustments for IFRS 17
- Examples for the observable period
  - Risk-free curve
    - Market yields are available up to 30 years for U.S. Treasuries, 50 years for USD swaps
    - Market yields are available up to 30 years for Canadian government bond and CAD swaps
  - Asset spreads (over risk-free) of a reference portfolio of assets
    - Market spreads
    - Level or curve
    - Fixed income assets versus non-fixed income assets

Adjustments to current market rates

Practical Considerations

- Adjustment for market risk premiums for credit risk
  - The objective would be to eliminate from the total bond yield the effect of credit risk and other factors that are not relevant to the insurance contracts (B85)
  - The adjustments may range by products, portfolio, etc.
  - The market risk premium calibration may include expected and unexpected credit loss allowance, while the unexpected credit loss component may not be explicit
- Adjustment for differences in amount, timing, and uncertainty between asset and liability cash flows
  - One approach is to use application ratios or predictability ratios to adjust for the level of asset and liability mismatch
  - Discount rate = Risk-free rate +
    (Market spread of a reference portfolio of assets – market risk premiums for credit risk) x **Application Ratio%**
  - A bucketing approach may be used to determine the application ratio by "bucket"

Recall: Adjust observed market rates to reflect the degree of dissimilarity between the instrument being measured and the instrument for which transaction prices are observable

Using top-down approach – example for observable period

Reference Portfolio of Assets: 50% U.S. Corporate A bonds + 50% U.S. Corporate BBB bonds

1. Current market rates on reference portfolio
2. Adjustments
3.
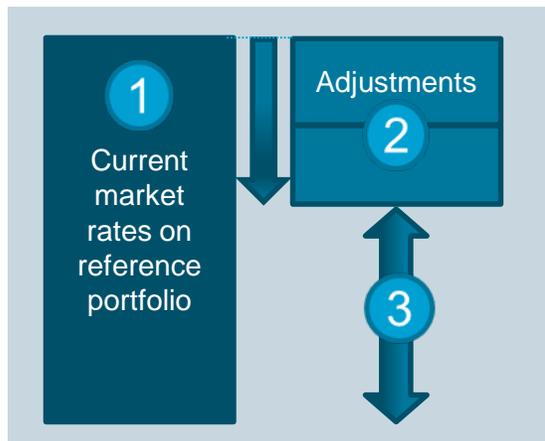
Adjust further for differences in timing, and uncertainty between asset and liability cash flows?

Excludes market risk premiums for credit risk

Illustrative

Term	Reference portfolio			Adjustments (asset credit risk)			IFRS 17 discount rates	Implied Illiquidity Premium
	Corp A	Corp BBB	Weighted average	Corp A	Corp BBB	Weighted average		
1	3.02	3.38	3.20	0.09	0.19	0.14	3.06	0.47
2	3.18	3.59	3.38	0.09	0.19	0.14	3.24	0.71
3	3.27	3.73	3.50	0.09	0.19	0.14	3.36	0.87
5	3.44	3.99	3.72	0.09	0.19	0.14	3.58	1.04
7	3.65	4.28	3.97	0.12	0.22	0.17	3.80	1.19
10	3.89	4.58	4.23	0.14	0.24	0.19	4.04	1.32
20	4.44	5.16	4.80	0.18	0.32	0.25	4.55	1.65
30	4.38	5.09	4.73	0.22	0.40	0.31	4.42	1.38

Observable period 30 yrs (market prices from active market)

All rates/yields are effective rates/par yields
Implied illiquidity premium is IFRS 17 discount rates less risk-free yield curve

Using bottom-up approach – example for observable period

Using corporate bond spreads that underlie the market rates

Adjusted the U.S risk-free yield curve for differences between the liquidity characteristics of underlying rates observed in the market and those of the insurance contracts

Illustrative

Term	Risk-free yield curve	Corporate bond spreads		Credit risk adjustment		Net spread	Illiquidity premiums			IFRS 17 discount rates		
		Corp A	Corp BBB	Corp A	Corp BBB		AR=1	AR=0	AR=0.5	AR=1	AR=0	AR=0.5
1	2.59	0.43	0.79	0.09	0.19	0.47	*0.47*	-	*0.24*	3.06	2.59	2.83
2	2.53	0.65	1.06	0.09	0.19	0.71	*0.71*	-	*0.36*	3.24	2.53	2.89
3	2.49	0.78	1.25	0.09	0.19	0.87	*0.87*	-	*0.44*	3.36	2.49	2.92
5	2.53	0.91	1.46	0.09	0.19	1.04	*1.04*	-	*0.52*	3.58	2.53	3.06
7	2.61	1.03	1.67	0.12	0.22	1.19	*1.19*	-	*0.59*	3.80	2.61	3.21
10	2.72	1.17	1.86	0.14	0.24	1.32	*1.32*	-	*0.66*	4.04	2.72	3.38
20	2.90	1.54	2.26	0.18	0.32	1.65	*1.65*	-	*0.83*	4.55	2.90	3.72
30	3.04	1.33	2.04	0.22	0.40	1.38	*1.38*	-	*0.69*	4.42	3.04	3.73

Risk-free yield curve = U.S. Treasuries
AR = Application Ratios

Constructing the discount rate – unobservable period

Practical Considerations

- Requires judgement since "no observable liquid market"
- Considerations include using historical data, view of the long-term future
- Ultimate risk-free forward rates
  - An example is to consider long-term expected inflation, real GDP growth, and risk premia
  - Another example is to use historical averages
- Ultimate illiquidity premium and adjustments
  - Some view that insurance contracts are very illiquid instruments and would demand a higher illiquidity premium at later periods
  - Some view that there is increased uncertainty of ALM at later periods; hence apply little or no illiquidity premiums after allowing for differences in amount, timing, and uncertainty between asset and liability cash flows
- Grading period to ultimate rate
  - Mostly relies on judgment; e.g., 30-40 years from last observable (liquid) point
- Extrapolating methods
  - Linear, Smith-Wilson, Nelson-Seigel-Svensson, Cubic-Spline
- Spot versus forward rates

Recall: When there is no active market or observable rates; apply an estimation technique consistent with paragraph 89 of IFRS 13
- *use the best information available in the circumstances*
- *inputs might include the entity's own data*
- *might place more weight on long-term estimates than on short-term fluctuations*
- *adjust the data to reflect all information about market participant assumptions that is reasonably available*

IFRS 17 – examples of discount curves

Annual Forwards

Application ratio = 1
Applicatio ratio = 0.5
Application ratio = 0
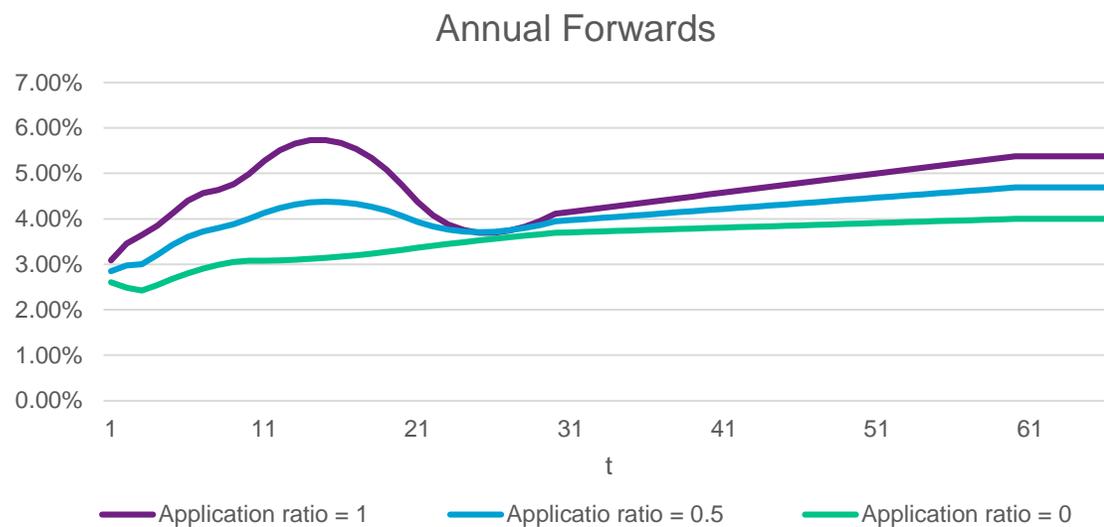
- Observable period
  - Consistent with market rates (par rates)
  - Application ratio of 1 has largest illiquidity premium, and the most variability in the observable period (year 20 vs year 30 illiquidity premium
- Unobservable
  - Grades to 4% risk-free forward rate from yr 30 to yr 60
  - Constant 30-yr illiquidity premium

- Does the shape of the curve matter?
  - **The example is based on current market rates where available (observable period)**
  - **Depends on how ultimate rate is calibrated**

Other considerations

- Own credit risk
  - BC197… requires an entity to disregard its own credit risk when measuring the fulfilment cash flows
- Replicating portfolio
  - BC204. The Board noted that a link between cash flows and underlying items could be captured by using replicating portfolio techniques, or portfolio techniques that have similar outcomes … If such a portfolio exists and is measurable, the appropriate discount rate(s) for the replicating portfolio would also be the appropriate discount rate(s) for the liability.
  - BC205. … Hence, IFRS 17 permits, but does not require, the use of a replicating portfolio technique and allows other approaches, such as risk-neutral modelling.

Application Considerations

How is the discount rate used in calculating the
IFRS 17 liability?
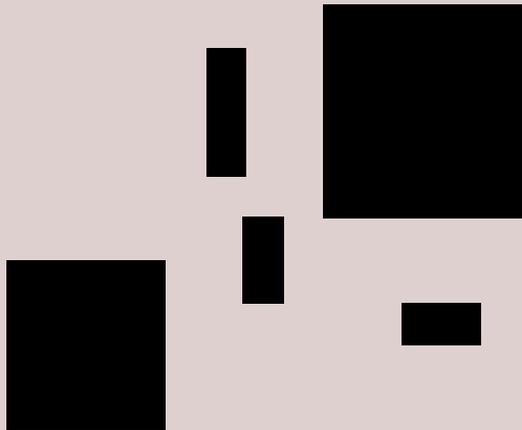
Application of Discount Rates

B72 – An entity shall use the following discount rates in applying IFRS 17

Current Discount Rates

- To measure the fulfilment cash flows[1]

Locked-in Discount Rates *(determined at date of initial recognition)[1]*

- To determine the interest to accrete on the contractual service margin for insurance contracts without direct participation features[2]
- To measure the changes to the contractual service margin for insurance contracts without direct participation features
- For groups of contracts applying the premium allocation approach that have a significant financing component, to adjust the carrying amount of the liability for remaining coverage

1 - discount rates applying paragraph 36
2 - to nominal cash flows that do not vary based on the returns on any underlying items

Application of Discount Rates

B72 – An entity shall use the following discount rates in applying IFRS 17

To determine the amount of insurance finance income or expenses included in profit or loss, if an entity chooses to disaggregate insurance finance income or expenses between profit or loss and other comprehensive income (i.e., OCI option)

When changes in assumptions that relate to financial risk do not have a substantial effect on the amounts paid to policyholders	Locked-in discount rates[1,2]
When changes in assumptions that relate to financial risk have a substantial effect on the amounts paid to policyholders	Discount rates that allocate the remaining revised expected finance income or expenses over the remaining duration of the group of contracts at a constant rate
When applying the premium allocation approach	Locked-in discount rates[1,2]

1 - discount rates applying paragraph 36
2 - applying paragraph 36 to nominal cash flows that do not vary based on the returns on any underlying items

Application of Discount Rates

Practical considerations

- Level of granularity: entity, portfolio, other
  - Some products may use top-down, while others use bottom-up
  - There may be multiple liquidity "buckets"
- New business (initial recognition)
  - Over what time period (e.g., annual vs. quarterly vs. monthly)
  - B73...to determine the discount rates at the date of initial recognition of a group of contracts…an entity may use weighted-average discount rates over the period that contracts in the group are issued…which cannot exceed one year.
- Cash flows that vary based on returns of underlying items
  - B57… discounted using rates that reflect that variability, or to be adjusted for the effect of that variability and discounted at a rate that reflects the adjustment made
  - B77… does not require an entity to divide estimated cash flows into those that vary based on the returns on underlying items and those that do not. If an entity does not divide the estimated cash flows in this way, the entity shall apply discount rates appropriate for the estimated cash flows as a whole
- Transition
  - Full retrospective approach – historical discount rates for each valuation date and issue cohort
  - Modified retrospective approach – use observable yield curve that, for at least 3 years immediately before transition, approximates the yield curve estimated by applying par 36, if available. Otherwise determine an average spread (over preceding three years) and apply to the observable yield curve.
  - Fair value approach – estimate a discount rate at a transition date applying IFRS 17 and 13

Practical Considerations

Modeling - The discount rate repository will get larger over time as new business cohorts accumulates

Discount rate repository
- Product granularity
- Valuation date
  - Last valuation date
  - Current valuation date
  - Issue cohort (e.g., quarterly) – including the locked-in discount rates for in-force business as of the last valuation date and new business during the current reporting period
- Currency
- Projected time (term structure)
- Number of scenario (more than one if using stochastic scenarios)

Case Study

Assumptions
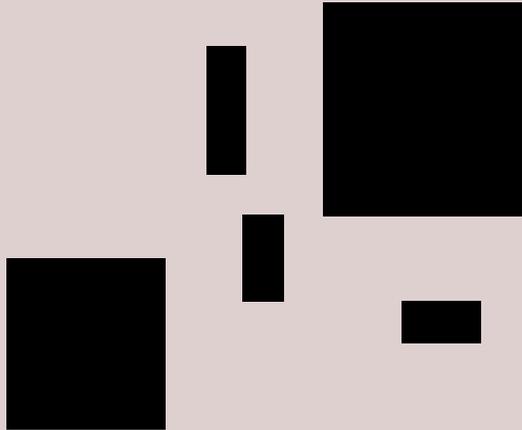
Case study – discount rate sensitivity

Background

- The case study illustrates the potential effect on the IFRS financials for sample Single Premium Immediate Annuity (SPIA) and Term insurance cash flows, applying various levels of discount rates
- Simplifying assumptions were made for illustrative purposes
- Case study results and analysis shared are applicable to the examples and circumstances only, and may vary depending on
  - Economic environment
  - Underlying actuarial assumptions, asset portfolio and investment strategy
  - The pattern of insurance contract cash flows
  - IFRS 17 methodology

Discount rate assumptions

A bottom-up approach

- Test three cases
    - Case A: Corporate bond spread (10 year A and BBB U.S. bonds) less expected default
    - Case B: Corporate bond spread adjusted by credit risk allowance and asset/liability mismatch
    - Case C: Zero illiquidity premium
- Illiquidity premium is assumed level over the entire projection period
- Risk-free rate:
    - U.S. Treasury curve (up to year 30)
    - Grade to ultimate risk-free forward rate (4%) over the next 30 years

Level of illiquidity premium
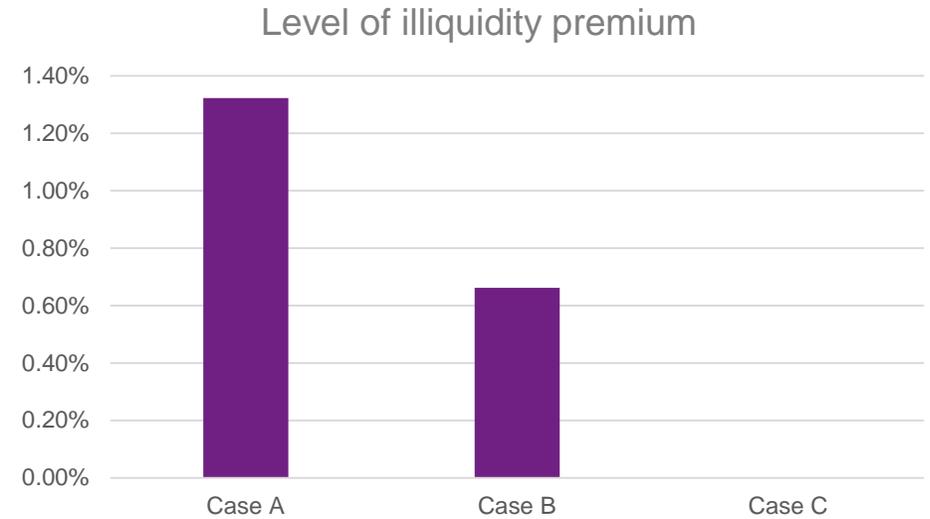
Potential upper bound given the chosen bonds

Potential lower bound

Discount rate assumptions

- ## Yield curve
  - Risk-free + illiquidity premium (from the previous slide)

Discount rates (annual forward rate)

- Case A
- Case B
- Case C

Level of illiquidity premium

Risk-free curve (annual forward rate)
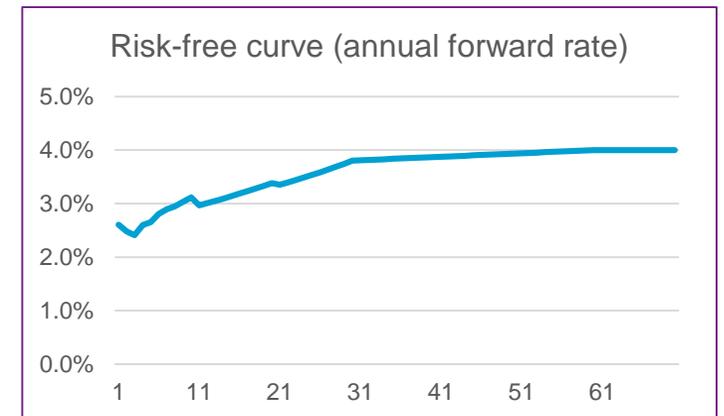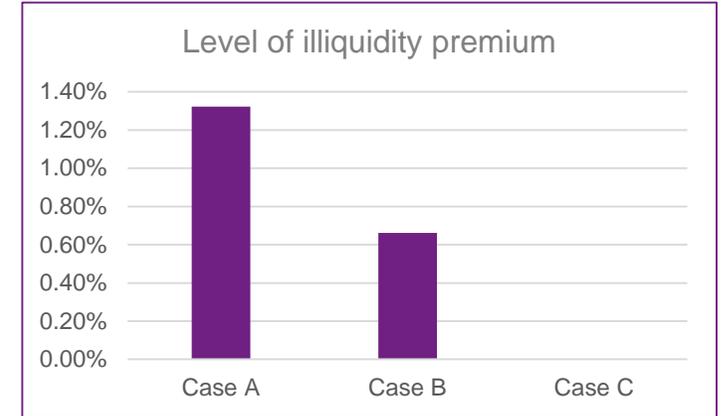
Tested insurance products

Single Premium Immediate Annuity (SPIA)

- Total single premium: USD100,000
- Actual underlying (backing) assets
  - Supported by corporate bonds with earned rates net of expected default (equals Case A discount rate)
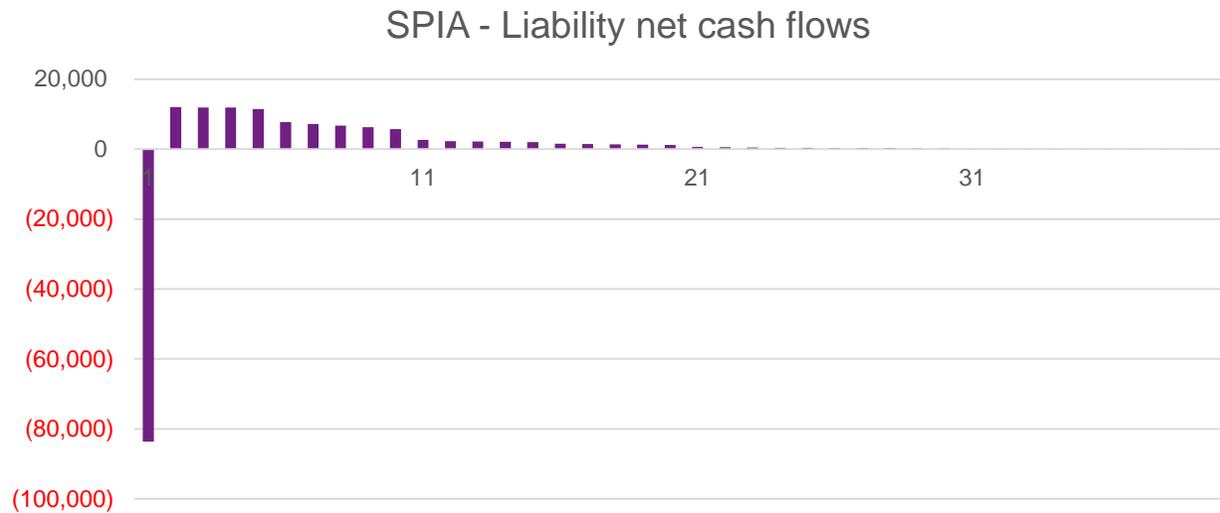
SPIA - Liability net cash flows

Negative values are expected net cash inflows (net amount received by insurer), positive values are expected net cash outflows (net payouts).

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Tested insurance products

20-year level term

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- **20-year level term + annually renewable term (20yr-term + ART)**
  - Total face amount: USD 2,500,000
  - Annually renewable after level term period

20yr-term + ART - Liability net cash flows

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<td>

- **20-year level term (20yr-term)**
  - Total face amount: USD 2,500,000
  - Any annually renewable term is not within the contract boundary

20yr-Term - Liability net cash flows

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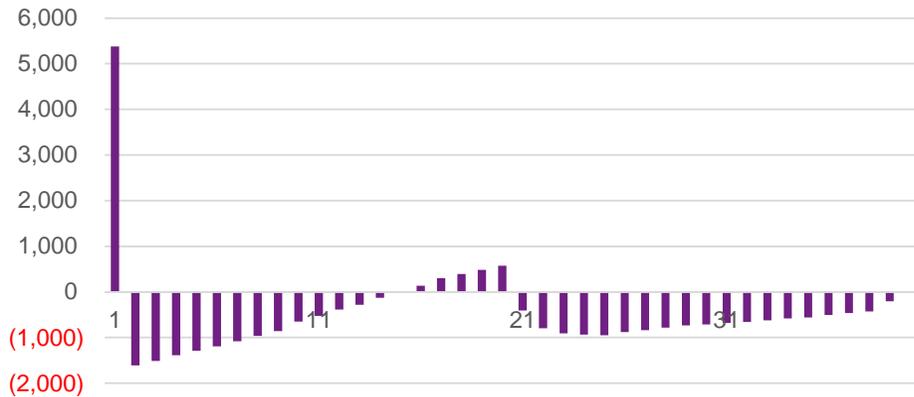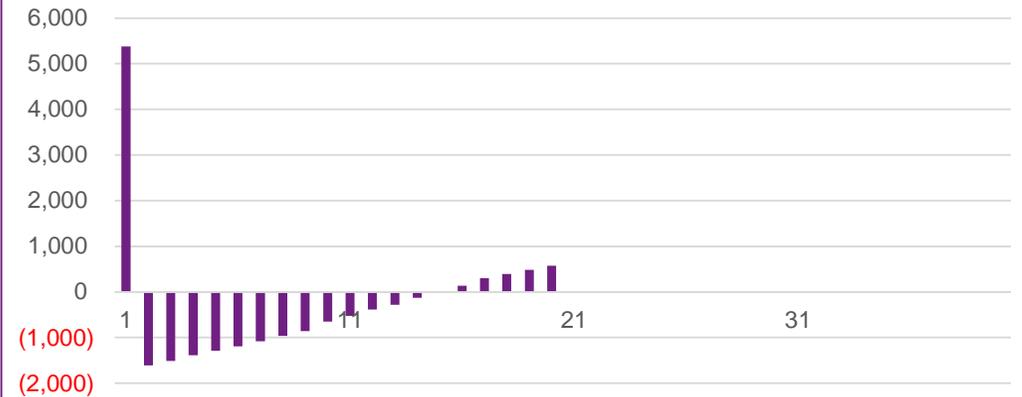
Assumed there is no underlying asset supporting the product, so zero net investment income is projected

Negative values are expected net cash inflows (net amount received by insurer), positive values are expected net cash outflows (net payouts).

IFRS 17 components and assumptions

General measurement model (or building block approach) for the case study

Total insurance contract liabilities
(liability for remaining coverage)

Contractual Service Margin
("CSM")

Risk adjustment for
non-financial risk

Present value of estimates of
future cash flows
(best estimate liabilities)

Coverage unit (The basis used to determine an amount of the contractual service margin to be recognized in profit or loss in each period), discounted
- SPIA: PV of benefits
- Term: Face amount

Developed using cost of capital approach
(4% p.a. of projected required capital)

Current estimate assumptions

IFRS 17 components and assumptions

Statement of Comprehensive Income					
	Y1	**Y2**	**Y3**	**Y4**	**…**
Insurance contract revenue					
Insurance service expenses					
Insurance service result					
Investment income					
Insurance finance income or expenses					
Net finance result					
Profit/Loss					
Net OCI effect for assets and liabilities (the latter optional under IFRS 17)					
Total comprehensive income					

Future financial projections are shown on an expected basis in the case study
➢ Projected interest rates are assumed to follow the forward curve at initial recognition

Fair value through profit or loss for assets

Not using other comprehensive income option

Case Study

Results and analysis
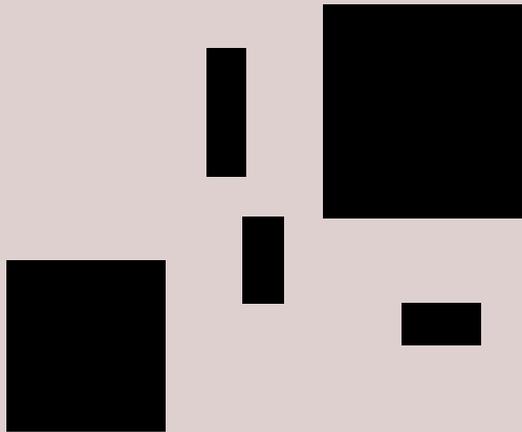
SPIA – At initial recognition

The initial contractual service margin can be sensitive to the level of discount rate

Insurance Contract Liability Components
(at initial recognition)

- Contractual service margin
- Risk adjustment
- Estimates of the present value of future cash flows
- Total Insurance Contract Liabilities
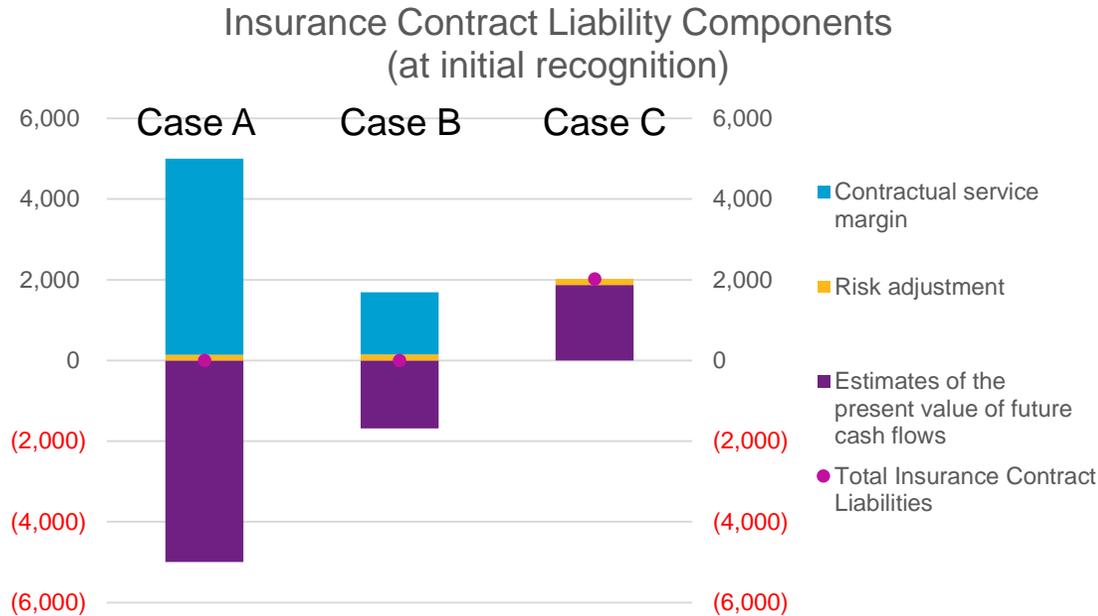
Apply different discount rates for each case

Liability net cash flows
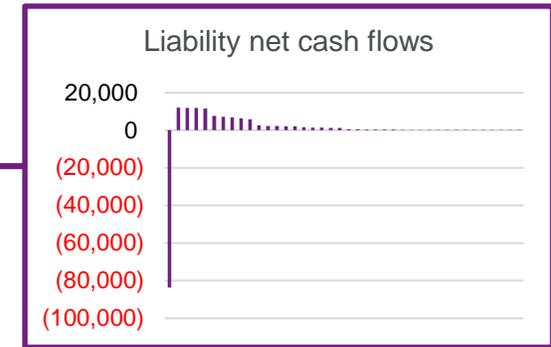
- Initial contractual service margin = Max[0, - (initial cash flows + PV of future cash flows + risk adjustment)]
  - PV of future cash flows sensitive to the level of discount rate
  - Risk adjustment may or may not be sensitive depending on approach

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SPIA – Subsequent measurements

Insurance contract liabilities

Insurance Contract Liability Components (at first year-end)

- Contractual service margin
- Risk adjustment
- Estimates of the present value of future cash flows
- Total Insurance Contract Liabilities
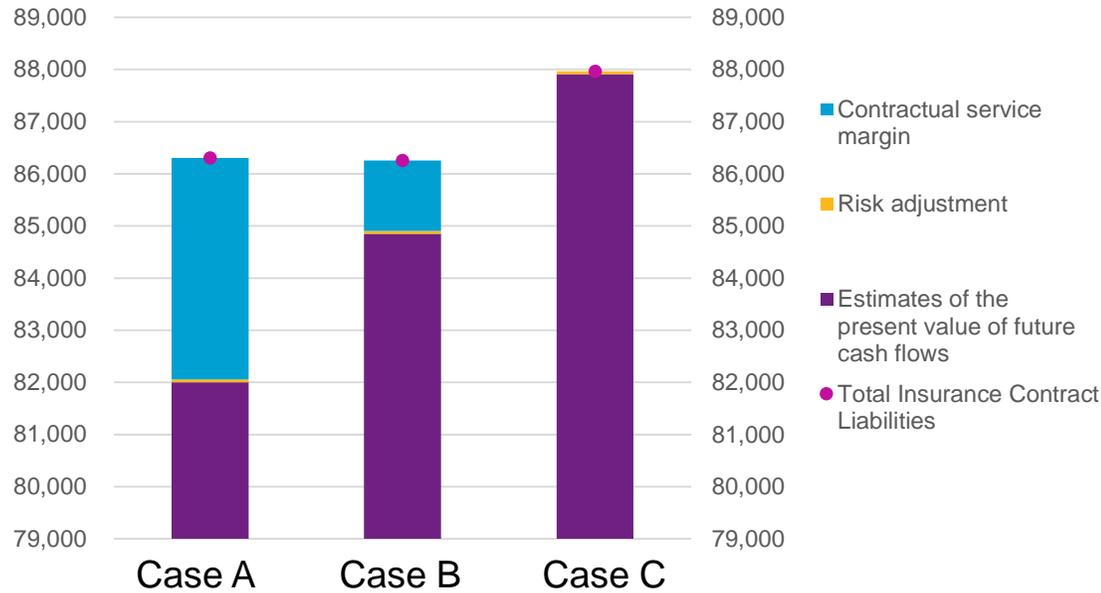
Total Insurance Contract Liabilities

- Case A
- Case B
- Case C
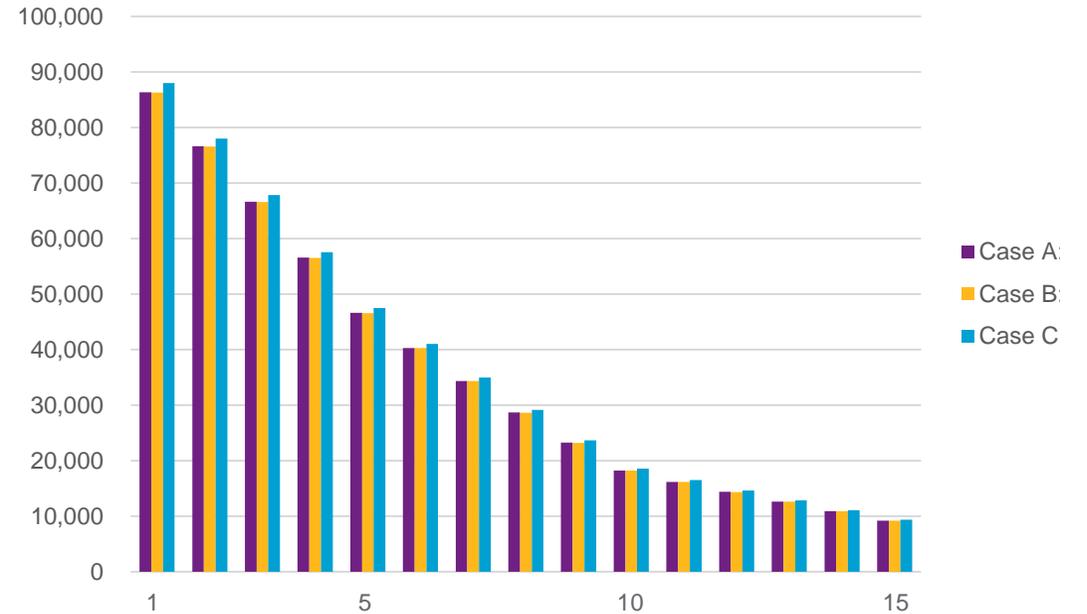
■ Case C has the largest total insurance contract liability

Assumes there is no change in cash flows or assumptions over the projection period.

SPIA – Financial forecast (1/4) – Insurance service result

Most of the projected insurance service result represents realization of the contractual service margin
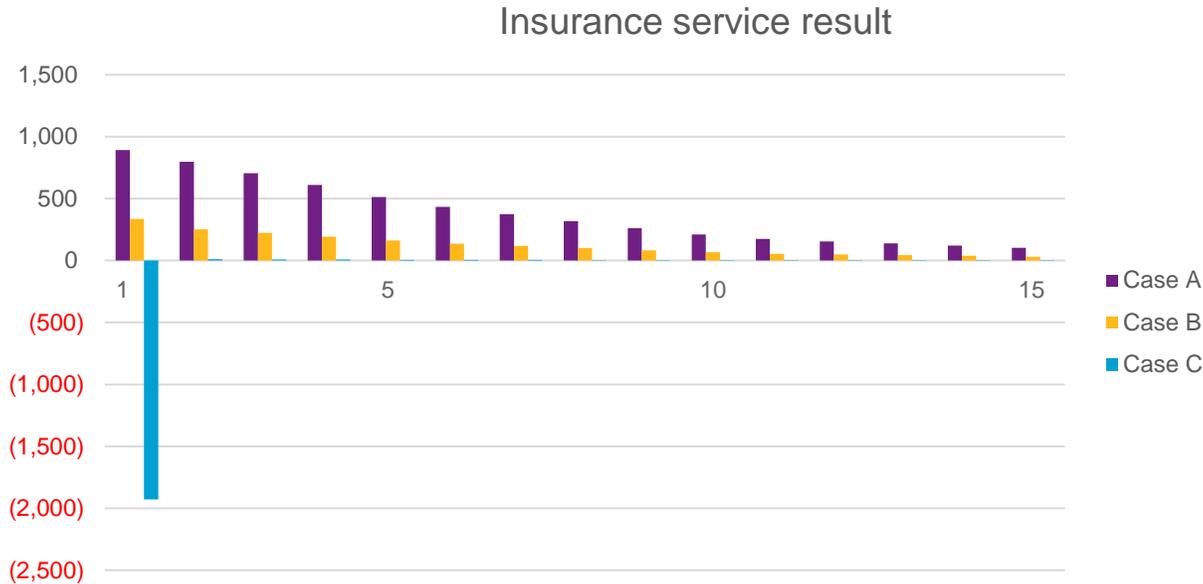
Insurance service result

- Case A
- Case B
- Case C

- Release of contractual service margin and risk adjustment (Case A and B)
- Loss recognition (Case C – onerous contract)

Statement of Comprehensive Income
Insurance contract revenue
Insurance service expenses
Insurance service result
Investment income
Insurance finance income or expenses
Net finance result
Profit/Loss

* Chart shows the first 15 years of the financial forecast where no change is expected from the initial condition

* Experience adjustments and assumption changes, <u>not assumed in the case study</u>

SPIA – Financial forecast (2/4) – Net finance result
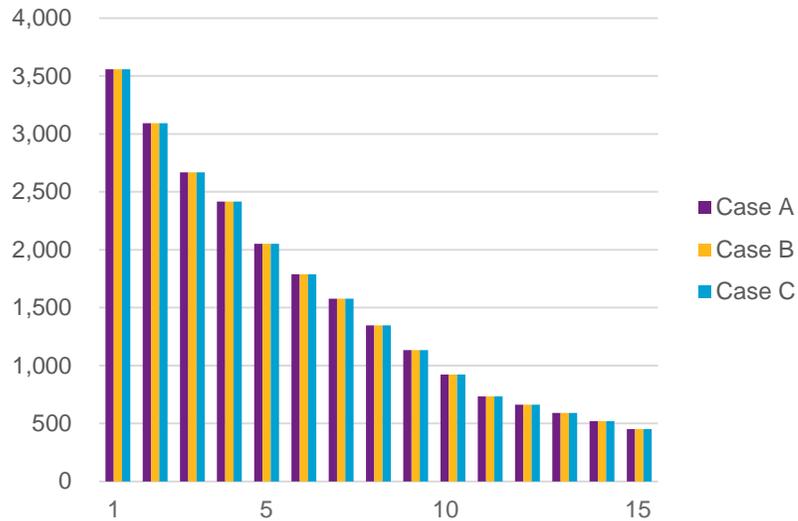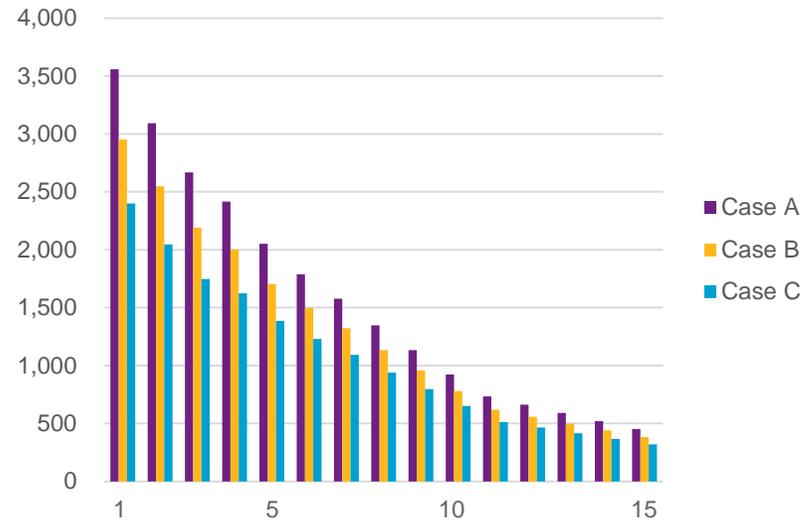
Investment income

Insurance finance income or expenses

Legend: Case A, Case B, Case C

Statement of Comprehensive Income
Insurance contract revenue
Insurance service expenses
Insurance service result
Investment income
Insurance finance income or expenses
Net finance result
Profit/Loss

For all the cases, assumed the same level of investment income (corporate bond yield less expected default)

The effect of the time value of money and the effect of financial risk and changes in financial risk

SPIA – Financial forecast (3/4) – Net finance result

Net finance result

Investment income

Insurance finance income or expenses
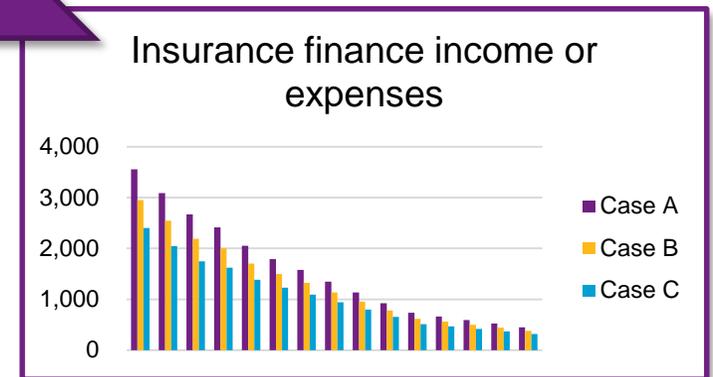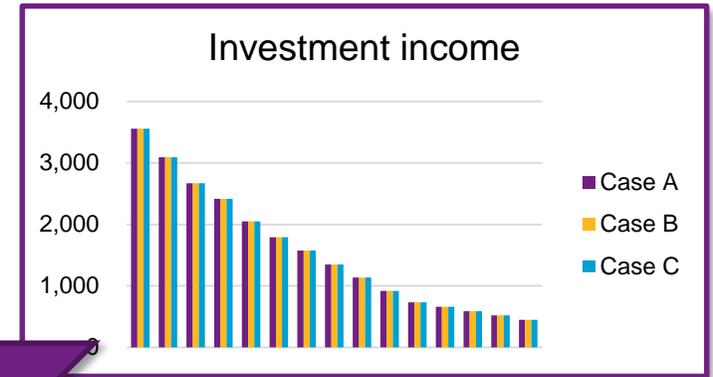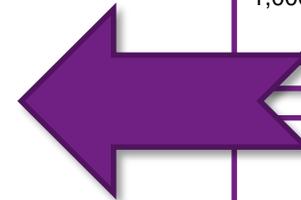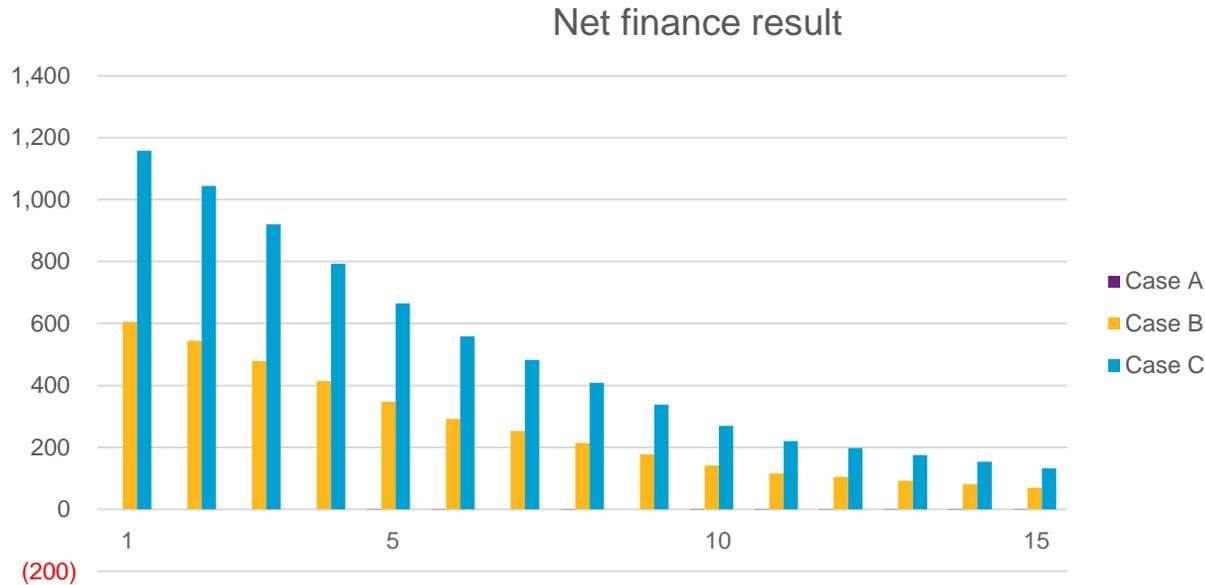
- Case A has zero net finance result as the expected asset return and liability discount rate are the same
- Case C has the largest net finance result as the expected asset return exceeds the liability discount rate (risk-free rate)

SPIA – Case study summary

PV of Profit/Loss (discounted at 7%)

Discount rates (annual forward rate)

Case C recognized a loss on day 1 and has the lowest present value of profit or loss

Case A vs. Case B
- Depends on recognition pattern of insurance service result vs. net finance result

20-year Term – At initial recognition

20-year Term + ART

Insurance Contract Liability Components
(at initial recognition)

Case A   Case B   Case C

- Contractual service margin
- Risk adjustment
- Estimates of the present value of future cash flows
- Total Insurance Contract Liabilities

Liability net cash flows

20-year Term

Insurance Contract Liability Components
(at initial recognition)

Case A   Case B   Case C

- Contractual service margin
- Risk adjustment
- Estimates of the present value of future cash flows
- Total Insurance Contract Liabilities

Liability net cash flows

■ The initial contractual service margin could be larger for products with negative net liability cash flows when discount rate is lower

20-year Term + ART – Subsequent measurements

Insurance contract liabilities

Insurance Contract Liability Components (at first year-end)

- Contractual service margin
- Risk adjustment
- Estimates of the present value of future cash flows
- Total Insurance Contract Liabilities

Total Insurance Liabilities

- Case A
- Case B
- Case C
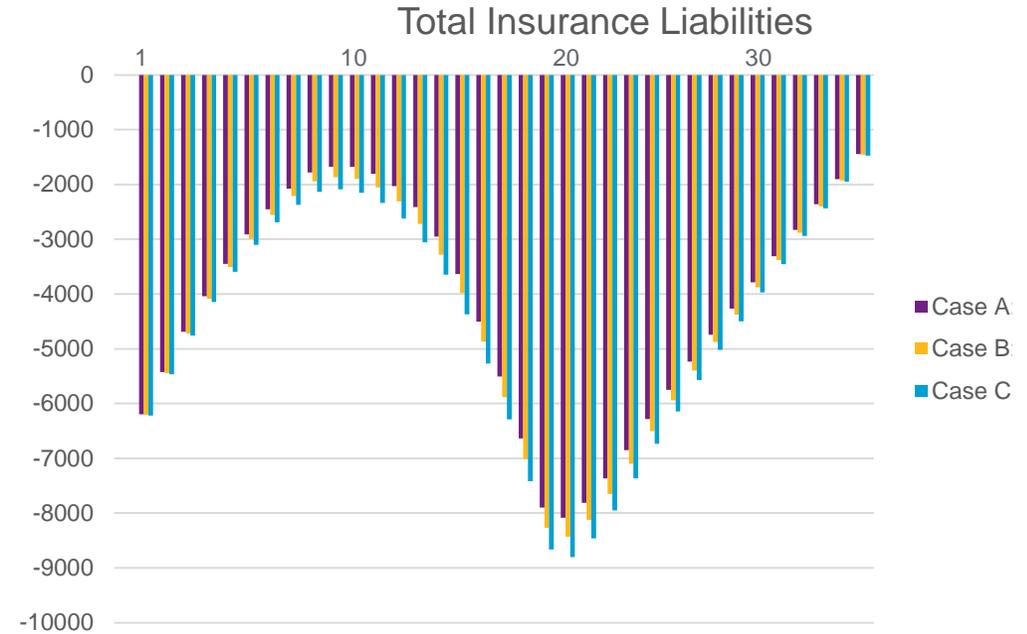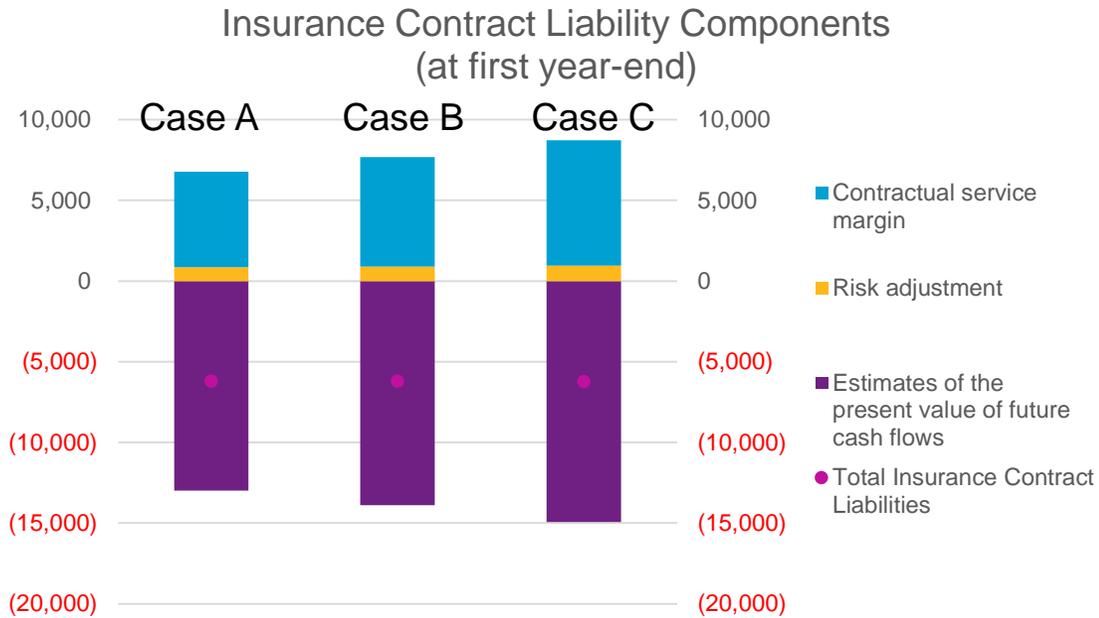
■ The liabilities are overall negative throughout the period (except at day 1)

Assumes there is no change in cash flows or assumptions over the projection period.

WillisTowersWatson **I.I'I'I.I**

20-year Term – Subsequent measurements

Insurance contract liabilities
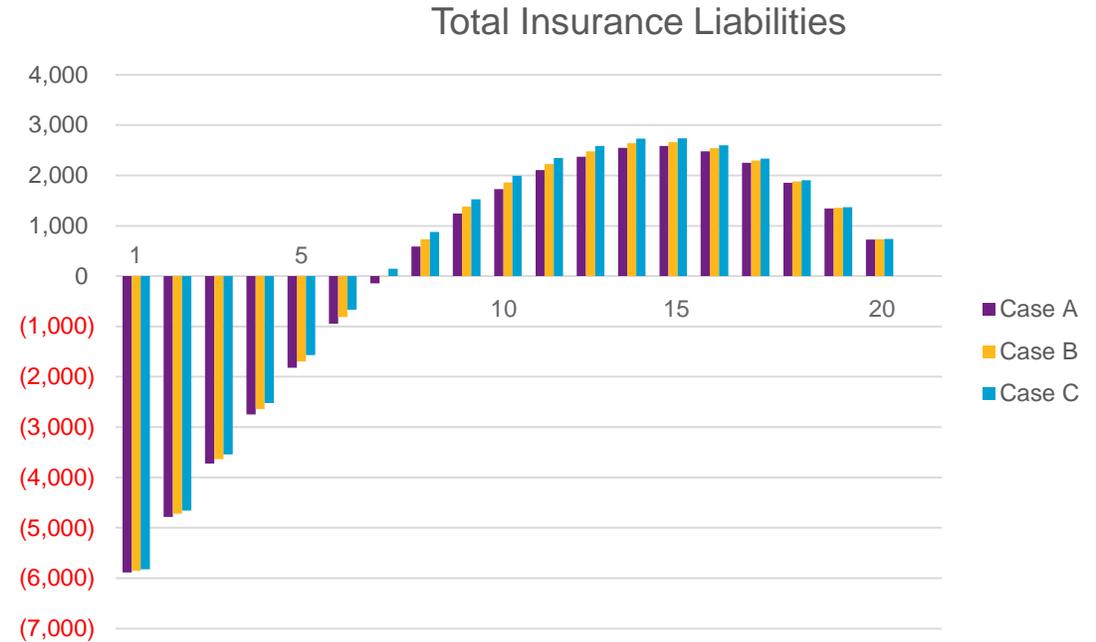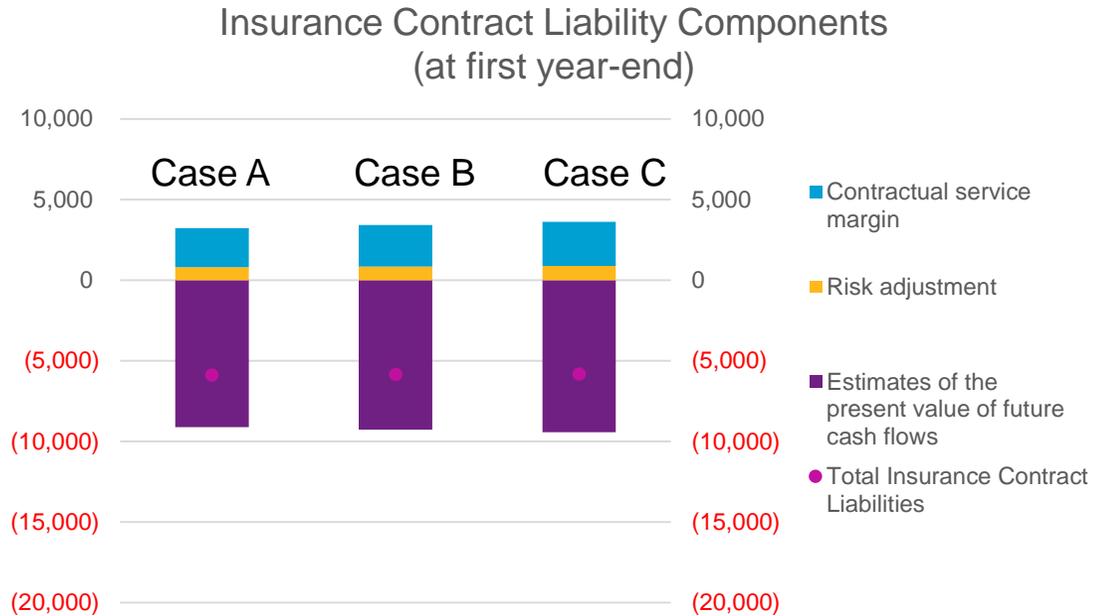
- The negative estimates of the present value of future cash flows (best estimate liabilities) are partially offset by contractual service margin at the first year-end
- Total liabilities become positive at the middle of the level term period

20-year Term + ART – Financial forecast of profit or loss
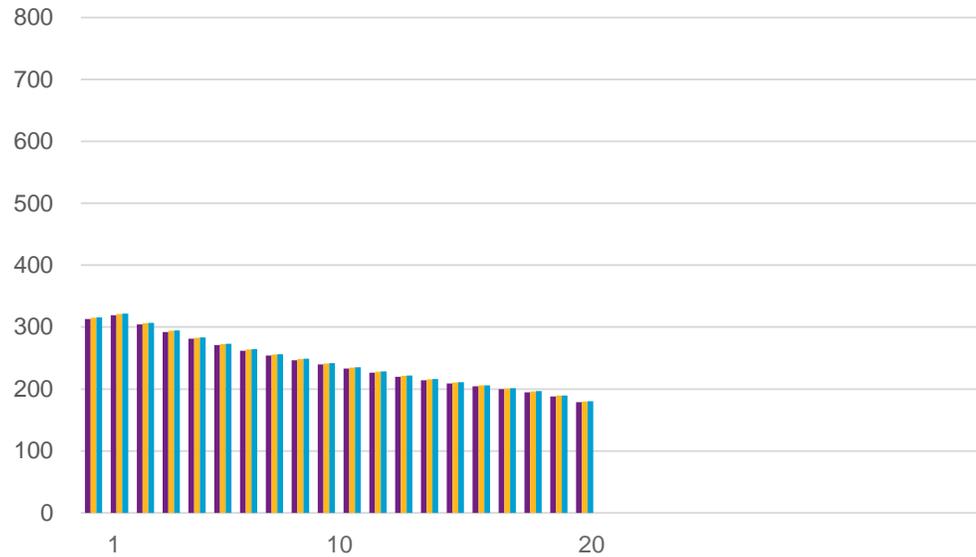

Insurance service result

Case A
Case B
Case C
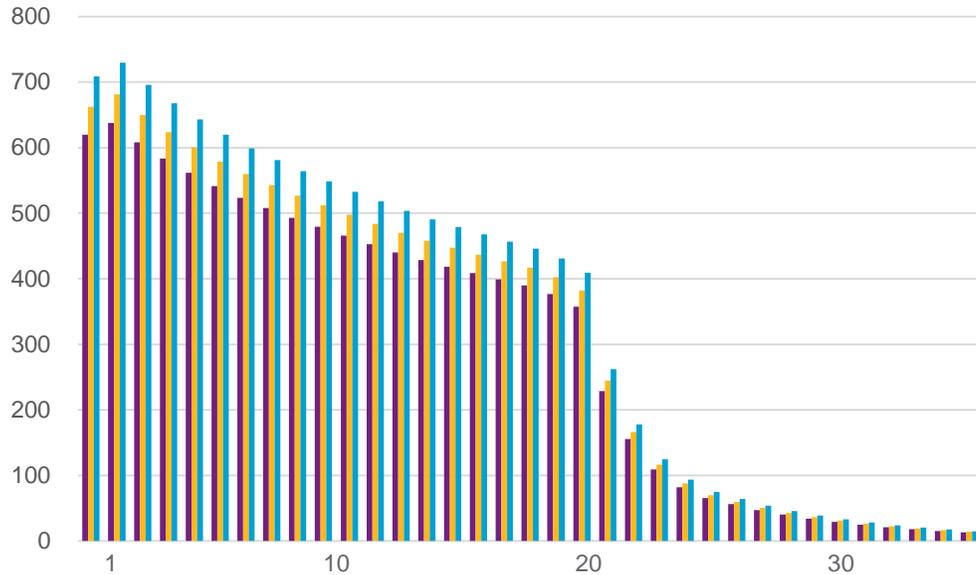
Case C had the largest initial CSM

Net finance result

Case A
Case B
Case C

- Net insurance finance income position (rather than expenses) as the liability position is negative in general
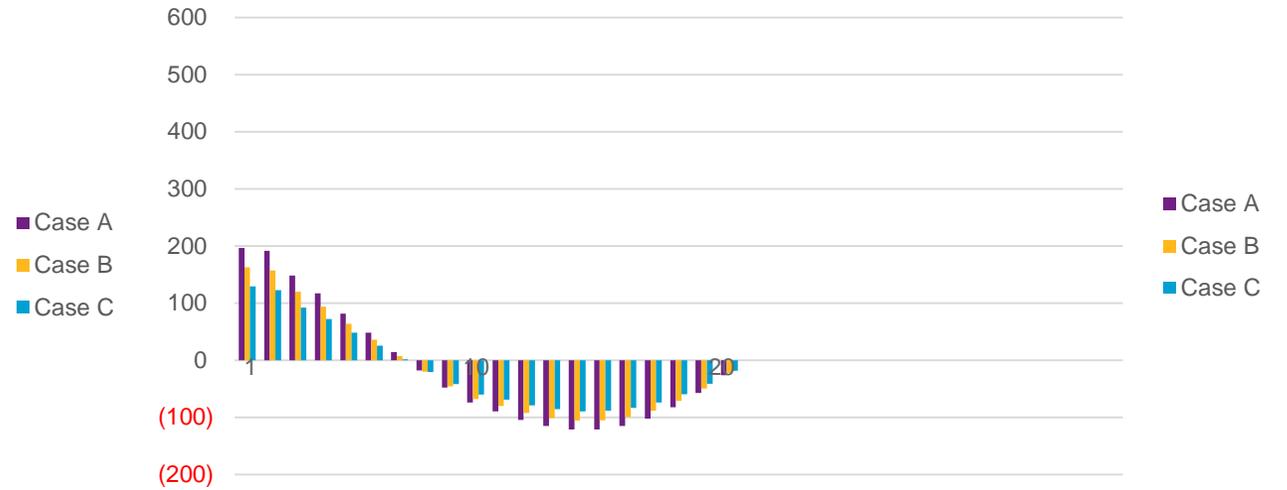- Low discount rate leads to lower net finance result

Assumes zero investment income for all cases (no underlying assets supporting the product)

20-year Term – Financial forecast of profit or loss
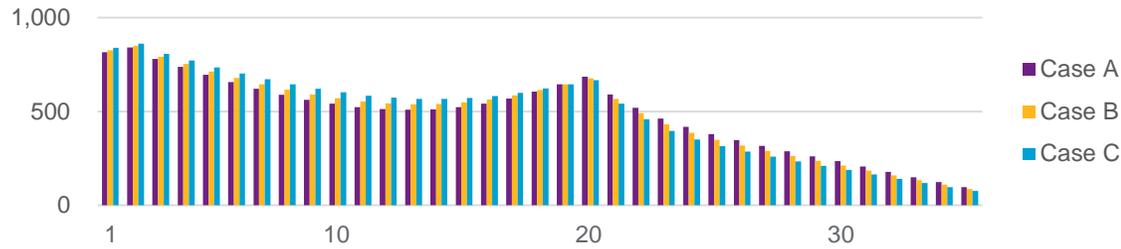

Insurance service result

Net finance result

Case A
Case B
Case C

Assumed zero investment income for all cases (no underlying assets supporting the product)
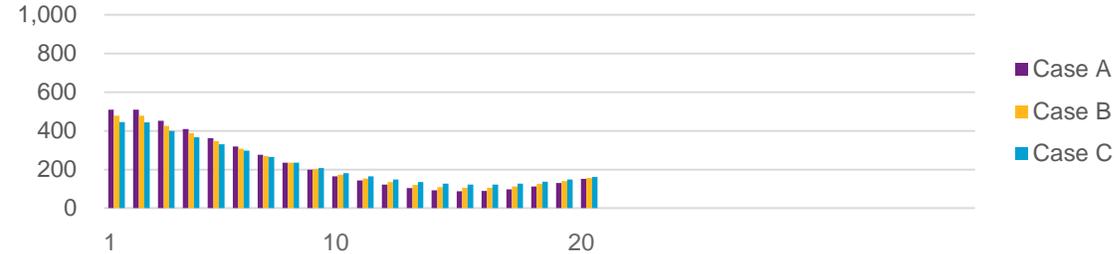
Discount rate case study analysis

- Summary of the case study
  - The discount rate could matter to the level of the initial contractual service margin
    - For products with negative liability cash flows, such as term life in our case study, a lower discount rate could lead to a larger initial contractual service margin
  - Regardless of the level of discount rate, the expected lifetime profit or loss would be the same given the same actual investment income, all else being equal
  - Profit or loss emergence pattern depends on IFRS 17 methodology, assumptions and cash flow pattern that interact with each other

Level of discount rates

Cash flow pattern

IFRS 17 methods (e.g., coverage unit, contract boundary)

- Further thoughts…
  - The variability of profit or loss may depend on the level of contractual service margin
  - The difference between the discount rate and the actual underlying assets may lead to variance of the net finance result as there will be mismatch between investment income and insurance finance income or expenses

Key takeaways

Final thoughts for implementing the IFRS 17 discount rate

- Understand IFRS 17 Standard, and the relationship with respect to your business considerations
- Leverage existing frameworks, such as cash flow models, current estimate assumptions, other market-consistent valuation methods and references, and make necessary adjustments appropriate to IFRS 17
- Make IFRS 17 discount rate policy decisions (e.g. product granularity, new business cohort granularity, reference portfolio)
  - Perform discount rate sensitivity analysis to understand the potential impacts of choosing different options
  - Balance may be needed between practicality and accuracy
- Document the implementation process (e.g., policy document, technical document, procedure document)