Financial accounting module 21: Discount rates

(The attached PDF file has better formatting.)

The final exam problems ask you to compute the insurance finance expense on the present value of future cash flows (using the current discount rates) and the accretion of interest on the contractual service margin (using the discount rates determined at initial recognition). You are not responsible for the sections on discretionary cash flows and on weighted average discount rates at initial recognition, and you are not responsible for the end-notes in this posting (which cite the text of IFRS 17).

RISK-FREE DISCOUNT RATES

This section explains the use of the risk-free discount rates for the present values of future cash flows in the general measurement approach (building block approach) for insurance contracts with nominal cash flows that do not vary with the returns on a specified pool of assets. Similar risk-free discount rates are used for

- the premium allocation approach if the insurance cash flows have significant financing components (as for liability claims with long lags between occurrence and payment)
- the accretion of interest on the contractual service margin, even if the insurance cash flows vary with the returns on underlying assets.

Although the discount rates for the present value of future cash flows and for the contractual service margin are risk-free rates, they are determined at different times:

- current market interest rates for the present values of future cash flows
- rates determined at initial recognition for the contractual service margin.

The discount rates for the present values of incurred claims in the premium allocation approach are current discount rates, but if the insurer dis-aggregates insurance finance expense between profit or loss and other comprehensive income, the insurer uses the discount rate determined when the claim occurs (not at initial recognition of the insurance contracts) as the rate for recognition in profit or loss.

The data sources for risk-free interest rates, the bottom-up and top-down methods to determine the discount rates, and the liquidity adjustments for discount rates are not reviewed in this posting, which assumes the risk-free interest rates (along with appropriate liquidity premiums) have been computed.

Importance of discount rates

For long duration insurance contracts and for contracts whose payments to policyholders vary with the expected returns on specified pools of assets, changes in financial assumptions are more important than they are for short duration insurance contracts and for the contracts with customers reported under IFRS 15.

Illustration: An insurance contract has premium received at initial recognition of 100, one claim expected in 20 years for 250, and a discount rate of 6% *per annum*. The unearned profit at initial recognition (reported as the contractual service margin) is $100 – 250 / 1.06^{20} = 22.05$. If the discount rate changes immediately after initial recognition to 4% *per annum*, the expected profit from the insurance contract changes to an expected loss of $100 – 250 / 1.04^{20} = -14.10$; if the discount rate change immediately after initial recognition to 8% *per annum*, the expected profit from the insurance contract increases to $100 – 250 / 1.08^{20} = 46.36$.

A firm's liability for contracts with consumers reported under IFRS 15 does not vary with changes in market interest rates or in the expected returns on a specified pool of assets. In contrast, the IFRS 17 insurance contract liability is adjusted for changes in discount rates or the expected returns on underlying assets.[1]

INSURER'S PERSPECTIVE VS OBSERVABLE MARKET PRICES

Some attributes of the insurance contract liability, such as the probability distribution of future cash flows and the risk adjustment for non-financial risk, are from the insurer's perspective. In contrast, the discount rates to adjust the future cash flows to present values are market values or consistent with market values.[2]

The discount rates should *reflect current market conditions from the perspective of a market participant*.[3] In contrast, the risk adjustment for non-financial risk (like the estimated future cash flows) takes the perspective of the insurer, not that of market participants.

- If the market discount rate is 5% but a highly risk averse insurer considers a 7% discount rate more appropriate, it should use the 5% market rate for insurance cash flows.
- If a highly risk averse insurer prices its policies with a 7% risk adjustment for non-financial risk but the competitive market price uses (implicitly) a 5% risk adjustment, the insurer should use the 7% figure.

If the insurance cash flows are the same as the cash flows from a financial portfolio, the carrying value of the insurance cash flows should be the same as that of the financial portfolio. Insurance cash flows can rarely be replicated by financial portfolios, but the discount rates should be consistent with observed market prices. If the discount rate for an illiquid euro cash flow in three years is 5%, the discount rate for an illiquid euro-denominated claim to be paid in three years should also be 5%.[4]

Insurance cash flows that vary with the returns on underlying assets

For some life insurance contracts, the insurer increases policyholder account balances by a crediting rate that depends on the returns on underlying assets.

Illustration: The account balance may be the premium received

- decreased each year by claims paid and by a 1% annual fee for the insurer's costs
- increased by a crediting rate equal to the return on a specified pool of assets minus 1.5%.

The discount rate is the return on the specified pool of assets, not reduced for the insurer's 1% annual fee or its 1.5% reduction to the crediting rate. If the net return on the portfolio is 6% *per annum*, the discount rate is 6% (not 6% – 1% – 1.5% = 3.5%). If the yield is 6% in 20X1 and 7% in 20X2, the discount rates are 6% in 20X1 and 7% in 20X2. The return on the specified pool of assets is not a risk-free rate; rather, it depends on the market risk and credit risk of the assets in the pool. The crediting rate on the policyholder account balance links the payments to policyholders with the return on the specified pool of assets, so the insurance cash flows have the same market risk and credit risk as the financial assets.

The contracts in the illustration above have crediting rates, not direct participation in the underlying assets, so they use the general measurement approach. Contracts with direct participation features (the policyholders receive the fair value of the underlying assets, minus the insurer's variable fee) use the variable fee approach, not the general measurement approach.

The yield on underlying assets is used for future cash flows that depend on the return from the assets. The discount rate for the accretion of interest on the contractual service margin (which is unearned revenue that does not depend on the asset yields) is the risk-free interest rate for the currency, maturity, and liquidity of the insurance cash flows.

Illustration: The insurer credits policyholder account balances by the yield on a specified asset portfolio (equal to 6% in 20X1) minus 1.5%. The risk-free rate is 3% and the liquidity adjustment is 1%. The insurance finance expense uses the 6% rate for the fulfilment cash flows and a 4% rate for the contractual service margin.

Current rates vs rates determined at initial recognition

Discount rates may be based on current interest rates or the interest rates when the insurance contracts are issued, referred to as discount rates determined at initial recognition.

- Fair value estimates use current interest rates.
- Amortized value uses the interest rates when the asset was bought.

Both approaches may be justified.

- Some GAAP discount rates for long duration contracts are frozen at initial recognition. Insurers often use the policy premium to buy bonds of similar durations as their estimated claim payments, so the discount rates for insurance cash flows remain stable, just as the yields to maturity on the bonds.
- IFRS uses fair value (current market) estimates for most financial assets, and current discount rates for insurance cash flows. The discount rate is updated at each valuation date (each year for annual returns).

Current discount rates are used for future cash flows (fulfilment cash flows), whether for future claims (liability for remaining coverage) or incurred claims that have not yet been paid (liability for incurred claims). The accretion of interest on the contractual service margin, which reflects the unearned profit in the insurance contracts valued at initial recognition uses the discount rate at initial recognition.

IFRS 9 CLASSIFICATION OF ASSETS AND IFRS 17 MATCHING

The effect of discounting on income and expense depends on how the asset or liability is valued. IFRS 9 has three classes for financial assets and liabilities: amortized value, fair value through profit or loss, and fair value through other comprehensive income. The bullet points below refer to interest income on bonds, which are most similar to the fixed liabilities of life insurance death benefits.

- Amortized value uses the yield to maturity when the bond is bought. Changes in market interest rates do not affect the carrying values of bonds held at amortized value. Many financial liabilities, such as debt issued by firms, is valued at amortized cost.
- Fair value through profit or loss derives the income as the change in the fair value of the bond using current interest rates, with the entire change recognized in profit or loss.
- Fair value through other comprehensive income derives total comprehensive income as the change in the fair value of the bond using current interest rates, but only the accretion of interest at the initial yield to maturity is recognized in profit or loss. The rest of the income is other comprehensive income.

    - If interest rates increase, the bond's fair value decreases, so total comprehensive income is less than profit or loss and other comprehensive income is negative.
    - If interest rates decrease, the bond's fair value increases, so total comprehensive income is more than profit or loss and other comprehensive income is positive.
- The bond's fair value is its par value when it matures, so amortized value and fair value give the same income for all years combined, and the total other comprehensive income is zero at maturity.

Insurance finance income or expense is analogous to interest income on bonds.

- Insurance finance expense is the change in the present value of the future cash flows using current discount rates, analogous to the fair value of bonds.
- Accretion of interest on the contractual service margin uses the discount rate determined at initial recognition of the insurance contracts. Changes in market interest rates do not affect the accretion of interest on the contractual service margin.[5]
- The insurer chooses for each portfolio of insurance contracts whether the insurance finance expense is recognized in profit or loss or is dis-aggregated between profit or loss and other comprehensive income.
    - If the insurer dis-aggregates, the expense in profit or loss is based on a systematic allocation, and the remainder is other comprehensive income.
    - The other comprehensive income for all years combined is zero when the claims are settled.
    - If the payments to policyholders do not vary with the returns on underlying assets, and the insurance finance expense is dis-aggregated between profit or loss and other comprehensive income, the amount in profit or loss is the accretion of interest at the discount rate at initial recognition.

The insurer chooses for each portfolio of insurance contracts whether or not to dis-aggregate insurance finance expense between profit or loss and other comprehensive income. IFRS 17 assumes that insurers seek to avoid accounting mismatches.

- If the insurer recognizes the financial assets backing the portfolio of insurance contracts at fair value through profit or loss, it may choose not to dis-aggregate the insurance finance expense on the insurance cash flows between profit or loss and other comprehensive income.
- If the insurer recognizes the financial assets backing the portfolio of insurance contracts at fair value through other comprehensive income, it may choose to dis-aggregate the insurance finance expense on the insurance cash flows between profit or loss and other comprehensive income.

The type of assets backing the insurance contracts may differ by portfolio.[6]

- For a portfolio of long-term whole life insurance contracts, an insurer may hold long-term, illiquid bonds, which it values at fair value through other comprehensive income to minimize fluctuations in profit or loss, so it may dis-aggregate the insurance finance expense on the whole life insurance contracts between profit or loss and other comprehensive income.
- For a portfolio of short-term property insurance contracts, an insurer may hold short-term, liquid securities, which it values at fair value through profit or loss, so it might not dis-aggregate the insurance finance expense on the property insurance contracts.

Illustration: Discount rates when market rates change

If the payments to policyholders do not depend on the expected return from a specified pool of assets (that is, the nominal cash flows do not vary based on the returns on any underlying items), the discount rate for the present value of future cash flows is the risk-free rate for assets of similar duration, currency, and liquidity as the insurance contract cash flows. Financial risk is the extra return for cash flows that have longer durations, are less liquid, or are denominated in currencies with higher expected inflation. Changes in the duration or the liquidity of the cash flows, and changes in the assumptions regarding the present values of cash flows with these durations, liquidity, or currency, change the discount rate for the present value of future cash flows and the insurance finance income or expense.[7]

On January 1, 20X1, an insurer issues a group of insurance contracts with three year contract periods:

- premium of 800 is received on January 1, 20X1
- one claim for 750 is expected to be incurred and paid on December 31, 20X3
- the risk adjustment for non-financial risk is 40 and does not accrete interest
- the coverage units are the same in 20X1, 20X2, and 20X3

The annual discount rate for the fulfilment cash flows (based on current market risk-free rates) is

- 4% on January 1, 20X1
- 6% on December 31, 20X1
- 5% on December 31, 20X2

The insurer dis-aggregates the insurance finance expense between profit or loss and other comprehensive income. We show

A. The insurance finance expense for the fulfilment cash flows in 20X1, 20X2, and 20X3
B. The insurance finance expense for the contractual service margin in 20X1, 20X2, and 20X3
C. The profit or loss and other comprehensive income in 20X1, 20X2, and 20X3

Part A: The premium is received at initial recognition and the risk adjustment for non-financial risk does not accrete interest here, so the insurance finance expense applies only to the present value of the future claim.

The present value of the claim is

- January 1, 20X1: $750 / 1.04^3 = 666.75$
- December 31, 20X1: $750 / 1.06^2 = 667.50$
- December 31, 20X2: $750 / 1.05^1 = 714.29$
- December 31, 20X3: 750

The insurance finance expense on the present value of future cash flows is

- 20X1: $750 / 1.06^2 – 750 / 1.04^3 = 0.75$
- 20X2: $750 / 1.05^1 – 750 / 1.06^2 = 46.79$
- 20X3: $750 – 750 / 1.05^1 = 35.71$

Part B: We use the discount rate determined at initial recognition for the contractual service margin:

- The contractual service margin at initial recognition is $800 – 750 / 1.04^3 – 40 = 93.25$.
- The insurance finance expense on the contractual service margin in 20X1 is $93.25 \times 4\% = 3.73$.

(We use the 4% rate at initial recognition, not the current 6% rate at December 31, 20X1.)

- The contractual service margin allocated to profit or loss in 20X1 is (93.25 + 3.73) / 3 = 32.33.
- The contractual service margin on January 1, 20X2, is 93.25 + 3.73 – 32.33 = 64.65.
- The insurance finance expense on the contractual service margin in 20X2 is 64.65 × 4% = 2.59

(We use the 4% rate at initial recognition, not the current 5% rate at December 31, 20X2.)

- The contractual service margin allocated to profit or loss in 20X2 is (64.65 + 2.59) / 2 = 33.62
- The contractual service margin on January 1, 20X3, is 64.65 + 2.59 – 33.62 = 33.62
- The insurance finance expense on the contractual service margin in 20X3 is 33.62 × 4% = 1.34

Dis-aggregate by systematic allocation

Part C: IFRS 17 says that a systematic allocation to dis-aggregate insurance finance expense between profit or loss and other comprehensive income

- is based on the characteristics of the insurance contracts, not on characteristics of the assets if their returns do not affect the cash flows of the insurance contracts.[8]
- results in aggregate other comprehensive income of zero over the life of the insurance contracts.[9]
- uses the discount rates determined at initial recognition for the insurance finance expense recognized in profit or loss if the changes in interest rates do not substantially affect the payments to policyholders.[10]

Insurers may allocate all insurance finance expense (using current discount rates) to profit or loss or allocate a constant yield to profit or loss (using discount rates determined at initial recognition). If the insurer allocates a constant yield, the insurance finance expense on the fulfilment cash flows allocated to profit or loss is

- 20X1: $750 / 1.04^2 – 750 / 1.04^3 = 26.67$
- 20X2: $750 / 1.04^1 – 750 / 1.04^2 = 27.74$
- 20X3: $750 – 750 / 1.04^1 = 28.85$

The insurance finance expense on the fulfilment cash flows allocated to other comprehensive income is then

- 20X1: 0.75 – 26.67 = -25.92
- 20X2: 46.79 – 27.74 = 19.05
- 20X3: 35.71 – 28.85 = 6.86

The other comprehensive income for all years combined is zero.

The insurance finance expense from accretion of interest on the contractual service margin is recognized entirely in profit or loss, not in other comprehensive income.

If the payments to policyholders vary with the expected returns on a specified pool of assets, so changes in assumptions that relate to financial risk have a substantial effect on the amounts paid to the policyholders, and the insurer dis-aggregates insurance finance expense between profit or loss and other comprehensive income, then the amount recognized in profit or loss if the discount rate changes is determined either by

- allocating the remaining expected finance income or expenses over the remaining duration of the group of contracts at a constant rate
- allocating the remaining expected finance income or expenses over the remaining duration of the group of contracts based on the amounts credited in the period and expected to be credited in future periods.

Non-flat yield curve

Illustration: An insurance contract issued on January 1, 20X1, has one expected claim for 100 on December 31, 20X3. The risk-free interest rate is 5% *per annum* for a 1 year bond, 5.5% *per annum* for a two-year bond, and 6% *per annum* for a three year bond. Premium of 100 is received when the contract is issued, and the risk adjustment for non-financial risk is 10.

- The present value of the future cash flows on January 1, 20X1, after the premium is received is 100 / 1.06^3 = 83.96, and the fulfilment cash flows are 100 / 1.06^3 + 10 = 93.96.
- The present value of the future cash flows on December 31, 20X1, is 100 / 1.055^2 = 89.85, and the fulfilment cash flows are 100 / 1.055^2 + 10 = 99.85.

The insurance finance expense is 100 / 1.055^2 – 100 / 1.06^3 = 5.88. The time value of money and the change in the duration of the cash flows both affect the insurance finance expense. The insurer has an accounting policy choice to either include the entire insurance finance expense in profit or loss or to dis-aggregate the insurance finance expense between profit or loss and other comprehensive income. If the insurer dis-aggregates the insurance finance expense (for nominal cash flows that do not vary based on the returns on any underlying assets) between profit or loss and other comprehensive income, the portion recognized in profit or loss uses the discount rate determined at initial recognition of the insurance contracts even for valuation dates in later years) and the portion recognized in other comprehensive income is the change in the discount rate at the current valuation date:[11]

- Profit or loss: 100 / 1.06^2 – 100 / 1.06^3 = 5.04
- Other comprehensive income: 100 / 1.055^2 – 100 / 1.06^2 = 0.85

Changes in the expected returns for duration, liquidity, and currency affect insurance finance expense. If the expected return for less liquid cash flows increases in 20X1 from 5.5% to 6.5%, or the expected return for two year bonds increases from 5.5% to 6.5%, or higher expected inflation for the currency raises the expected return on nominal cash flows from 5.5% to 6.5%, the insurance finance expense would be 100 / 1.065^2 – 100 / 1.06^3 = 4.20.

Market risk, credit risk, and inflation

Market risk (for equities) and credit risk (for fixed-income securities) do not affect the discount rate for nominal cash flows that do not vary based on the returns on any underlying assets.[12] If the payments to the policyholders of the insurance contracts depend on the expected return from a specified pool of assets (even if the contracts do not have direct participation features – that is, the payments to policyholders are not linked by provisions of the insurance contract to the fair value of a clearly identified pool of underlying assets), the discount rate for the present value of future cash flows is the expected return on the specified pool of assets, not the risk-free rate.[13] Market risk and credit risk raise the expected return on the specified pools of assets, and if this expected return has a substantial effect on the payments to policyholders, market risk and credit risk affect the discount rate for the insurance contract cash flows.

Most claims for health insurance, liability insurance, and property insurance, and claims for some types of life insurance, are inflation sensitive: higher inflation causes higher claim payments. If the inflation rate increases, the higher claim payment is reported as insurance service expense and insurance revenue, and the higher discount rate affects insurance finance expense. The probability distribution of future claim payments is based on the insurer's current estimates of future inflation, and the discount rate is the nominal interest rate until the claims are paid. Since the inflation rate may not move in tandem with the interest rate, the insurer should use the projected (nominal) interest rates and inflation rates, not the real (inflation adjusted) claim values and real (inflation adjusted) discount rates.[14] Real interest rates are used only if the payments to policyholders are inflation adjusted or the real rates provide better estimates of the insurer's liability.[15]

DISCRETIONARY CASH FLOWS

Changes to the fulfilment cash flows are offset by changes to the contractual service margin if they relate to future service, not to current or past service.

- Changes in estimates of future claims relate to future service, not current service, so the changes to the fulfilment cash flows are offset by changes to the contractual service margin (if the insurance contracts are not onerous).
- Changes in current market rates relate to current service, not future service, so they affect fulfilment cash flows and are not offset by change to the contractual service margin.

Changes to claim payments may stem from several sources:

- Changes unrelated to interest rate changes, such as changes in mortality rates, claim frequency, or claim severity that relate to the liability for remaining coverage, are offset by changes to the contractual service margin (subject to the restriction that the contractual service margin may not be negative).
  - An increase in a claim estimate increases the fulfilment cash flows and decreases the contractual service margin an equal amount (subject to a lower bound of zero), and does not affect profit or loss.
    - The decrease in the contractual service margin reduces the allocation to profit or loss over the current and subsequent years of the contract period.
  - A decrease in a claim estimate decreases the fulfilment cash flows and increases the contractual service margin an equal amount, and does not affect profit or loss.
    - The increase in the contractual service margin raises the allocation to profit or loss over the current and subsequent years of the contract period.

- Changes stemming from movements in market interest rates are changes related to current services, not to future services. A change in the current market interest rate from 5% to 6% is a change in the current market rate, not a re-estimate of a future contingent event. Changes related to current services are not offset by changes to the contractual service margin.
  - An increase in the current market interest rate decreases fulfilment cash flows but does not increase the contractual service margin.
    - The insurer recognizes a profit in profit or loss or in other comprehensive income, depending on its accounting policy choice for the portfolio of insurance contracts.
  - A decrease in the current market interest rate increases fulfilment cash flows but does not decrease the contractual service margin.
    - The insurer recognizes a loss in profit or loss or in other comprehensive income, depending on its accounting policy choice for the portfolio of insurance contracts.
  - Changes in interest rates do not affect the insurance finance expense for all years combined or the profit or loss for all years combined.

- Some insurance contracts allow the insurer discretion over the crediting rate applied to policyholder account balances. Changes stemming from the exercise of discretion relate to future services and are offset by changes to the contractual service margin. For example, the crediting rate may be the expected return on a specified pool of assets minus a margin that is left to the discretion of the insurer.
  - A change to the crediting rate stemming from a change in market interest rates does not affect the contractual service margin.
  - A change to the crediting rate based on the insurer's exercise of discretion is a change to the claim estimate (future service) is offset by a change to the contractual service margin.
  - A higher crediting rate based on the exercise of discretion raises the fulfilment cash flows (more money is paid to policyholders) and reduces the contractual service margin (but not below zero).
    - The decrease in the contractual service margin reduces the allocation to profit or loss over the current and subsequent years of the contract period.
  - A lower crediting rate based on the exercise of discretion reduces the fulfilment cash flows (less money is paid to policyholders) and raises the contractual service margin.

- The increase in the contractual service margin raises the allocation to profit or loss over the current and subsequent years of the contract period.

Changes to crediting rates by the exercise of discretion

An insurer issues an insurance contract on January 1, 20X1, with a starting account balance of 800 from the initial premium received.

- The account balance increases each year by the yield on a pool of investment grade bonds minus D. (D is the discretionary reduction in the asset return to derive the crediting rate.)
- The insurer specifies D at initial recognition, but it may change this figure at its discretion.

At initial recognition, the mortality rate is 3%, the investment yield is 7%, and D is 2%.

For simplicity, we assume constant mortality rates through the life of the insurance contract; in practice, the mortality rates vary by the age of the policyholder. We assume a flat yield curve, though the insurer may have priced the policy with a non-flat yield curve and perhaps rising or falling long-term interest rates.

At December 31, 20X1, the insurer re-estimates the mortality rate and the investment yield.

The mortality rate is an estimate related to future services.

- If the insurer re-estimates the mortality rate as 2%, the reduction in the fulfilment cash flows is offset by an increase in the contractual service margin.
- If the insurer re-estimates the mortality rate as 4%, the increase in the fulfilment cash flows is offset by a decrease in the contractual service margin (but not below zero).

The market interest rate relates to current services.

- If the current investment yield changes to 6%, the reduction in the fulfilment cash flows is related to current services and is not offset by an increase in the contractual service margin.
- If the current investment yield changes to 8%, the increase in the fulfilment cash flows is related to current services and is not offset by a decrease in the contractual service margin.

The discretionary parameter D is the offset to the investment yield to derive the crediting rate in future years.

- If the insurer changes the discretionary parameter D to 3%, the reduction in the fulfilment cash flows is related to future services and is offset by an increase in the contractual service margin.
- If the insurer changes the discretionary parameter D to 1%, the increase in the fulfilment cash flows is related to future services and is offset by a decrease in the contractual service margin.

An insurer may use its discretion to smooth changes in the crediting rate. If the crediting rate is the investment yield minus D, and the investment yield decreases 1%, the insurer may decrease D 0.4%, so the crediting rate decreases only 0.6%. The change in the investment yield is not offset by a change in the contractual service margin, but the change in the value of D is offset by a change in the contractual service margin.

Disclosure of discretionary parameters

The discretionary parameter D is not specified in the insurance contract and it is not a market variable with a known value. The distinction between changes in the expected return on the specified pool of assets and changes in the discretionary parameter D is relevant only for IFRS 17 accounting entries. The payments to policyholders do not differ if the crediting rate changes from a change in the expected return on the specified pool of assets or it changes from the insurer's exercise of discretion. To determine the IFRS 17 accounting entries, the insurer specifies at inception of the contract how it intends to determine the discretionary parameter. IFRS 17 paragraph B98 says:

> *The terms of some insurance contracts … give an entity discretion over the cash flows to be paid to policyholders. A change in the discretionary cash flows is regarded as relating to future service, and accordingly adjusts the contractual service margin. To determine how to identify a change in discretionary cash flows, an entity shall specify at inception of the contract the basis on which it expects to determine its commitment under the contract; for example, based on a fixed interest rate, or on returns that vary based on specified asset returns.*

The specification at inception of the contract enables us to distinguish changes in the investment yield or the interest rate from changes in the exercise of discretion. IFRS 17 paragraph B99 says:

> *An entity shall use that specification to distinguish between the effect of changes in assumptions that relate to financial risk on that commitment (which do not adjust the contractual service margin) and the effect of discretionary changes to that commitment (which adjust the contractual service margin).*

"Changes in assumptions that relate to financial risk" refers to changes in investment yields or market interest rates. The insurer estimates investment yields for future years, so a re-estimate is a change in assumptions.

Illustration: Changes to the discount rate with a two year coverage period

An insurer writes an insurance contract on December 31, 20X0, with a two year coverage period.

- Premium of 100 is collected on December 31, 20X0, and acquisition cash flows are zero.
- One claim of 110 is expected to be incurred and paid on December 31, 20X2.
- The annual discount rate is 8% on December 31, 20X0, and is 6% on December 31, 20X1.
- The risk adjustment for non-financial risk is zero.

The acquisition cash flows and the risk adjustment for non-financial risk are zero so that we focus on discount rates. We show

A. The fulfilment cash flows at initial recognition
B. The fulfilment cash flows right after the premium is collected
C. The contractual service margin on December 31, 20X0
D. The insurance contract liability on December 31, 20X0
E. The fulfilment cash flows on December 31, 20X1
F. The insurance finance expense for 20X1
G. The contractual service margin on December 31, 20X1
H. The insurance contract liability on December 31, 20X1
I. The insurance revenue for 20X1

Part A: The fulfilment cash flows at initial recognition = $110 / 1.08^2 - 100 = -5.69$

Part B: The fulfilment cash flows right after the premium is collected = $110 / 1.08^2 = 94.31$

Part C: The contractual service margin on December 31, 20X0, is the negative of the fulfilment cash flows at initial recognition = 5.69.

Part D: The insurance contract liability on December 31, 20X0, is the fulfilment cash flows + the contractual service margin = 94.31 + 5.69 = 100.00. At inception of the policy, the insurance contract liability for a non-onerous contract is the increase in the cash asset, which is the premium received. (For an onerous contract, the insurance contract liability at initial recognition is more than the premium received.

Part E: The fulfilment cash flows on December 31, 20X1, use the current discount rate, not the discount rate at initial recognition: $110 / 1.06^1 = 103.77$

Part F: The insurance finance expense for 20X1 has two parts.

- The fulfilment cash flows increased from 94.31 to 103.77 because of the time value of money and the change in the discount rate, so the insurance finance expense on the liability for remaining coverage = 103.77 – 94.31 = 9.47. (To four decimal places, the figure is 9.4663, which we round to 9.47.) The fulfilment cash flows use the current discount rates at each valuation date.
- The contractual service margin accretes interest at the discount rate determined at initial recognition:
  - 8% × 5.69 = 0.46 (To four decimal places, the figure is 0.4554, which we round to 0.46.)

The insurance finance expense is 9.47 + 0.46 = 9.92 (To four decimal places, the figure is 9.9217, which we round to 9.92.)

Part G: The contractual service margin on December 31, 20X1, is the contractual service margin at the previous valuation date + the accretion of interest – the allocation of profit for the year.

The contractual service margin after accretion of interest = 5.69 + 0.46 = 6.148. We show the figure to three decimal places for the allocation between 20X1 and 20X2.

The coverage units at the same for 20X1 and 20X2, so the allocated profit in 20X1 is 6.148 / 2 = 3.074.

The contractual service margin at December 31, 20X1, is 6.148 – 3.074 = 3.074.

Part H: The insurance contract liability on December 31, 20X1, is the fulfilment cash flows plus the contractual service margin = 103.77 + 3.074 = 106.85. (To five decimal places, the figure is 106.84765, which we round to 106.85.)

Part I: The insurance revenue for 20X1 is the contractual service margin allocated to 20X1 = 3.074.

The accounting entries for 20X2 follow the same format:

- The insurance finance expense on the present value of future cash flows uses the current discount rate at each valuation date.
- The accretion of interest on the contractual service margin uses the discount rate determined at initial recognition of the insurance contracts.
- The insurance revenue for 20X2 is the allocation of the contractual service margin to profit or loss plus the 20X2 incurred claim (as estimated at the beginning of the year).

WEIGHTED AVERAGE DISCOUNT RATES AT INITIAL RECOGNITION

The discount rate determined at initial recognition of the insurance contracts is used for the first year of the insurance finance expenses on the present value of future cash flows in the fulfilment cash flows and for all years of the insurance finance expense (the accretion of interest) on the contractual service margin.

The discount rate determined at initial recognition depends on the date the contract is issued. A group of insurance contracts has contracts issued on different dates. The discount rate at initial recognition of the group is a weighted average of the discount rates at initial recognition of each contract in the group.

An insurer may issue a group of insurance contracts from July 1, 20X1, through June 30, 20X2. We show first a discrete scenario, with one insurance contract issued on July 1, 20X1, and a second insurance contract issued on June 30, 20X2. For each insurance contract, premium of 100 is received at initial recognition and a death claim of 110 is expected three years after initial recognition. For simplicity, acquisition cash flows are zero and the risk adjustment for non-financial risk is zero. The claims are paid when they occur. The discount rate is 5% at July 1, 20X1, and 6% at June 30, 20X2, and it increases linearly between these two dates.

- At July 1, 20X1, the fulfilment cash flows are -100 + 110 / 1.05^3 = -4.98, the risk adjustment for non-financial risk is zero, and the contractual service margin is 4.98.
- In 20X1, the contractual service margin accretes interest of 4.98 × ($1.05^{0.5}$ – 1) = 0.12, and the contractual service margin is 4.98 + 0.12 = 5.10.

- At June 30, 20X2, the fulfilment cash flows for the second insurance contract are -100 + 110 / 1.06^3 = -7.64. the risk adjustment for non-financial risk is zero, and the contractual service margin is 7.64.
- In 20X2, the contractual service margin for the first contract accretes interest of 5.10 × 5% = 0.26 and the contractual service margin for the second contract accretes interest of 7.64 × ($1.06^{0.5}$ – 1) = 0.23.
- In 20X2, the contractual service margin accretes total interest of 0.26 + 0.23 = 0.49, or 5.10 × 5% + 7.64 × ($1.06^{0.5}$ – 1) = 0.48.

Accreting interest contract by contract is excessively complex, so IFRS 17 uses weighted averages:

- The weighted average period for the accretion of interest is (5.10 × 1 + 7.64 × 0.5) / (5.10 + 7.64) = 0.70 years.
- The contracts are the same size, so the weighted average discount rate at initial recognition is ½ × (5% + 6%) = 5.50%.
- The accretion of interest in 20X2 is (5.10 + 7.64) × ($1.055^{0.70}$ – 1) = 0.49.

The discount rate determined at initial recognition of the insurance contracts changes from 5% at December 31, 20X1, to 5.5% at December 31, 20X2.[16]

[1] See IFRS 17 *Basis for Conclusions* paragraph BC10(b)(ii): "… when applying IFRS 17, changes in financial assumptions will be recognised earlier for some insurance contracts than they would be when applying IFRS 15," and IFRS 17 *Basis for Conclusions* paragraph BC26(a)(i): "The measurement required by IFRS 17 results in the measurement of the liability for remaining coverage and the resulting profit and revenue recognition being broadly consistent with IFRS 15, except that for insurance contracts without direct participation features – the measurement is updated for changes in financial assumptions [that is, the discount rates used for present values] …"

[2] See IFRS 17 paragraph 33(b): "… the estimates of any relevant market variables are consistent with observable market prices for those variables." See also IFRS 17 *Basis for Conclusions* paragraph BC154(a): "an entity is required to use observable current market variables, such as interest rates, as direct inputs without adjustment when possible."

[3] See IFRS 17 paragraph B78(b).

[4] IFRS 17 paragraph B47 explains that "IFRS 17 does not require an entity to use a replicating portfolio technique. However, if a replicating asset or portfolio does exist for some of the cash flows that arise from insurance contracts and an entity chooses to use a different technique, the entity shall satisfy itself that a replicating portfolio technique would be unlikely to lead to a materially different measurement of those cash flows."

[5] Similarly, if the insurer accretes interest on the liability for remaining coverage of the premium allocation approach (because it has a significant financing component or because it elects to accrete interest), changes in the current discount rate do not affect the accretion of interest.

[6] IFRS 17 *Basis for Conclusions* paragraph BC44 explains that IFRS 17 requires insurers "to make the accounting policy choice for each portfolio because a key factor in making the choice will be what assets the entity regards as backing the insurance contracts. … an entity might hold financial assets measured at fair value through other comprehensive income for one portfolio, and for another portfolio, hold financial assets measured at fair value through profit or loss. Accordingly, an option applied to portfolios of insurance contracts would allow entities to reduce accounting mismatches."

[7] See IFRS 17 paragraph 87: "Insurance finance income or expenses comprises the change in the carrying amount of the group of insurance contracts arising from (a) the effect of the time value of money and changes in the time value of money; and (b) the effect of financial risk and changes in financial risk."

[8] See IFRS 17 paragraph B130(a): "a systematic allocation is an allocation of the total expected finance income or expenses of a group of insurance contracts over the duration of the group that is based on characteristics of the contracts, without reference to factors that do not affect the cash flows expected to arise under the contracts."

[9] See IFRS 17 paragraph B130(b): "[the systematic allocation] results in the amounts recognised in other comprehensive income over the duration of the group of contracts totalling zero. The cumulative amount recognised in other comprehensive income at any date is the difference between the carrying amount of the group of contracts and the amount that the group would be measured at when applying the systematic allocation."

[10] See IFRS 17 paragraph B131.

[11] See IFRS 17 paragraph B72(e)(i): "An entity shall use the following discount rates … if an entity chooses to disaggregate insurance finance income or expenses between profit or loss and other comprehensive income, to determine the amount of the insurance finance income or expenses included in profit or loss for groups of insurance contracts for which changes in assumptions that relate to financial risk do not have a substantial effect on the amounts paid to policyholders … discount rates determined at the date of initial recognition."

[12] See IFRS 17 paragraph B83: "an entity shall adjust market rates … for cash flows of insurance contracts that do not vary based on the returns on the assets in the reference portfolio, such adjustments include … excluding market risk premiums for credit risk, which are relevant only to the assets …."

[13] If the insurance contracts have direct participation features, with payments to policyholders that are linked to the fair value of a clearly identified pool of underlying assets, the contracts are measured by the variable fee approach, not the general measurement model.

[14] See IFRS 17 *Basis for Conclusions* paragraph BC190: "Some stakeholders suggested that measuring non-life insurance contracts at undiscounted amounts that ignore future inflation could provide a reasonable approximation of the value of the liability, especially for short-tail liabilities, at less cost and with less complexity than measuring such contracts at explicitly discounted amounts. However, this approach of implicitly discounting the liability makes the unrealistic assumption that two variables (claim inflation and the effect of timing) will more or less offset each other in every case. As this is unlikely, the Board concluded that financial reporting will be improved if entities estimate those effects separately."

[15] See IFRS 17 paragraph B74(c): "nominal cash flows (ie those that include the effect of inflation) shall be discounted at rates that include the effect of inflation" and paragraph B74(d) "real cash flows (ie those that exclude the effect of inflation) shall be discounted at rates that exclude the effect of inflation."

[16] See IFRS 17 paragraph 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."