The Actuarial Society of Hong Kong

WORKSHOP : FINANCIAL STATEMENT PRESENTATION

2017 Insurance IFRS Seminar

Steve Cheung

Session 17

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

Agenda

- 1.0 Product features & learning objectives
- 1.1 Define CFs & investment component
- 1.2 FCF & initial CSM calculation
- 1.3 Coverage unit definition & CSM roll forward calculation
- 1.4 IFRS 17 insurance contract liability projection
- 1.5 Insurance revenue definition
- 1.6 Directly attributable acquisition cost definition
- 1.7 SCI presentation – underwriting results
- 1.8 Insurance finance income & expense definition
- 1.9 SCI presentation – illustration
- 2.1 Non-economic experience variance
- 2.2 Non-economic assumption update
- 2.3 SCI presentation – non-economic experience variance & assumption update

1.0.1 Background: product features (given)

- Non par product
- 2-pay 5-year anticipated endowment

General description	2-pay 5-year anticipated endowment					
Level death benefit $ (same for all years)		50,000				
Annual premium $		22,000				
Year (per policy)	-	1	2	3	4	5
Surrender benefit $ (EOY)		17,600	40,700	43,340	46,310	50,000
Survival benefit $ (EOY)		-	-	-	-	50,000
Commission $		660	220			
Expense $ per policy bef sensitivity		5	5	2	2	2
Comm + Exp $ per plc aft sensitivity	-	665	225	2	2	2

- Assume survival benefit in Yr5
- Initial 100 policies

1.0.2 Background: product cash flows (given)

- Best estimate (BE) cash flows (CFs) and statutory gross profit are shown as below:

Best estimate projection / Year	-	1	2	3	4	5
No. survival (BOY)		100.0000	94.9050	92.8674	90.8280	87.8829
No. deaths (EOY)		0.1000	0.1424	0.1857	0.2271	0.2636
No. surrender (EOY)		4.9950	1.8953	1.8536	2.7180	-
No. survival (EOY)	100.0000	94.9050	92.8674	90.8280	87.8829	87.6193
Premium Income (BOY)		2,200,000	2,087,910			
Commission (BOY)		66,000	20,879	-	-	-
Expense (BOY)		500	475	186	182	176
Death Outgo (EOY)		5,000	7,118	9,287	11,354	13,182
Surrender Outgo (EOY)		87,912	77,137	80,336	125,872	-
Survival Outgo (EOY)		-	-	-	-	4,380,964
Net CF		2,040,588	1,982,302	(89,809)	(137,407)	(4,394,322)
Investment income		96,008	181,518	185,094	188,568	190,041
Change in reserve		1,967,170	2,146,217	77,202	32,715	(4,223,304)
Gross profit		169,426	17,603	18,083	18,447	19,022

Points to note:

- Under the current basis, day 1 profit can be realized immediately
- Sum of statutory gross profit = +242,580

- BE investment return: 4.5%
- Reserving basis: GPV with 10% PAD (valuation interest rate 4.05%)

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

1.0.3 Background: learning objectives

Learning objectives:

- CFs & investment component definition
- Initial measurement – profitable contract
- Coverage unit definition
- CSM roll forward calculation
- Insurance revenue definition
- Directly attributable acquisition cost definition
- SCI presentation – underwriting results
- Insurance finance income & expense definition
- SCI presentation illustration

1.1.1 Step 1 – define the CFs under IFRS 17

- Define the CFs for fulfillment cash flow calculation
  - Define the directly attributable expense: here assume 100% BE expenses
  - Define the investment component

CF projection for FCF (include only the directly attributable expense)

	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
Premium						
Commission						
Expense						
Death outgo (ins component)						
Death outgo (inv component)						
Surrender outgo						
Survival outgo						
Net CF (NCF)						

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

Learning objectives

- CFs & investment component definition

1.1.2 Step 1 – define the CFs under IFRS 17 (answer key)

- Define the CFs for fulfillment cash flow calculation
  - Define the directly attributable expense: here assume 100% BE expenses
  - Define the investment component

CF projection for FCF (include only the directly attributable expense)

	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
Premium	2,200,000	2,087,910	-	-	-	-
Commission	(66,000)	(20,879)	-	-	-	-
Expense	(500)	(475)	(186)	(182)	(176)	-
Death outgo (ins component)	-	(3,240)	(1,324)	(1,237)	(838)	-
Death outgo (inv component)	-	(1,760)	(5,794)	(8,050)	(10,516)	(13,182)
Surrender outgo	-	(87,912)	(77,137)	(80,336)	(125,872)	-
Survival outgo	-	-	-	-	-	(4,380,964)
Net CF (NCF)	2,133,500	1,973,644	(84,440)	(89,805)	(137,401)	(4,394,146)

Discussion points

- What is the investment component here?

Points to note:

- CFs are same as slide 1.0.2
- Need to split the "Death outgo" into (i) insurance component and (ii) investment component
- Investment component definition: *"The amounts that an insurance contract requires the entity to repay to a policyholder even if an insured event does not occur."*
- In this example, maximum of survival benefit and surrender benefit is assumed to be investment component
- Take Yr4 as an illustration
  - Total Death outgo = 11,354
  - Ins component = [Death benefit – Max(Survival benefit, Surrender benefit)] * No of death = (50k – 46,310) * 0.2271 = 838

Learning objectives

- CFs & investment component definition

1.2.1 Step 2 – calculate the FCF & initial CSM

- Risk adjustment (RA) – given, using simplified approach here

RA approximation						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
Amount at risk		2,500	2,373	2,322	2,271	2,197
RA	10,553	8,422	6,345	4,245	2,123	-

- Calculate the fulfilment cash flow (FCF)
- 3.5% is used as the discount rate

FCF calculation	
	Yr0
BEL	
RA	10,553
FCF	

- **Quick exercise: what is the initial CSM?**

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

Learning objectives

- Initial measurement & subsequent FCF

1.2.2 Step 2 – calculate the FCF & initial CSM (answer key)

- Risk adjustment (RA) – given, using simplified approach here

RA approximation						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
Amount at risk		2,500	2,373	2,322	2,271	2,197
RA	10,553	8,422	6,345	4,245	2,123	-

- Calculate the fulfilment cash flow (FCF)
- 3.5% is used as the discount rate

FCF calculation						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
BEL	(61,088)	2,052,035	4,178,487	4,234,919	4,245,728	-
RA	10,553	8,422	6,345	4,245	2,123	-
FCF	(50,535)	2,060,457	4,184,832	4,239,164	4,247,850	-

- **Quick exercise: what is the initial CSM?**

Discussion points

- What else approach can be used for the RA calculation?

Points to note:

- RA: assume to be given. Amount at risk each year is assumed to be 0.05% * NOP(BOY) * SA

Points to note:

- FCF = best estimate liability (BEL) + risk adjustment (RA)
- BEL = present value of the CF from slide 1.1.2

Answers:

- Initial CSM = max(-FCF, 0) = +50,535

Learning objectives

- Initial measurement & subsequent FCF

1.3.1 Step 3 – define the coverage unit & CSM roll forward calculation

- Assume BE scenario – everything goes as expected

Coverage unit projection						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
NOP (BOY)						
SA (BOY)						
Coverage unit (BOY)						

1.3.2 Step 3 – define the coverage unit & CSM roll forward calculation (answer key)

- Assume BE scenario – everything goes as expected

Coverage unit projection						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
NOP (BOY)		100.000	94.905	92.867	90.828	87.883
SA (BOY)		50,000	50,000	50,000	50,000	50,000
Coverage unit (BOY)		5,000,000	4,745,250	4,643,369	4,541,401	4,394,146

Points to note:

- Coverage unit: *"The number of coverage units in a group is the quantity of coverage provided by the contracts in the group, determined by considering for each contract the quantity of the benefits provided under a contract and its expected coverage duration."*
- Coverage unit: defined as [NOP * SA]

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

Learning objectives

- Coverage unit definition

1.3.3 Step 3 – define the coverage unit & CSM roll forward calculation

- Assume BE scenario – everything goes as expected

Coverage unit projection						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
NOP (BOY)						
SA (BOY)						
Coverage unit (BOY)						

- CSM roll forward

CSM roll forward						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
CSM (BOY)						
Interest accretion						
Amortization						
CSM (EOY)						

Learning objectives

- Coverage unit definition
- CSM roll forward calculation

1.3.4 Step 3 – define the coverage unit & CSM roll forward calculation (answer key)

- Assume BE scenario – everything goes as expected

Coverage unit projection						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
NOP (BOY)		100.000	94.905	92.867	90.828	87.883
SA (BOY)		50,000	50,000	50,000	50,000	50,000
Coverage unit (BOY)		5,000,000	4,745,250	4,643,369	4,541,401	4,394,146

Points to note:

- Coverage unit: *"The number of coverage units in a group is the quantity of coverage provided by the contracts in the group, determined by considering for each contract the quantity of the benefits provided under a contract and its expected coverage duration."*
- Coverage unit: defined as [NOP * SA]

- CSM roll forward

CSM roll forward						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
CSM (BOY)		50,535	40,332	30,382	20,327	10,165
Interest accretion		1,769	1,412	1,063	711	356
Amortization		(11,972)	(11,362)	(11,118)	(10,874)	(10,521)
CSM (EOY)	50,535	40,332	30,382	20,327	10,165	-

Answers:

- Take Yr4 as an illustration
  - CSM (BOY) assume to be given = 20,327
  - Interest accretion = 20,327 * 3.5% = 711
  - Amortization = [20,327 + 711] * 4,541,401 / [4,541,401 + 4,394,146 /1.035] = 10,874
  - CSM (EOY) = 20,327 + 711 – 10,874 = 10,165

Learning objectives

- Coverage unit definition
- CSM roll forward calculation

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

1.4.1 IFRS 17 insurance contract liability projection - breakdown

- IFRS 17 insurance contract liability projection

IFRS 17 insurance liability						
	Initial	Yr1	Yr2	Yr3	Yr4	Yr5
BEL (EOY)						
BEL NCF						
BEL interest accretion						
BEL change in assumption						
RA (EOY)						
RA interest accretion						
RA release						
RA change in assumption						
CSM (EOY)						
CSM interest accretion						
CSM release						
CSM change in assumption						
IFRS 17 insurance liability						

1.4.2 IFRS 17 insurance contract liability projection - breakdown (answer key)

- IFRS 17 insurance contract liability projection

IFRS 17 insurance liability						
	Initial	Yr1	Yr2	Yr3	Yr4	Yr5
BEL (EOY)	**(61,088)**	**2,052,035**	**4,178,487**	**4,234,919**	**4,245,728**	-
BEL NCF		2,040,588	1,982,302	(89,809)	(137,407)	(4,394,322)
BEL interest accretion		72,534	144,151	146,241	148,216	148,594
BEL change in assumption						
RA (EOY)	**10,553**	**8,422**	**6,345**	**4,245**	**2,123**	-
RA interest accretion		369	295	222	149	74
RA release		(2,500)	(2,373)	(2,322)	(2,271)	(2,197)
RA change in assumption						
CSM (EOY)	**50,535**	**40,332**	**30,382**	**20,327**	**10,165**	-
CSM interest accretion		1,769	1,412	1,063	711	356
CSM release		(11,972)	(11,362)	(11,118)	(10,874)	(10,521)
CSM change in assumption						
IFRS 17 insurance liability	**-**	**2,100,789**	**4,215,213**	**4,259,491**	**4,258,016**	**-**

Points to note:
- Take Yr1 as an illustration
  - BEL NCF = NCF(BOY) + NCF(EOY)
  - NCF(BOY) = premium income – commission – expense
    = 2.2M – 66k –0.5k = 2,133,500
  - NCF(EOY) = -death outgo – surrender outgo = -5k – 87,912 = -92,912
  - Interest accretion = [BEL(Yr0) + NCF(BOY)] * 3.5%
    = (-61,088 + 2,133,500) * 3.5% = 72,534
  - NCF details refer to slide 1.0.2

Points to note:
- Take Yr1 as an illustration
  - Interest accretion = 10,553 * 3.5% = 369
  - RA release = amount at risk pattern shown in slide 1.2.2

Points to note:
- Same as slide 1.3.4

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

1.5.1 Step 4 – define insurance revenue IR

- Define the IR

Insurance revenue (IR)						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
IR death outgo						
IR surrender outgo						
IR survival outgo						
IR attributable expense (non-AC)						
IR attributable expense (AC)						
IR RA release						
IR CSM amortization						

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

Learning objectives

- Insurance revenue definition

1.5.2 Step 4 – define insurance revenue IR (answer key)

- Define the IR

Insurance revenue (IR)						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
IR death outgo		3,240	1,324	1,237	838	-
IR surrender outgo						
IR survival outgo						
IR attributable expense (non-AC)		500	21,354	186	182	176
IR attributable expense (AC)		15,107	13,852	13,096	12,376	11,569
IR RA release		2,500	2,373	2,322	2,271	2,197
IR CSM amortization		11,972	11,362	11,118	10,874	10,521

- **What numbers are missed?**

Points to note:
- Investment component should be excluded in the revenue recognition

Answers:
- Death outgo: from slide 1.1.2 (only include the insurance component part)
- Surrender outgo & survival outgo: assumed as investment component – not included in IR
- Attributable expense (non acquisition cost): from slide 1.1.2 (all year expense + second year commission). First year commission is assumed to be directly attributable acquisition cost
- RA release: from slide 1.2.2
- CSM amortization: from slide 1.3.4

Answers:
- Attributable expense (AC) – discuss in slide 1.6.2

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

Learning objectives
- Insurance revenue definition

1.6.1 Step 5 – define the directly attributable acquisition cost (DAAC)

- Assume FY commission is the directly attributable acquisition cost & no interest

DAAC						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
Commission + Expense (BOY)						
Non-attributable						
Attributable AC						
Attributable AC amortization						
Attributable AC remaining balance						
Attributable non-AC						

Learning objectives

- Directly attributable acquisition cost definition
- Insurance revenue definition

1.6.2 Step 5 – define the directly attributable acquisition cost (DAAC) (answer key)

- Assume FY commission is the directly attributable acquisition cost & no interest

DAAC						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
Commission + Expense (BOY)		**(66,500)**	**(21,354)**	**(186)**	**(182)**	**(176)**
Non-attributable		-	-	-	-	-
Attributable AC		(66,000)				
Attributable AC amortization		(15,107)	(13,852)	(13,096)	(12,376)	(11,569)
Attributable AC remaining balance		(50,893)	(37,041)	(23,945)	(11,569)	-
Attributable non-AC		(500)	(21,354)	(186)	(182)	(176)

Points to note:

- Only assume the first year commission is the DAAC
- In this example, total of the "Attributable AC amortization" = 66,000

Answers:

- Take Yr4 as an illustration
  - DAAC remaining balance (BOY) assume to be given = 23,945
  - Amortization = 23,945 * 4,541,401 / [4,541,401 + 4,394,146/1.035] = 12,376
  - DAAC remaining balance (EOY) = 23,945 – 12,376 = 11,569
- Yr5: Last year amortization = remaining balance

Learning objectives

- Directly attributable acquisition cost definition
- Insurance revenue definition

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

1.7.1 Step 6 – SCI underwriting results

- Define the SCI underwriting results

Statement of comprehensive income						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
Underwriting result						
Insurance revenue (IR)						
IR death outgo						
IR surrender outgo						
IR survival outgo						
IR attributable expense (non-AC)						
IR attributable expense (AC)						
IR RA release						
IR CSM amortization						
Insurance service expense (ISE)						
ISE death outgo						
ISE surrender outgo						
ISE survival outgo						
ISE expense						
Losses at initial recognition						
Reserve of previously recognized losses						

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

Learning objectives

- SCI presentation – underwriting results

1.7.2 Step 6 – SCI underwriting results (answer key)

- Define the SCI underwriting results

Statement of comprehensive income						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
Underwriting result		**14,472**	**13,734**	**13,439**	**13,144**	**12,718**
Insurance revenue (IR)		**33,318**	**50,264**	**27,958**	**26,539**	**24,463**
IR death outgo		3,240	1,324	1,237	838	-
IR surrender outgo						
IR survival outgo						
IR attributable expense (non-AC)		500	21,354	186	182	176
IR attributable expense (AC)		15,107	13,852	13,096	12,376	11,569
IR RA release		2,500	2,373	2,322	2,271	2,197
IR CSM amortization		11,972	11,362	11,118	10,874	10,521
Insurance service expense (ISE)		**(18,847)**	**(36,530)**	**(14,519)**	**(13,395)**	**(11,745)**
ISE death outgo		(3,240)	(1,324)	(1,237)	(838)	-
ISE surrender outgo						
ISE survival outgo						
ISE expense		(15,607)	(35,206)	(13,282)	(12,557)	(11,745)
Losses at initial recognition		-				
Reserve of previously recognized losses						

Points to note:

- Underwriting result is the net of Insurance revenue (IR) and Insurance service expense (ISE)
- IR is a new concept under IFRS 17: *"Insurance revenue shall depict the provision of coverage and other services arising from the group of insurance contracts at an amount that reflects the consideration to which the entity expects to be entitled in exchange for those services."*

Answers:

- IR is same as slide 1.5.2

Answers:

- Death outgo: in our example, same as expected CFs from slide 1.1.2 (only include the insurance component part)
- Surrender outgo & survival outgo: assumed as investment component – not included in ISE
- Expense: in our example, same as the expected sum of (i) attributable expense (non-AC) and (ii) attributable expense (AC)

Learning objectives

- SCI presentation – underwriting results

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

1.8.1 Step 7 – IFIE definition (given)

- Define the insurance finance expense

IFRS 17 insurance liability						
	Initial	Yr1	Yr2	Yr3	Yr4	Yr5
BEL (EOY)	**(61,088)**	**2,052,035**	**4,178,487**	**4,234,919**	**4,245,728**	**-**
BEL NCF		2,040,588	1,982,302	(89,809)	(137,407)	(4,394,322)
BEL interest accretion		72,534	144,151	146,241	148,216	148,594
BEL change in assumption						
RA (EOY)	**10,553**	**8,422**	**6,345**	**4,245**	**2,123**	**-**
RA interest accretion		369	295	222	149	74
RA release		(2,500)	(2,373)	(2,322)	(2,271)	(2,197)
RA change in assumption						
CSM (EOY)	**50,535**	**40,332**	**30,382**	**20,327**	**10,165**	**-**
CSM interest accretion		1,769	1,412	1,063	711	356
CSM release		(11,972)	(11,362)	(11,118)	(10,874)	(10,521)
CSM change in assumption						
IFRS 17 insurance liability	**-**	**2,100,789**	**4,215,213**	**4,259,491**	**4,258,016**	**-**

Points to note:

- The numbers shown in this slide is same as slide 1.4.2
- Insurance finance expense = sum of (i) BEL interest accretion, (ii) RA interest accretion, and (iii) CSM interest accretion
- Take Yr2 as an illustration
  - BEL interest accretion
    = [BEL(Yr1) + NCF(BOY)] * 3.5%
    = [BEL(Yr1) + Yr2's (premium income – commission – expense)] * 3.5%
    = [2,052,035 + (2,087,910 – 20,879 – 475)] * 3.5% = 144,151
  - RA interest accretion
    = RA(Yr1) * 3.5%
    = 8,422 * 3.5% = 295
  - CSM interest accretion
    = CSM(Yr1) * 3.5%
    = 40,332 * 3.5% = 1,412

Learning objectives

- Insurance finance income & expense definition

1.9.1 Step 8 – SCI illustration

- SCI illustration (assume investment income is at 4.5%)

Statement of comprehensive income						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
Underwriting result						
Insurance revenue (IR)						
IR death outgo						
IR surrender outgo						
IR survival outgo						
IR attributable expense (non-AC)						
IR attributable expense (AC)						
IR RA release						
IR CSM amortization						
Insurance service expense (ISE)						
ISE death outgo						
ISE surrender outgo						
ISE survival outgo						
ISE expense						
Investment result						
Investment income						
Insurance finance expense						
Profit before tax						
Other comprehensive income						
Total comprehensive income						
Statutory profit						

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

Learning objectives

- SCI presentation illustration

1.9.2 Step 8 – SCI illustration (answer key)

- SCI illustration (assume investment income is at 4.5%)

Statement of comprehensive income

	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
Underwriting result		**14,472**	**13,734**	**13,439**	**13,144**	**12,718**
Insurance revenue (IR)		**33,318**	**50,264**	**27,958**	**26,539**	**24,463**
IR death outgo		3,240	1,324	1,237	838	-
IR surrender outgo						
IR survival outgo						
IR attributable expense (non-AC)		500	21,354	186	182	176
IR attributable expense (AC)		15,107	13,852	13,096	12,376	11,569
IR RA release		2,500	2,373	2,322	2,271	2,197
IR CSM amortization		11,972	11,362	11,118	10,874	10,521
Insurance service expense (ISE)		**(18,847)**	**(36,530)**	**(14,519)**	**(13,395)**	**(11,745)**
ISE death outgo		(3,240)	(1,324)	(1,237)	(838)	-
ISE surrender outgo						
ISE survival outgo						
ISE expense		(15,607)	(35,206)	(13,282)	(12,557)	(11,745)
Investment result		**21,335**	**35,661**	**37,568**	**39,492**	**41,016**
Investment income		96,008	181,518	185,094	188,568	190,041
Insurance finance expense		(74,673)	(145,857)	(147,526)	(149,076)	(149,024)
Profit before tax		**35,807**	**49,395**	**51,007**	**52,637**	**53,734**
Other comprehensive income						
Total comprehensive income		**35,807**	**49,395**	**51,007**	**52,637**	**53,734**
Statutory profit		169,426	17,603	18,083	18,447	19,022

Points to note:
- Underwriting result same as slide 1.7.2

Points to note:
- Investment income assume to be the same as statutory basis

Points to note:
- Insurance finance expense from slide 1.8.1

Points to note:
- Sum of total comprehensive income under IFRS 17 basis (assume no change in investment income) = +242,580

Learning objectives
- SCI presentation illustration

2.1.0 Background: learning objectives

- 2-pay 5-year anticipated endowment (same product)
- What if there are non economic experience variance?
- At the end of Yr2, an experience variance on mortality (+1 death) is noted

Learning objectives:

- Impact on CSM due to non economic experience variance

2.1.1 CF projection for FCF calculation

- Define the CFs for FCF calculation
- Experience variance only

CF projection for FCF (include only the directly attributable expense)

	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
Premium						
Commission						
Expense						
Death outgo (ins component)						
Death outgo (inv component)						
Surrender outgo						
Survival outgo						
Net CF (NCF)						

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

2.1.2 CF projection for FCF calculation (answer key)

- Define the CFs for FCF calculation
- Experience variance only

CF projection for FCF (include only the directly attributable expense)

	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
Premium	2,200,000	2,087,910	-	-	-	-
Commission	(66,000)	(20,879)	-	-	-	-
Expense	(500)	(475)	(184)	(180)	(174)	-
Death outgo (ins component)	-	(3,240)	(10,624)	(1,224)	(829)	-
Death outgo (inv component)	-	(1,760)	(46,494)	(7,965)	(10,405)	(13,043)
Surrender outgo	-	(87,912)	(76,323)	(79,489)	(124,544)	-
Survival outgo	-	-	-	-	-	(4,334,733)
Net CF (NCF)	2,133,500	1,973,644	(133,624)	(88,857)	(135,951)	(4,347,776)

Points to note:
- Impacts when comparing to slide 1.1.2:
  - Additional 1 policyholder dead, i.e. 50k extra is paid in Yr2
  - Other CFs like expense, survival outgo (Yr3-5) will be impacted as well due to no. of policies changed

Points to note:
- Actual CFs

2.1.3 Impact on CSM due to non economic experience variance

- FCF after experience variance only

FCF calculation						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
BEL						
RA						
FCF						

CSM roll forward						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
CSM (BOY)						
Interest accretion						
Experience adjustment						
Assumption change (non econ)						
Assumption change (econ)						
Amortization						
CSM (EOY)						

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

Learning objectives

- Impact on CSM due to non economic experience variance

2.1.4 Impact on CSM due to non economic experience variance (answer key)

- FCF after experience variance only

Points to note:
- Experience variance happened in Yr2, so no change to initial and Yr1 results (same as slide 1.2.2 and 1.4.2)

FCF calculation						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
BEL	(61,088)	2,052,035	4,134,393	4,190,229	4,200,924	-
RA	10,553	8,422	6,278	4,200	2,100	-
FCF	(50,535)	2,060,457	4,140,671	4,194,429	4,203,024	-

Points to note:
- BEL & RA are recalculated based on the updated CFs shown on slide 2.1.2
- Impacts when comparing to slide 1.4.2:
  - BEL decreased from 4,178,487 by 44,094
  - RA decreased from 6,345 by 67

CSM roll forward						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
CSM (BOY)		50,535	40,332	33,396	22,344	11,174
Interest accretion		1,769	1,412	1,169	782	391
Experience adjustment		-	4,275	-	-	-
Assumption change (non econ)						
Assumption change (econ)						
Amortization		(11,972)	(12,622)	(12,221)	(11,952)	(11,565)
CSM (EOY)	50,535	40,332	33,396	22,344	11,174	-

Points to note:
- The reduction of BEL & RA of 44,161 is the experience variance relate to future service. Change in death outgo (inv) & surrender outgo of Yr2 (advance payment of 39,886 investment component) will also impact CSM.
- CSM amortization is performed after the experience variance impact, it is increased when comparing to slide 1.3.4

Learning objectives
- Impact on CSM due to non economic experience variance

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

2.2.0 Background: learning objectives

- 2-pay 5-year anticipated endowment (same product)
- After non economic experience variance (as discussed in 2.1), mortality assumption for Yr3-Yr5 is also assumed to be +200% accordingly

Learning objectives:

- Impact on SCI/ CSM due to non economic assumption change
- SCI presentation illustration

2.2.1 CF projection for FCF calculation

- Define the CFs for FCF calculation
- Experience variance & assumption update

CF projection for FCF (include only the directly attributable expense)

	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
Premium						
Commission						
Expense						
Death outgo (ins component)						
Death outgo (inv component)						
Surrender outgo						
Survival outgo						
Net CF (NCF)						

2.2.2 CF projection for FCF calculation (answer key)

- Define the CFs for FCF calculation
- Experience variance & assumption update

CF projection for FCF (include only the directly attributable expense)

	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
Premium	2,200,000	2,087,910	-	-	-	-
Commission	(66,000)	(20,879)	-	-	-	-
Expense	(500)	(475)	(184)	(179)	(172)	-
Death outgo (ins component)	-	(3,240)	(10,624)	(3,672)	(2,477)	-
Death outgo (inv component)	-	(1,760)	(46,494)	(23,894)	(31,089)	(38,778)
Surrender outgo	-	(87,912)	(76,323)	(79,170)	(123,423)	-
Survival outgo	-	-	-	-	-	(4,269,866)
Net CF (NCF)	2,133,500	1,973,644	(133,624)	(106,915)	(157,161)	(4,308,644)

Points to note:
- Revised CF projection starting from Yr3

Points to note:
- Impacts when comparing to slide 1.1.2:
  - Additional 1 policyholder dead, i.e. 50k extra is paid in Yr2
  - Total death outgo is around 3 times of the original one (Yr3-5)
  - Other CFs like expense, survival outgo (Yr3-5) will be impacted as well due to no. of policies changed

Points to note:
- Actual CFs

2.2.3 Impact on CSM due to non economic assumption change

- FCF after experience variance & assumption update

FCF calculation						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
BEL						
RA						
FCF						

CSM roll forward						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
CSM (BOY)						
Interest accretion						
Experience adjustment						
Assumption change (non econ)						
Assumption change (econ)						
Amortization						
CSM (EOY)						

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

Learning objectives

- Impact on SCI/ CSM due to non economic assumption change

2.2.4 Impact on CSM due to non economic assumption change (answer key)

- FCF after experience variance & assumption update

Points to note:
- Experience variance & assumption update happened in Yr2, so no change to initial and Yr1 results (same as slide 1.2.2 and 1.4.2)

FCF calculation						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
BEL	(61,088)	2,052,035	4,136,345	4,174,191	4,163,114	-
RA	10,553	8,422	6,252	4,173	2,081	-
FCF	(50,535)	2,060,457	4,142,597	4,178,364	4,165,195	-

Points to note:
- BEL & RA are recalculated based on the updated CFs shown on slide 2.2.2
- Impacts when comparing to slide 2.1.4:
  - BEL increased from 4,134,393 by 1,952
  - RA decreased from 6,278 by 26

CSM roll forward						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
CSM (BOY)		50,535	40,332	31,962	21,336	10,642
Interest accretion		1,769	1,412	1,119	747	372
Experience adjustment		-	4,275	-	-	-
Assumption change (non econ)		-	(1,926)	-	-	-
Assumption change (econ)						
Amortization		(11,972)	(12,130)	(11,745)	(11,441)	(11,014)
CSM (EOY)	50,535	40,332	31,962	21,336	10,642	-

Points to note:
- The further change of BEL & RA from slide 2.1.4 is the net assumption change impact relate to future service. The net change will cause a negative CSM impact
- CSM amortization is performed after the assumption change impact, it is decreased when comparing to slide 2.1.4

Learning objectives
- Impact on SCI/ CSM due to non economic assumption change

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

2.3.1 SCI illustration

- Experience variance & assumption update

Statement of comprehensive income						
	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
Underwriting result						
Insurance revenue (IR)						
IR death outgo						
IR surrender outgo						
IR survival outgo						
IR attributable expense (non-AC)						
IR attributable expense (AC)						
IR RA release						
IR CSM amortization						
Insurance service expense (ISE)						
ISE death outgo						
ISE surrender outgo						
ISE survival outgo						
ISE expense						
Investment result						
Investment income						
Insurance finance expense						
Profit before tax						
Other comprehensive income						
Total comprehensive income						
Statutory profit						

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

Learning objectives

- SCI presentation illustration

2.3.2 SCI illustration (answer key)

- Experience variance & assumption update

Statement of comprehensive income

	Yr0	Yr1	Yr2	Yr3	Yr4	Yr5
Underwriting result		**14,472**	**5,203**	**14,042**	**13,678**	**13,169**
Insurance revenue (IR)		**33,318**	**51,182**	**30,995**	**28,662**	**24,808**
IR death outgo		3,240	1,324	3,672	2,477	-
IR surrender outgo						
IR survival outgo						
IR attributable expense (non-AC)		500	21,354	184	179	172
IR attributable expense (AC)		15,107	14,001	13,098	12,327	11,467
IR RA release		2,500	2,373	2,297	2,238	2,154
IR CSM amortization		11,972	12,130	11,745	11,441	11,014
Insurance service expense (ISE)		**(18,847)**	**(45,979)**	**(16,953)**	**(14,984)**	**(11,639)**
ISE death outgo		(3,240)	(10,624)	(3,672)	(2,477)	-
ISE surrender outgo						
ISE survival outgo						
ISE expense		(15,607)	(35,355)	(13,282)	(12,506)	(11,639)
Investment result		**21,335**	**35,661**	**37,038**	**38,847**	**40,195**
Investment income		96,008	181,518	183,141	185,831	186,343
Insurance finance expense		(74,673)	(145,857)	(146,103)	(146,983)	(146,148)
Profit before tax		**35,807**	**40,864**	**51,080**	**52,526**	**53,363**
Other comprehensive income						
Total comprehensive income		**35,807**	**40,864**	**51,080**	**52,526**	**53,363**
Statutory profit		169,426	17,603	18,083	18,447	19,022

Points to note:
- Experience variance & assumption change happened in Yr2, so no change to Yr1 result (same as slide 1.9.2)

Discussion points
- What are the changes involved in order to get this SCI? Coverage unit, DAAC, CSM, IFIE, etc…

Points to note:
- Impacts on underwriting result when comparing to slide 1.9.2:
  - IR death outgo: same in Yr2 as this is an expected figure. Yr3-5 figures are almost triple due to assumption change
  - Attributable acquisition cost amortization change due to the change in NOP and hence the coverage unit (more service is provided earlier now): total of all amortization is still 66k (same as slide 1.6.2)
  - CSM amortization: same as slide 2.2.4
  - ISE death outgo: Yr2 increased by 9.3k. Yr3-5 are same as IR death outgo
  - ISE expense: changed due to IR expense
  - Other items are changed slightly mainly due to the NOP changes

Points to note:
- Investment income is calculated base on Net CF & stat reserve (assume no change in stat reserve)
- Insurance finance expense decreased due to reduction of BEL & RA

Learning objectives
- SCI presentation illustration

ACTUARIAL SOCIETY of HONG KONG 香港精算學會

The Actuarial Society of Hong Kong

International Financial Reporting Standards for Insurers - IFRS 17

Presentation (Workshop) – with answer key

2017 Insurance IFRS Seminar

Steve Cheung

Session 17

ACTUARIAL SOCIETY of HONG KONG 香港精算學會