Model: n/a

Problem Type: IFRS-17 Fulfillment Cash Flow (FCF)

Find   Calculate the fulfillment cash flows for issue years 2021 - 2025 as at Dec 31, 2025.

Given   Assume the risk adjustment applied to <u>issue year</u> discounted cash flows   =   0.08

AY	undiscnt'd liabilities
2021	0
2022	700
2023	3,500
2024	5,950
2025	6,490

maturity date	risk-free rate	liquidity premium
2026-06-30	1.66%	0.69%
2027-06-30	1.73%	0.78%
2028-06-30	1.83%	0.89%
2029-06-30	1.92%	0.99%
2030-06-30	2.04%	1.08%

<==   *Excel exhibits in appendix*
          call this: "illiquidity premium"

age	projected cash flow as % of undiscounted liabilities					total
	2026	2027	2028	2029	2030	
60	100%	--	--	--	--	100%
48	100%	--	--	--	--	100%
36	50%	50%	--	--	--	100%
24	55%	30%	15%	--	--	100%
12	40%	30%	15%	15%	--	100%

Step 1a   use a bottom-up approach to calculate a selected <u>discount rate</u> for each year   = (risk-free rate) + (liquidity premium)

maturity date	(1) risk-free rate	(2) liquidity premium	(1) + (2) discount rates	
2026-06-30	1.66%	0.69%	2.35%	<== *this discount rate forms part of the yield curve*
2027-06-30	1.73%	0.78%	2.51%	<== *this discount rate forms part of the yield curve*
2028-06-30	1.83%	0.89%	2.72%	<== *this discount rate forms part of the yield curve*
2029-06-30	1.92%	0.99%	2.91%	<== *this discount rate forms part of the yield curve*
2030-06-30	2.04%	1.08%	3.12%	<== *this discount rate forms part of the yield curve*

Step 1b   calculate the discount factors for each payment period

	2026	2027	2028	2029	2030		
yield curve	2.35%	2.51%	2.72%	2.91%	3.12%		
timing	0.5	1.5	2.5	3.5	4.5	<==	
discount factor	0.9885	0.9635	0.9351	0.9045	0.8709	<==	$(1 + \text{yield curve})^{-\text{timing}}$

Step 2a   calculate projected cash flows using the given projected cash flow percentages

AY	2026	2027	2028	2029	2030	total	
2021	0	0	0	0	0	0	<== *allocate total to payment years*
2022	700	0	0	0	0	700	*based on payment pattern*
2023	1,750	1,750	0	0	0	3,500	
2024	3,273	1,785	892	0	0	5,950	
2025	2,596	1,947	974	974	0	6,490	
total	8,319	5,482	1,866	974	0	16,640	

Step 2b   allocate projected cash flows to <u>issue year</u> AND calculate <u>discounted</u> cash flows

issue yr	2026	2027	2028	2029	2030	discnt'd	
2021	350	0	0	0	0	346.0	<== *sum-product of issue year allocation*
2022	1,225	875	0	0	0	2,053.9	*and yield curve*
2023	2,511	1,768	446	0	0	4,602.5	
2024	2,934	1,866	933	487	0	6,011.0	
2025	1,298	974	487	487	0	3,116.4	
total	8,319	5,482	1,866	974	0	16,129.8	

* for 2021-2024:   issue year allocation = average of (current row, next row) from Step 2a
* for 2025:   issue year allocation = 0.5 x (projected undiscounted cash flow from Step 2a)

Step 3   calculate the final FCFs (Fulfillment Cash Flows)   =   discounted cash flows + risk adjustment

issue yr	discnt'd cash flows	risk adj. *	FCFs	
2021	346.0	27.7	373.6	<== *final answers*
2022	2,053.9	164.3	2,218.2	<== *final answers*
2023	4,602.5	368.2	4,970.7	<== *final answers*
2024	6,011.0	480.9	6,491.8	<== *final answers*
2025	3,116.4	249.3	3,365.7	<== *final answers*
total	16,129.8	1,290.4	17,420.1	

* risk adjustment =   0.08   x   (issue year discounted cash flows)

Model: n/a

Problem Type: IFRS-17 Fulfillment Cash Flow (FCF)

Find   Calculate the fulfillment cash flows for issue years 2021 - 2025 as at Dec 31, 2025.

Given   Assume the risk adjustment applied to <u>issue year</u> discounted cash flows   =   0.04

AY	undiscnt'd liabilities
2021	0
2022	800
2023	3,200
2024	3,840
2025	4,190

maturity date	risk-free rate	liquidity premium
2026-06-30	1.66%	0.68%
2027-06-30	1.74%	0.82%
2028-06-30	1.84%	0.88%
2029-06-30	1.95%	1.02%
2030-06-30	2.04%	1.09%

<== *Excel exhibits in appendix*
call this: "illiquidity premium"

age	projected cash flow as % of undiscounted liabilities					total
	2026	2027	2028	2029	2030	
60	100%	--	--	--	--	100%
48	100%	--	--	--	--	100%
36	60%	40%	--	--	--	100%
24	55%	30%	15%	--	--	100%
12	35%	30%	20%	15%	--	100%

Step 1a   use a bottom-up approach to calculate a selected <u>discount rate</u> for each year   = (risk-free rate) + (liquidity premium)

	(1)	(2)	(1) + (2)		
maturity date	risk-free rate	liquidity premium	discount rates		
2026-06-30	1.66%	0.68%	2.34%	<==	*this discount rate forms part of the yield curve*
2027-06-30	1.74%	0.82%	2.56%	<==	*this discount rate forms part of the yield curve*
2028-06-30	1.84%	0.88%	2.72%	<==	*this discount rate forms part of the yield curve*
2029-06-30	1.95%	1.02%	2.97%	<==	*this discount rate forms part of the yield curve*
2030-06-30	2.04%	1.09%	3.13%	<==	*this discount rate forms part of the yield curve*

Step 1b   calculate the discount factors for each payment period

	2026	2027	2028	2029	2030		
yield curve	2.34%	2.56%	2.72%	2.97%	3.13%		
timing	0.5	1.5	2.5	3.5	4.5	<==	
discount factor	0.9885	0.9628	0.9351	0.9026	0.8705	<==	(1 + yield curve)^(-timing)

Step 2a   calculate projected cash flows using the given projected cash flow percentages

AY	2026	2027	2028	2029	2030	total		
2021	0	0	0	0	0	0	<==	*allocate total to payment years*
2022	800	0	0	0	0	800		*based on payment pattern*
2023	1,920	1,280	0	0	0	3,200		
2024	2,112	1,152	576	0	0	3,840		
2025	1,467	1,257	838	629	0	4,190		
total	6,299	3,689	1,414	629	0	12,030		

Step 2b   allocate projected cash flows to <u>issue year</u> AND calculate <u>discounted</u> cash flows

issue yr	2026	2027	2028	2029	2030	discnt'd		
2021	400	0	0	0	0	395.4	<==	*sum-product of issue year allocation*
2022	1,360	640	0	0	0	1,960.5		*and yield curve*
2023	2,016	1,216	288	0	0	3,432.9		
2024	1,789	1,205	707	314	0	3,873.1		
2025	733	629	419	314	0	2,005.4		
total	6,299	3,689	1,414	629	0	11,667.4		

* for 2021-2024:   issue year allocation = average of (current row, next row) from Step 2a

* for 2025:   issue year allocation = 0.5 x (projected undiscounted cash flow from Step 2a)

Step 3   calculate the final FCFs (Fulfillment Cash Flows)   =   discounted cash flows + risk adjustment

issue yr	discnt'd cash flows	risk adj. *	FCFs		
2021	395.4	15.8	411.2	<==	*final answers*
2022	1,960.5	78.4	2,039.0	<==	*final answers*
2023	3,432.9	137.3	3,570.2	<==	*final answers*
2024	3,873.1	154.9	4,028.1	<==	*final answers*
2025	2,005.4	80.2	2,085.6	<==	*final answers*
total	11,667.4	466.7	12,134.1		

* risk adjustment =   0.04   x   (issue year discounted cash flows)