Reading: Odomirok.25-Solv2   (Solvency II - 2017.Spring Q20) a-Question
Model: 2017.Spring #20
Problem Type: solvency 2 capital requirement & regulatory action

Given

IFRS assets	850

free surplus	?
SCR	?
MCR	250
risk margin	?
best est. liabs	150

risk-free rate	0.625%	
illiquidity premium	0.250%	
cost-of-capital		
above risk-free rate	6.000%	= (R - i)

* Capital is held until the <u>end</u> of the year.

* Loss payments are expected to occur this many years:	3

  (Assume payments are <u>mid</u> -year)

* These are the Value-at-Risk model results:

  (Assume SCR values are constant for all

   future years.)

percentile	VaR
95.0%	150
99.0%	200
99.5%	300
99.9%	550

Find   Calculate the following under the Solvency II framework:

    (a)   SCR

    (b)   risk margin

    (c)   regulator action

    (d)   free surplus

Calculating SCR is trivial. You just have to know to use the 99.5th percentile in the model results

SCR	=	300	<== part (a)

The hard part is calculating the risk margin. Once we have that, the rest is easy.

The number of columns in our table equals the number of years loss payments are expected to occur: 3

		year 1	year 2	year 3	
(1)	SCR = required capital	300	300	300	
(2)	(R - i) = risk cost-of-capital	6.000%	6.000%	6.000%	
(1) x (2)	cost-of-capital in period	18.00	18.00	18.00	
(4)	duration	1	2	3	
(5)	discount rate	0.875%	0.875%	0.875%	
(6)	discounted cost-of-capital	17.84	17.69	17.54	

The risk margin is the sum of the values in row (6) =	53.07	<== part (b)

The boundaries for ragulator action are:

(best est.) + margin + SCR	=	150	+	53.07	+	300	=	503.07

(best est.) + margin + MCR	=	150	+	53.07	+	250	=	453.07

The IFRS assets available	=	*850*	<== *given in the statement of the problem*

The assets available are **above SCR level**

Regulator action:	**no action**	<== part (c)

And the free surplus
	=	assets available	-	SCR	-	margin	-	best est.
	=	850	-	300	-	53	-	150
free surplus	=	346.9	<== part (d)					