

**Paper:** Odo.FinReg  
**Problem:** Practice  
**Problem Type:** Calculate PV(commuted claims), WITH risk margin

**Notation:** TMF = Total Margin Factor

**Concept:** TMF = (req'd margin) x (target cap to req'd ratio) x (risk cost of capital)

**Given:** All information is as at yr-end: 2016

undiscounted liabilities to be commuted:	4,000
risk-free rate:	2.0%
required margin:	10%
target capital to required ratio:	200%
risk cost of capital:	10%

calendar yr pmt patterns:

2017	50%
2018	100%
2019	100%
2020	100%

**Assume:** All pmts are made in the middle of the year

PV(with margin) = 4,039

**PV(w/o margin):**

*that's why the exponents for the margin are integers*

**margin:**

TMF = 2.00%

	% paid in year (1)	4,000 x (1) = (2)	# yrs to discount (3)	discount @ 2% (4)	pmt rem @ beg yr (5)	TMF x (5) = (6)	# yrs to discount (7)	discount @ 2% (8)
2017	50%	2,000	0.5	1,980	4,000	80	1	78
2018	50%	2,000	1.5	1,941	2,000	40	2	38
2019	0%	0	2.5	0	0	0	3	0
2020	0%	0	3.5	0	0	0	4	0
				3,922				117

**Note 1:** The (# of yrs to discount) is DIFFERENT for calc'ing the PV(w/o margin) and the corresponding margin. Refer to columns (3) and (7).

**Note 2:** Think of (6) as the "cost of capital". The intermediate steps are:  
 req'd margin = (5) x req'd margin  
 target capital = (5) x req'd margin x (target capital to req'd RATIO)  
 cost of capital = (5) x req'd margin x (target capital to req'd RATIO) x risk cost of capital