Reading: Werner 13: Other Considerations
Model: 2013.Spring #10
Problem Type: Lifetime Value Analysis

Find Calculate the lifetime value of the expected profit as a percentage of premium

Given

premium: year 1	2,000
premium: year 2	2,160
premium: year 3	2,080
new business expected LR	60%
annual decrease in losses	40
expenses - new business	720
expenses - renewal business	600
prob(1st renewal)	92%
prob(2nd renewal)	78%
prob(3rd renewal)	0%
annual discount rate	4%

Step 1 complete the following table

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
year	premium	loss	expense	persistency	cumulative persistency	discount factor	PV profit	PV premium
1	2,000	1,200	720	100.0%	100.0%	1.0000	80.00	2,000.00
2	2,160	1,160	600	92.0%	92.0%	0.9615	353.85	1,910.77
3	2,080	1,120	600	78.0%	71.8%	0.9246	238.85	1,380.00
						totals ====>	672.69	5,290.77

(1) = given
(2) = start at (premium: year 1) x 60% then decrease by 40 per year
(3) = use 'new business' expenses for year 1, then 'renewal expenses' for years 2 & 3
(4) = given
(5) = product of current & prior values of (Col 4)
(6) = 1 / (1 + discount rate) ^ (year -1)
(7) = [(1) - (2) - (3)] x (5) x (6)
(8) = (1) x (5) x (6)

Step 2 calculate the % profit

% profit	=	total PV(profit)	/	total PV(premium)
	=	672.69	/	5,290.77
	=	12.71%	*<==== final answer*	

Reading: Werner 13: Other Considerations
Model: 2013.Spring #10
Problem Type: Lifetime Value Analysis

Find Calculate the lifetime value of the expected profit as a percentage of premium

Given

premium: year 1	1,300
premium: year 2	1,340
premium: year 3	1,400
new business expected LR	70%
annual decrease in losses	50
expenses - new business	572
expenses - renewal business	286
prob(1st renewal)	90%
prob(2nd renewal)	78%
prob(3rd renewal)	0%
annual discount rate	4%

Step 1 complete the following table

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
year	premium	loss	expense	persistency	cumulative persistency	discount factor	PV profit	PV premium
1	1,300	910	572	100.0%	100.0%	1.0000	-182.00	1,300.00
2	1,340	860	286	90.0%	90.0%	0.9615	167.88	1,159.62
3	1,400	810	286	78.0%	70.2%	0.9246	197.31	908.65
						totals ====>	183.19	3,368.27

(1) = given
(2) = start at (premium: year 1) x 70% then decrease by 50 per year
(3) = use 'new business' expenses for year 1, then 'renewal expenses' for years 2 & 3
(4) = given
(5) = product of current & prior values of (Col 4)
(6) = 1 / (1 + discount rate) ^ (year -1)
(7) = [(1) - (2) - (3)] x (5) x (6)
(8) = (1) x (5) x (6)

Step 2 calculate the % profit

% profit	=	total PV(profit)	/	total PV(premium)
	=	183.19	/	3,368.27
	=	5.44%	*<==== final answer*	