

ROBBIN: PAST CAS EXAMINATION QUESTIONSC. Calendar Year Return-on-Equity Method

C1. You are given the following information:

Pretax portfolio yield	9%	Premium-to-surplus ratio	3.0
Premium-to-equity ratio	2.5	Variable expense to premium	25%
Permissible loss ratio	60%	Earned premium	\$100,000
Traditional underwriting profit	5%	Average unearned premium	\$30,000
ROE target	15%	Average premium receivable	\$18,000
Loss reserves to losses incurred	1.20	Historical loss ratio	63%
Prepaid expense ratio	18%	Fixed expense	\$15,000

The tax rate for both underwriting and investment income is 34%. Using the methods described by Robbin in the study note "The Underwriting Profit Provision," calculate the underwriting profit provision based on the calendar year return-on-equity (ROE) method. (93-6-39b-2)

C2. According to Robbin, in "The Underwriting Profit Provision," which of the following are advantages of the calendar year return-on-equity method?

- The figures used in the calculations are published in the Insurance Expense Exhibit and in the Annual Statement.
- The method produces a return on equity that is comparable to the GAAP return on equity used to measure profitability in many industries.
- The method is not biased by changes to loss reserve adequacy.

A. 1 B. 2 C. 1,2 D. 1,3 E. 1,2,3 (95-6-21-1)

C3. You are given:

Direct earned premium	\$100,000	Average direct unearned premium	\$40,000
Prepaid acquisition expense ratio	20%	Average premiums receivable	\$20,000
Average loss reserves (last 3 years)	\$84,000	Target return on equity	15%
Average incurred losses (last 3 years)	\$72,000	Permissible loss ratio	60%
Pretax portfolio yield	10%	After-tax portfolio yield	7%
Tax rate on underwriting income	35%	Surplus = equity	\$50,000

Based on Robbin's "The Underwriting Profit Provision," use the calendar year return-on-equity method to calculate the underwriting profit provision. (97-6-39b-2)

C4. Using the calendar year return-on-equity procedure described by Robbin in "The Underwriting Profit Provision," calculate the return on equity.

Direct earned premium	\$80,000	Incurred losses	\$52,000
Fixed expenses	\$10,000	Variable expenses as a % of premium	25%
Policyholder-supplied funds	\$64,000	Premium-to-surplus ratio	3.0
Premium-to-equity ratio	2.5	Pretax investment yield	10%
Income tax rate (on all income)	34%		

C5. According to Robbin, in "The Underwriting Profit Provision," one advantage of the calendar year return-on-equity method is that the figures used in the calculation are published in the Insurance Expense Exhibit and the Annual Statement. (99-6-4-.5)

Robbin

C1.  $QSR = PSR / (\text{Premium-to-Equity Ratio}) = 3.0 / 2.5 = 1.2$

$PHSF = .786$

$$U = \left[ \frac{1}{1 - t_u} \right] \left[ \frac{(r)(QSR)}{PSR} - (i_{AFIT}) \left( PHSF + \frac{1}{PSR} \right) \right]$$

$U = [1 / (1 - .34)] [ (.15)(1.2/3.0) - (.09)(1 - .34)(.786 + 1/3.0) ] = -.01,$   
pp. 24–25, exhibits 2, 4.

- C2. 1. T, p. 25  
2. T, p. 25  
3. F, p. 25 – It is biased by such changes.

Answer: C

C3.  $PSR = 100,000 / 50,000 = 2$        $PHSF = .82$

$$U = \left[ \frac{1}{1 - t_u} \right] \left[ \frac{(r)(QSR)}{PSR} - (i_{AFIT}) \left( PHSF + \frac{1}{PSR} \right) \right]$$

$U = [1 / (1 - .35)] [ (.15)(1/2) - (.07)(.82 + 1/2) ] = -.027,$  p. 25, exhibits 2, 4.

C4. See exhibit 4:

1.	Premium	80,000
2.	Loss	52,000
3.	Fixed expense	10,000
4.	Variable expense: (1.)(.25)	20,000
5.	U/W gain: 1. - (2. + 3. + 4.)	-2,000
6.	U/W gain after-tax: (5.)(1 - .34)	-1,320
7.	Policyholder-supplied funds	64,000
8.	Surplus: 1./3	26,667
9.	Investable funds: 7. + 8.	90,667
10.	Investment income: (9.)(.10)	9,067
11.	Investment income AFIT: (10.)(1 - .34)	5,984
12.	Total net income: 6. + 11.	4,664
13.	Equity: 1./2.5	32,000
14.	Return on equity: 12./13.	14.6%

C5. T, p. 25.