

EXAM 6 – UNITED STATES, FALL 2012

17. (2.75 points)

A property and casualty insurer wrote only two lines of business in 2010 and 2011: Private Passenger Automobile Liability (PPA-Liability) and Commercial Auto Liability. The data below is from the company's 2010 and 2011 Insurance Expense Exhibit (IEE) (all figures are in thousands of dollars).

	2010	2011
Net Investment Income	1,625	475
Realized Capital Gain		19,200
Unrealized Capital Gain	12,000	15,000
Policyholders' Surplus	94,000	88,800

	PPA-Liability		Total	
	2010	2011	2010	2011
Prepaid Expenses Incurred	24,980	33,650	52,880	61,400
Net General Expense Incurred	3,360	4,500	6,760	8,600
Dividend to Policyholders During the Year	420	500	670	810
Net Loss & LAE Incurred During the Year	42,400	41,700	77,700	78,200
Net Premiums Written During the Year	73,800	60,600	150,700	116,800
Net Premiums Earned During the Year	72,300	68,200	147,500	131,500
Net Loss & LAE Reserves at Year-end	21,900	33,300	44,600	64,300
Unearned Premium Reserves at Year-end	41,900	36,700	85,500	70,800
Agents' Balances at Year-end	8,400	19,600	17,200	37,800
Other Income Less Other Expenses	0	0	0	0

The following information was derived from the information above:

- Investment gain on funds attributable to insurance transactions for PPA-Liability in 2011 is 3,112.
- Investment gain on funds attributable to capital and surplus for PPA-Liability in 2011 is 6,867.

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17. (continued)

a. (1.25 points)

Calculate the IEE's Total Profit (or Loss) for PPA-Liability in 2011.

b. (0.5 point)

Describe one use of the IEE's Total Profit (or Loss) for a given line of business for the insurance company's internal stakeholders.

c. (1 point)

Relying solely on the company's IEE results, the company's regulator has determined that the company's PPA-Liability rates are barely adequate.

Explain why it may not be appropriate to rely fully on the IEE to determine rate adequacy of a line of business, and propose a more appropriate measure of profitability to the regulator.

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## 17) Sample Answer

### Answer 1

$$\text{A) total inv gain} = 3112 + 6867 = 9979$$

$$\text{EP} = 68200$$

$$\text{Inc loss} + \text{LAE} = 41700$$

$$\begin{aligned} \text{Total expenses} &= \text{prepaid} + \frac{1}{2} \text{ general (1/2 general already included in prepaid)} \\ &= 33650 + \frac{1}{2}(4500) = 35900 \end{aligned}$$

$$\text{Dividends} = 500$$

$$\text{Total profit} = 68200 + 9979 - (41700 + 35900 + 500) = 79$$

B) In deciding whether a given line is profitable, it is important to look at all related income and expenses. Therefore stockholders could use this calc for that purpose.

C) The IEE allocates investment income to LOB by formula which may not be accurate or appropriate. For example, a LOB with hurricane exposure will need (and in practice) have more surplus (and therefore, inv. inc.) than the formula provides.

Look instead at internal risk models that more appropriately allocate surplus and investment income.

### Answer 2

$$\text{A) } 68200 - 33650 - .5(4500) - 500 - 41700 + 3112 + 6867 = 79$$

$$\text{EP} \quad \Delta \text{ pexp} \quad \text{gen exp} \quad \text{div} \quad \text{inc loss} \quad \text{inv gains}$$

B) Allocates profit/(loss) to line so that internally we can get a better picture of how profitable we are by line, which we can't entirely do with just underwriting results.

C) The IEE allocates surplus to line based on EP for the year, prem loss & LAE reserves and even UEPR. This may not be appropriate for some lines that are volatile in loss or are short-tail but have large losses, or vice versa. Plus it is retrospective. Instead, an actuary should determine the surplus that should be held for a line based on its projected reserves and other characteristics, and determine the investment yield on that to get the indicated rates.

### Answer 3

$$\text{A) Total Inv Gain} = 3112 + 6867 = 9979$$

$$\text{Total Profit/Loss} = 68200 - 33650 - \frac{1}{2}(4500) - 500 - 41700 + 9979 = 79$$

$$\begin{array}{ccccccc} \text{EP} & \text{PPE} & \text{need to} & + & \text{PH} & \text{loss \&} & \text{inv. inc} \\ & & \text{back in} & \frac{1}{2} & \text{div} & \text{LAE} & \\ & & & & \text{gen exp} & & \end{array}$$

B) See if line of business is meeting target profit; if not may need to revise rates.

C) IEE method uses retrospective measures to assign surplus and inv income to a line of business. If there is a change in the mix of business the retro allocation of IEE may not be appropriate. A more appropriate measure of profitability would be look at insurer's calculation of required return on capital for that line. Looks at prospective measures included in new business rates, not retro measures of IEE method.

## Examiner's Report – Q17

- a) Candidates generally performed well on this part, though very few received full credit. The most common error was incorrectly calculating the Total Expenses. Most candidates either included all general expenses or excluded them completely. Less than 10% of candidates correctly excluded one-half of the Net General Expenses from the calculation. Other mistakes included ignoring dividends or investment gains.
- b) A Large majority of candidates received full credit for this part. The most common error was not describing that the IEE provides information by line of business.
- c) To receive credit for the first part of part c, it was important that the candidate demonstrate they understood not only that rate adequacy is prospective while the IEE is retrospective, but also the reasons why that difference is relevant (growth, change in mix of business, volatility differences by line, simplistic investment allocation methodology, etc.). Unacceptable answers included:
  - IEE is calendar year
  - IEE doesn't include future investment income
  - IEE uses historical reserves

To receive credit for the second part of part c candidates needed to state an alternative measure and describe why it would address the issue discussed in the first part of part c. Acceptable answers needed to have specific suggestions for better measures of future reserves, surplus, or investment income. Unacceptable (due to being non-specific or incomplete) answers included:

- Use pricing actuaries indications
- Use Schedule P ratios
- Use IRIS ratios