16. (3.75 points)

An actuary is given the following expiring policy information for a Workers' Compensation Large Dollar Deductible policy:

Expected Total Loss & ALAE	$500,000
Deductible	$100,000
Percentage of Loss & ALAE Excess of $100,000	40%
Percentage of Loss & ALAE Excess of $200,000	20%
ULAE	5%
Loss Based Assessment Factor	3%
Profit and Variable Expenses	17%
Fixed Expense	$15,000
Aggregate Deductible	$300,000

There are no changes to these expenses and profit provision. The table of Insurance Charges is displayed below:

Modified Table M for Similarly Sized Policies				
	Deductible			
Entry Ratio	$100,000	$200,000	$300,000	$400,000
0.5	.450	.480	.495	.505
1.0	.330	.350	.365	.370
1.5	.270	.303	.325	.350
2.0	.185	.240	.260	.286

The insured would like to retain more risk and requests the price of the following options:

Option 1: Deductible of $200,000 with an aggregate deductible of $400,000.

Option 2: Excess Policy with self-insured retention of $200,000 on a per occurrence basis.

<<QUESTION 16 CONTINUED ON NEXT PAGE>>

a. (2.75 points)

Calculate the difference in price between Option 1 and the expiring structure. Use linear interpolation as needed.

b. (1 point)

The insurer observed an upward trend of ground up losses in the insured's industry for the most recent year, but is unsure if this trend will continue in the future. Based on this observation, recommend one of the two options for the insurer and fully support the recommendation.

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QUESTION: 16	
TOTAL POINT VALUE: 3.75	**LEARNING OBJECTIVE(S): B6,B7**

SAMPLE ANSWERS

Part a: 2.75 points

Sample 1

Want to know difference in price between Option 1 and expiring.

$$\text{Price of Expiring} = \frac{(\text{XS Loss} + \phi(r) \times \text{EPL}) + \text{EL} \times (\text{ULAE} + \text{LBA}) + \text{FE}}{1 - \text{PVE}}$$

FE = 15,000
PVE = 0.17
EL = 500,000
XS loss = 500,000 x 0.4 = 200,000
ULAE = 5%
LBA = 3%
EPL = 500,000 – 200,000 = 300,000
r = 300,000 / 300,000 = 1
$\phi(r) = 0.33$

$$\text{Price} = \frac{(200{,}000 + 0.33 \times 300{,}000) + 500{,}000 \times (0.05 + 0.03) + 15{,}000}{1 - 0.17} = 426{,}506$$

Option 1:

XS Loss = 500,000 x 0.2 = 100,000
EPL = 500,000 – 100,000 = 400,000
r = 400,000 / 400,000 = 1
$\phi(r) = 0.35$

$$\text{Price} = \frac{(100{,}000 + 0.35 \times 400{,}000) + 500{,}000 \times (0.08) + 15{,}000}{1 - 0.17} = 355{,}422$$

355,422 – 426,506 = -71,084

Option 1 is $71,084 cheaper than expiring.

Sample 2

Expiring: [500 x (0.4 + 0.6 x 0.33) + 500 x (0.05 + 0.03) + 15] / (1 – 0.17) = 426.5

Option 1: [500 x (0.2 + 0.8 x 0.35) + 500 x (0.05 + 0.03) + 15] / (1 – 0.17) = 355.4

Δ = 71.1 K

Part b: 1 point

- I recommend Option 2. Option 2 does not list an aggregate retention limit and so will be more protected against losses increasing above this (in aggregate). Also, not having adjusting expenses on losses below the limit will also reduce costs. This will also protect the insurer

against possible credit risk if the insured is unable to pay the unexpectedly higher losses and so can't reimburse insurer.

- Go with Option 1. You can still handle all claims, and try to keep the costs down. (Insured may not have as much incentive to keep claims from piercing above 200K). Excess workers compensation has longer average payout so more uncertain. The shorter payout for option 1 will help offset risks from trend.
- Excess Policy: Insurer can save on costs by not having to adjust claims. Also, if insured moved their deductible up, the credit risk increases for insurer → would need more collateral. This is contingent on market recognizing trend and not pursuing profit margins too low to where insurer can't make money. Since longer payout period for an excess policy (compared to LDD) should be able to make up lower profit margin through longer tailed investments (and higher return). If trend doesn't hold up but market has adjusted for it, then should make higher than expected profit. If trend turns out to be related to frequency, then better off not accumulating these attritional losses → higher risk of hitting agg if frequency increasing XS policy wouldn't have to provide additional coverage for 1st dollar claims.
- I would recommend Option 1 – The LDD policy. An upward trend in ground up losses would be amplified for excess losses for two reasons:
    i. For losses that are already above the retention, trend will apply completely in the excess layer.
    ii. For losses just below the retention, trend will push then above the retention, creating new excess losses.

  This means that the loss portion of the both the LDD and the excess policies is at risk of being much higher than expected. The loss portion is a much smaller percent of LDD premium as it is of excess premium, since LDD policies have more expenses. This means that the excess policy premium is at greater risk of being inadequate since there are fewer expenses to smooth it out. Also, under LDD policies, the insurer handles all claims, so it has more control over the ultimate loss amount. Excess policies may have uncertain ultimate excess losses because they are partially dependent on the TPA handling the claim below the retention.

EXAMINER'S REPORT

Candidates were expected to be able to calculate the premium for large dollar deductible (LDD) policies based on the parameters given in the question. In addition, candidates were expected to know advantages of LDD and excess policies.

Part a

Candidates were expected to fully calculate the prices for the expiring and Option 1 policies, based on the parameters given, and state the difference in price between the two policies.

Common mistakes include:

- Calculating the price for Option 2 (excess policy) instead of the expiring policy and calculating the difference between Option 1 and Option 2. These answers still received a majority of partial credit, as Option 1 being calculated correctly showed that the candidate understood the formula and how to use the parameters.
- Calculating incorrect entry ratios or looking up incorrect insurance changes from Modified Table M. Both of these were often due to using the aggregate deductible incorrectly to calculate the entry ratio or look up the insurance charge.
- Calculating incorrect excess and primary losses for either policy.
- Forgetting to multiply the insurance charge by expected **primary** losses and instead

multiplying by expected total losses.

- Incorrectly applying the expense parameters of the formula. Examples included forgetting to include $15K in fixed expenses, multiplying losses by one plus LBA and ULAE, or forgetting to include LBA or ULAE in the formula.
- Forgetting to calculate the difference between the two prices.

Part b

Candidates were expected to provide 2 advantages of the option which they selected (either Option 1 or Option 2) and provide full reasoning for each advantage. Alternatively, candidates could have provided an advantage of the option which they selected and a disadvantage of the option which they didn't select.

Common mistakes include:

- Citing advantages and disadvantages of a given option, but not connecting these to the situation presented (increasing ground up loss trend).
- Stating that the aggregate deductible provided a cap on losses to the insurer, rather than to the insured.
- Answering the question from the perspective of the insured, rather than the insurer.