Reading: Fisher.TableL

Fisher_ICRLLEx (Problem 1)

Model: Source Text

Problem Type: Apply the ICRLL method to determine the total policy loss cost.

Given Consider a workers' compensation policy which has the following characteristics:

$250,000	Per-occurrence limit
$750,000	Aggregate limit
$650,000	Expected unlimited aggregate loss
$490,000	Expected limited aggregate loss

The state/hazard group adjustment factor is 0.9

You may use the information in the following tables

Expected Loss Group	Range of Values
31	630,000 - 720,000
30	720,001 - 830,000
29	830,001 - 990,000
28	990,001 - 1,180,000
27	1,180,001 - 1,415,000
26	1,415,001 - 1,744,000

Table M	Expected Loss Group					
Entry Ratio	31	30	29	28	27	26
0.75	0.4150	0.4069	0.3989	0.3911	0.3833	0.3755
0.81	0.3864	0.3777	0.3690	0.3605	0.3521	0.3436
1.07	0.2867	0.2764	0.2661	0.2557	0.2453	0.2349
1.15	0.2628	0.2522	0.2417	0.2310	0.2203	0.2096
1.53	0.1797	0.1690	0.1583	0.1476	0.1369	0.1261

Find Using the ICRLL method, calculate the total loss cost for the workers' compensation policy.

Solution

Since the ICRLL method is used to transform a Limited Table M into a Table M, we need to work with entry ratios from the Limted Table M at first.

1.) Compute the **Limited Table M** entry ratio $r = \frac{\text{Actual Limited Aggregate Loss}}{\text{Expected Limited Aggregate Loss}}$

Since the actual limited aggregate loss is (currently) unknown for the policy (we're pricing future losses), we substitute the aggregate policy limit for the actual limited aggregate loss.
This gives r = $750,000 / $490,000 = 1.53

2.) Compute the excess ratio $k = \frac{E - E[A_D]}{E}$

This gives k = (650,000 - 490,000) / 650,000 = 0.2462

3.) Compute the ICRLL adjustment $ICRLL = \frac{1 + 0.8k}{1 - k}$

This gives ICRLL = (1 + 0.8 * 0.2462) / (1 - 0.2462) = 1.5879

4.) Compute the adjusted expected loss = E * (State/hazard group adjustment) * ICRLL
This gives adjusted expected loss = $650,000 * 0.9 * 1.5879 = $928,921.50

5.) Find the expected loss group (ELG) that contains the adjusted expected loss.
This is ELG 29

6.) Look up ELG 29 and entry ratio 1.53 in the given Table M to get the insurance charge.
The insurance charge is 0.1583

7.) Calculate the aggregate limit charge, $\phi(r) \cdot E[A_D]$
This yields an aggregate limit charge of 0.1583 * $490,000 = $77,567

8.) Calculate the per-occurrence limit charge, $E - E[A_D]$
This yields a per-occurrence limit charge of $160,000

9.) Calculate the total loss cost of the policy = sum the per-occurrence and aggregate limit charges.
The total loss cost is $237,567