Reading: Fisher.TableL
Model: Source Text
Problem Type: Construct a Table L from empirical data

Given Experience for a group of risks with a per-occurrence limit of $50,000

	Actual	
Risk	Unlimited Aggregate Loss	Limited Aggregate Loss
1	20,000	20,000
2	50,000	50,000
3	60,000	60,000
4	70,000	70,000
5	80,000	80,000
6	80,000	80,000
7	90,000	90,000
8	100,000	100,000
9	150,000	120,000
10	300,000	250,000
Average	100,000	92,000

Find Construct a Table L using the above data.

Solution

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

Since we're not told the expected limited (or unlimited) aggregate losses, we approximate them with the average values from the table.
So the excess ratio is k = ($100,000 - $92,000) / $100,000 = 0.08

2.) Compute the entry ratio for each risk. Again, since the expected unlimited aggregate losses are unknown, use the average of all risks.

Remember: The Table L entry ratio is defined as $r = \frac{\text{Actual Limited Aggregate Loss}}{\text{Expected Unlimited Aggregate Loss}}$

Risk	Actual Unlimited Aggregate Loss	Actual Limited Aggregate Loss	Entry Ratio, r
1	20,000	20,000	0.20
2	50,000	50,000	0.50
3	60,000	60,000	0.60
4	70,000	70,000	0.70
5	80,000	80,000	0.80
6	80,000	80,000	0.80
7	90,000	90,000	0.90
8	100,000	100,000	1.00
9	150,000	120,000	1.20
10	300,000	250,000	2.50

3.) Apply the horizontal slicing method, making sure to arrange the unique entry ratios in **ascending** order and include a row for the 0 entry ratio.

Unique Entry Ratios	# Risks	# Risks over r	% Risks over r	Difference in r	$\phi_D^*(r) - k$	$\phi_D^*(r)$
0.00	0	10	100%	0.20	0.92	1.00
0.20	1	9	90%	0.30	0.72	0.80
0.50	1	8	80%	0.10	0.45	0.53
0.60	1	7	70%	0.10	0.37	0.45
0.70	1	6	60%	0.10	0.30	0.38
0.80	2	4	40%	0.10	0.24	0.32
0.90	1	3	30%	0.10	0.20	0.28
1.00	1	2	20%	0.20	0.17	0.25
1.20	1	1	10%	1.30	0.13	0.21
2.50	1	0	0%	0.00	0.00	0.08

The difference in r entry is the entry ratio in row k+1 minus the entry ratio in row k, where k is the current row. It is always 0 for the last row.
$\phi_D^*(r) - k$ is calculated as (% Risks over r) * (Difference in r) for row k, plus the entry for row k+1, column $\phi_D^*(r) - k$

4.) Complete the Table L by using the formula $\psi_D^*(r) = \phi_D^*(r) + r - 1$

Entry Ratio r	$\phi_D^*(r)$	$\psi_D^*(r)$
0.00	1.00	0.00
0.20	0.80	0.00
0.50	0.53	0.03
0.60	0.45	0.05
0.70	0.38	0.08
0.80	0.32	0.12
0.90	0.28	0.18
1.00	0.25	0.25
1.20	0.21	0.41
2.50	0.08	1.58