

Reading: Fisher.ExperienceRating
Model: 2018.Q9
Problem Type: Apply the quintiles test

Fisher_QuintilesTest (Problem 1)

Given	Risk #	Manual Premium	Loss	Mod	Standard Premium
	1	810	750	0.97	786
	2	900	490	0.68	612
	3	950	1,075	1.13	1,074
	4	975	650	0.78	761
	5	1,075	850	0.88	946
	6	1,100	1,000	0.96	1,056
	7	1,225	1,300	1.06	1,299
	8	1,300	800	0.72	936
	9	1,450	1,175	0.90	1,305
	10	1,500	975	0.76	1,140

Find Apply the quintiles test

Solution

First rank the risks from smallest to largest experience modification

Rank	Risk #	Manual Premium	Loss	Mod	Standard Premium
1	2	900	490	0.68	612
2	8	1300	800	0.72	936
3	10	1500	975	0.76	1140
4	4	975	650	0.78	761
5	5	1075	850	0.88	946
6	9	1450	1175	0.90	1305
7	6	1100	1000	0.96	1056
8	1	810	750	0.97	786
9	7	1225	1300	1.06	1299
10	3	950	1075	1.13	1074

Next, collapse into five groups. Here it is natural to group into consecutive pairs - on the exam make sure to state your logic when grouping.

Risk #s	Quintile	Manual Premium (1)	Loss (2)	Manual LR (3)	Average Mod (4)	Standard Premium (5)	Standard LR (6)
2, 8	1	2200	1290	58.6%	0.70	1548	83.3%
10, 4	2	2475	1625	65.7%	0.77	1901	85.5%
5, 9	3	2525	2025	80.2%	0.89	2251	90.0%
6, 1	4	1910	1750	91.6%	0.96	1842	95.0%
7, 3	5	2175	2375	109.2%	1.09	2373	100.1%

(1), (2), (5) Sum over risks in quintile

(3) = (2) / (1)

(4) = Sumproduct of the experience mod and manual premium within quintile, divided by the sum of the manual premium in the quintile.

(6) = (2) / [(4) * (1)]

Notes:

1.) Since Standard Premium = Experience * Manual Premium for any given risk, it wasn't necessary to calculate the average experience modification factor for each quintile.

2.) We get the same result if we calculate (6) = (2) / (5).