Reading: Friedland 11 (Frequency-Severity Methods)
Model: 2017.Fall #20
Problem Type: Reserving Methods - FS (Exposures & Trends 020)

Find Calculate the ultimate for AY 2025 using a frequency-severity method.

** Note the actual exam problem asks for the BF ultimate where the result of the frequency-severity method is used as the 'a-priori' initial estimate in the BF formula*

Given

AY	payroll (000s)	rptd loss (000s)	indicated ultimate counts	selected severity
2022	68,000	3,470	1,090	3,400
2023	71,500	2,151	1,000	3,600
2024	75,200	1,377	1,130	?
2025	79,000	1,033	?	?

annual trend for exposures (payroll inflation rate)	5%
annual trend for counts	1%
annual trend for severity	7%

Step 1 calculate frequency **trended to 2025**: *(trended counts) / (trended exposures)*

AY	counts	count trd fctr	payroll	payroll trd fctr	trended frequency
2022	1,090	1.01^3	68,000	1.05^3	1.427%
2023	1,000	1.01^2	71,500	1.05^2	1.294%
2024	1,130	1.01^1	75,200	1.05^1	1.445%
2025					**1.436%**

Unless there is an obvious outlier, you are usually safe selectng the average because there are only 3 data points.

<-- average excluding AY 2023

Step 2 calculate severity **trended to 2025**: *apply severity trend to given selected severities*

AY	selected severity	severity trd fctr	trended severity
2022	3,400	1.07^3	4,165
2023	3,600	1.07^2	4,122
2024	n/a	n/a	n/a
2025			4,143

With only 2 data points, you really have no choice but to select the average

<-- default selection = all period average

Step 3 calculate the ultimate for **AY 2025** (in 000s)

ultimate	=	exposure	x	frequency	x	severity	/	1,000
	=	79,000	x	1.436%	x	4,143	/	1,000
	=	4,701	*<-- final answer*					

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Find Calculate the ultimate for AY 2025 using a frequency-severity method.

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Given

AY	payroll (000s)	rptd loss (000s)	indicated ultimate counts	selected severity
2022	24,000	1,320	340	1,400
2023	24,700	937	420	1,100
2024	25,500	562	410	?
2025	26,200	343	?	?

annual trend for exposures (payroll inflation rate)	3%
annual trend for counts	1%
annual trend for severity	10%

Step 1 calculate frequency **trended to 2025**: *(trended counts) / (trended exposures)*

AY	counts	count trd fctr	payroll	payroll trd fctr	trended frequency
2022	340	1.01^3	24,000	1.03^3	1.336%
2023	420	1.01^2	24,700	1.03^2	1.635%
2024	410	1.01^1	25,500	1.03^1	1.577%
2025					**1.606%**

Unless there is an obvious outlier, you are usually safe selectng the average because there are only 3 data points.

<-- average excluding AY 2022

Step 2 calculate severity **trended to 2025**: *apply severity trend to given selected severities*

AY	selected severity	severity trd fctr	trended severity
2022	1,400	1.1^3	1,863
2023	1,100	1.1^2	1,331
2024	n/a	n/a	n/a
2025			1,597

With only 2 data points, you really have no choice but to select the average

<-- default selection = all period average

Step 3 calculate the ultimate for **AY 2025** (in 000s)

ultimate	=	exposure	x	frequency	x	severity	/	1,000
	=	26,200	x	1.606%	x	1,597	/	1,000
	=	672	*<-- final answer*					