

Reading: Friedland 10 (Frequency-Severity Methods)
Model: 2019.Fall #20
Problem Type: Reserving Methods - FS (Disposal Rate Method)

F-11 (030) 2019.Fall Q20 (Problem)

Find Use the frequency-severity disposal rate method to estimate **unpaid** claims for AY 2025

Given A court ruling on Dec 31, 2025 will increase future claims payments by **20%**
 All claims are closed by 48 months
 Severity trend: **0%**

AY	<u>Cumulative</u> Paid Counts (CPC)				Ultimate Counts
	12	24	36	48	
2022	308	555	642	647	647
2023	356	563	678		683
2024	358	575			684
2025	402				795

AY	<u>Cumulative</u> Paid Loss (\$000s) (CPL)			
	12	24	36	48
2022	375	745	906	916
2023	397	750	922	
2024	422	762		
2025	385			

Step 1a calculate CPC and IPC

(you will be given 1 of them and have to calculate the other)

F-11 (030) 2019.Fall Q20 (Solution)

given	Cumulative Paid Counts (CPC)			
AY	12	24	36	48
2022	308	555	642	647
2023	356	563	678	
2024	358	575		
2025	402			

	Incremental Paid Counts (IPC)			
AY	12	24	36	48
2022	308	247	87	5
2023	356	207	115	
2024	358	217		
2025	402			

Step 1b calculate CPL and IPL

(you will be given 1 of them and have to calculate the other)

given	Cumulative Paid Loss (\$000s) (CPL)			
AY	12	24	36	48
2022	375	745	906	916
2023	397	750	922	
2024	422	762		
2025	385			

	Incremental Paid Loss (\$000s) (IPL)			
AY	12	24	36	48
2022	375	370	161	10
2023	397	353	172	
2024	422	340		
2025	385			

Step 2a calculate CDR as: CPC / UC (UC = Ultimate Counts)

	Claims Disposal Rate (CDR)			
AY	12	24	36	48
2022	0.476	0.858	0.992	1.000
2023	0.521	0.824	0.993	
2024	0.523	0.841		
2025	0.506			
select	0.507	0.841	0.993	1.000

<-- default selection = all period average

Step 2b project IPC

(project the Incremental Paid Counts to the lower right portion of the IPC triangle)

	Incremental Paid Counts (IPC)			
AY	12	24	36	48
2022				5
2023				
2024			104	5
2025		266	121	6

This is the part of the calculation where it's easy to make a mistake.

You have to distribute the remaining counts proportionately using the disposal rate you selected in the previous step.

			remaining counts			proportional distribution		
2025/24:	266	=	(795 - 402)	x	(0.841 - 0.507)	/	(1 - 0.507)	
2025/36:	121	=	(795 - 402)	x	(0.993 - 0.841)	/	(1 - 0.507)	
2025/48:	6	=	(795 - 402)	x	(1 - 0.993)	/	(1 - 0.507)	
* 2024/36:	104	=	(684 - 575)	x	(0.993 - 0.841)	/	(1 - 0.841)	
* 2024/48:	5	=	(684 - 575)	x	(1 - 0.993)	/	(1 - 0.841)	
* 2023/48:	5	=	(683 - 678)	x	(1 - 0.993)	/	(1 - 0.993)	

* Note that don't have to project every AY. You only have to project the rows for AYs you're asked to calculate.

Step 3a calculate IPS trended to AY 2025, and select an AY 2025 severity for the unpaid periods 24, 36, 48

	Incremental Paid Severity (IPS)			
AY	12	24	36	48
2022		1.498	1.851	2.000
2023		1.705	1.496	
2024		1.567		
2025		1.590	1.673	2.000

demonstration of severity calc & trending for age 24

1.498	=	(370 / 247) x (1 + 0%)^3
1.705	=	(353 / 207) x (1 + 0%)^2
1.567	=	(340 / 217) x (1 + 0%)^1

<-- default selected severity = all period average

counts 266 121 6 <-- from Step 2b

Step 3b unpaid <-- (selected severity) x counts

court ruling adj. 20% 20% 20% <-- adjust unpaid by this percentage

adj. unpaid	507.528	242.920	14.400	764.848	<-- final answer for UNPAID loss
				1,149.848	<-- ULTIMATE loss