

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

F-11 (030) FS (Problem 1)

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

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

AY	<u>Cumulative</u> Paid Counts (CPC)				Ultimate Counts
	12	24	36	48	
2022	200	465	753	788	788
2023	218	635	1,246		1,304
2024	240	725			1,359
2025	266				1,372

AY	<u>Cumulative</u> Paid Loss (\$000s) (CPL)			
	12	24	36	48
2022	720	1,884	2,721	3,203
2023	706	1,593	1,935	
2024	706	1,711		
2025	734			

Step 1a calculate CPC and IPC

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

F-11 (030) FS (Solution 1)

given	Cumulative Paid Counts (CPC)			
AY	12	24	36	48
2022	200	465	753	788
2023	218	635	1,246	
2024	240	725		
2025	266			

	Incremental Paid Counts (IPC)			
AY	12	24	36	48
2022	200	265	288	35
2023	218	417	611	
2024	240	485		
2025	266			

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	720	1,884	2,721	3,203
2023	706	1,593	1,935	
2024	706	1,711		
2025	734			

	Incremental Paid Loss (\$000s) (IPL)			
AY	12	24	36	48
2022	720	1,164	837	482
2023	706	887	342	
2024	706	1,005		
2025	734			

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

	Claims Disposal Rate (CDR)			
AY	12	24	36	48
2022	0.254	0.590	0.956	1.000
2023	0.167	0.487	0.956	
2024	0.177	0.533		
2025	0.194			
select	0.198	0.537	0.956	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				
2023				58
2024			574	60
2025		467	578	61

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:	467	=	(1372 - 266)	x	(0.537 - 0.198)	/	(1 - 0.198)	
2025/36:	578	=	(1372 - 266)	x	(0.956 - 0.537)	/	(1 - 0.198)	
2025/48:	61	=	(1372 - 266)	x	(1 - 0.956)	/	(1 - 0.198)	
* 2024/36:	574	=	(1359 - 725)	x	(0.956 - 0.537)	/	(1 - 0.537)	
* 2024/48:	60	=	(1359 - 725)	x	(1 - 0.956)	/	(1 - 0.537)	
* 2023/48:	58	=	(1304 - 1246)	x	(1 - 0.956)	/	(1 - 0.956)	

* 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		4.392	2.906	13.771
2023		2.127	0.560	
2024		2.072		
2025		2.864	1.733	13.771

demonstration of severity calc & trending for age 24

4.392	=	(1164 / 265) x (1 + 0%)^3
2.127	=	(887 / 417) x (1 + 0%)^2
2.072	=	(1005 / 485) x (1 + 0%)^1

<-- default selected severity = all period average

counts 467 578 61 <-- from Step 2b

Step 3b unpaid (selected severity) x counts

court ruling adj. 0% 0% 0% <-- adjust unpaid by this percentage

adj. unpaid 1,337 1,002 840 <-- final answer for UNPAID loss

3,913 <-- ULTIMATE loss

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

F-11 (030) FS (Problem 2)

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

Given A court ruling on Dec 31, 2025 will increase future claims payments by **10%**
 All claims are closed by 48 months
 Severity trend: **-12%**

AY	<u>Cumulative</u> Paid Counts (CPC)				Ultimate Counts
	12	24	36	48	
2022	120	291	424	471	471
2023	133	300	409		454
2024	141	388			608
2025	158				613

AY	<u>Cumulative</u> Paid Loss (\$000s) (CPL)			
	12	24	36	48
2022	500	1,560	2,253	2,332
2023	485	1,477	2,181	
2024	509	1,351		
2025	519			

given	Cumulative Paid Counts (CPC)			
AY	12	24	36	48
2022	120	291	424	471
2023	133	300	409	
2024	141	388		
2025	158			

	Incremental Paid Counts (IPC)			
AY	12	24	36	48
2022	120	171	133	47
2023	133	167	109	
2024	141	247		
2025	158			

given	Cumulative Paid Loss (\$000s) (CPL)			
AY	12	24	36	48
2022	500	1,560	2,253	2,332
2023	485	1,477	2,181	
2024	509	1,351		
2025	519			

	Incremental Paid Loss (\$000s) (IPL)			
AY	12	24	36	48
2022	500	1,060	693	79
2023	485	992	704	
2024	509	842		
2025	519			

	Claims Disposal Rate (CDR)			
AY	12	24	36	48
2022	0.255	0.618	0.900	1.000
2023	0.293	0.661	0.901	
2024	0.232	0.638		
2025	0.258			
select	0.260	0.639	0.901	1.000

<-- default selection = all period average

	Incremental Paid Counts (IPC)			
AY	12	24	36	48
2022				
2023				45
2024			160	60
2025		233	161	61

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:	233	=	(613 - 158)	x	(0.639 - 0.26)	/	(1 - 0.26)
2025/36:	161	=	(613 - 158)	x	(0.901 - 0.639)	/	(1 - 0.26)
2025/48:	61	=	(613 - 158)	x	(1 - 0.901)	/	(1 - 0.26)
* 2024/36:	160	=	(608 - 388)	x	(0.901 - 0.639)	/	(1 - 0.639)
* 2024/48:	60	=	(608 - 388)	x	(1 - 0.901)	/	(1 - 0.639)
* 2023/48:	45	=	(454 - 409)	x	(1 - 0.901)	/	(1 - 0.901)

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

	Incremental Paid Severity (IPS)			
AY	12	24	36	48
2022		4.224	3.551	1.145
2023		4.600	5.002	
2024		3.000		
2025		3.941	4.276	1.145

demonstration of severity calc & trending for age 24

$$4.224 = (1060 / 171) \times (1 + -12\%)^3$$

$$4.600 = (992 / 167) \times (1 + -12\%)^2$$

$$3.000 = (842 / 247) \times (1 + -12\%)^1$$

<-- default selected severity = all period average

counts 233 161 61 <-- from Step 2b

court ruling adj. 10% 10% 10% <-- adjust unpaid by this percentage

adj. unpaid 1,010 757 77 1,844 <-- final answer for UNPAID loss

2,363 <-- ULTIMATE loss