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

Find Use the frequency-severity disposal rate method to estimate unpaid claims for AY 2025
Data Set: Book Triangles Scenario 0: stable data

Given A court ruling on Dec 31, 2025 will increase future claims payments by 10%
All claims are closed by 48 months
Severity trend: 0%

	Cumulative Paid Counts **(CPC)**				Ultimate
AY	12	24	36	48	Counts
2022	2	5	8	10	12
2023	2	5	8		12
2024	2	5			12
2025	2				12

	Cumulative Paid Loss ($000s) **(CPL)**			
AY	12	24	36	48
2022	720	1,800	2,880	3,600
2023	720	1,800	2,880	
2024	720	1,800		
2025	720			

Step 1a calculate CPC and IPC *(you will be given 1 of them and have to calculate the other)*

given	Cumulative Paid Counts **(CPC)**			
AY	12	24	36	48
2022	2	5	8	10
2023	2	5	8	
2024	2	5		
2025	2			

	Incremental Paid Counts **(IPC)**			
AY	12	24	36	48
2022	2	3	3	2
2023	2	3	3	
2024	2	3		
2025	2			

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	1,800	2,880	3,600
2023	720	1,800	2,880	
2024	720	1,800		
2025	720			

	Incremental Paid Loss ($000s) **(IPL)**			
AY	12	24	36	48
2022	720	1,080	1,080	720
2023	720	1,080	1,080	
2024	720	1,080		
2025	720			

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

	Claims DIsposal Rate **(CDR)**			
AY	12	24	36	48
2022	0.167	0.417	0.667	0.833
2023	0.167	0.417	0.667	
2024	0.167	0.417		
2025	0.167			
select	**0.167**	**0.417**	**0.667**	**1.000**

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				4
2024			3	4
2025		3	3	4

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:	3	=	(12 - 2)	x	(0.417 - 0.167)	/	(1 - 0.167)
2025/36:	3	=	(12 - 2)	x	(0.667 - 0.417)	/	(1 - 0.167)
2025/48:	4	=	(12 - 2)	x	(1 - 0.667)	/	(1 - 0.167)
* 2024/36:	3	=	(12 - 5)	x	(0.667 - 0.417)	/	(1 - 0.417)
* 2024/48:	4	=	(12 - 5)	x	(1 - 0.667)	/	(1 - 0.417)
* 2023/48:	4	=	(12 - 8)	x	(1 - 0.667)	/	(1 - 0.667)

* *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	360	360	360	360		
2023	360	360	360			
2024	360	360				
2025	**360**	**360**	**360**	**360**	*<-- default selected severity = all period average (except age 12)*	
counts		3	3	4	*<-- from Step 2b*	
Step 3b unpaid		1,080	1,080	1,440	*<-- (selected severity) x counts*	
court ruling adj.		10%	10%	10%	*<-- adjust unpaid by this percentage*	
adj. unpaid		1,188	1,188	1,584	3,960	*<-- final answer for UNPAID loss*
					4,680	*<-- ULTIMATE loss*

demonstration of severity calc & trending for age 24

360	=	(1080 / 3) x (1 + 0%)^3
360	=	(1080 / 3) x (1 + 0%)^2
360	=	(1080 / 3) x (1 + 0%)^1

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

Find Use the frequency-severity disposal rate method to estimate unpaid claims for AY 2025
Data Set: Book of Triangles Scenario 6: deteriortating loss ratio AY 2022 to AY 2025

Given A court ruling on Dec 31, 2025 will increase future claims payments by 0%
All claims are closed by 60 months
Severity trend: 5%

	Cumulative Paid Counts **(CPC)**				Ultimate
AY	12	24	36	48	Counts
2022	2	5	8	10	12
2023	2	5	8		12
2024	2	5			12
2025	2				12

	Cumulative Paid Loss ($000s) **(CPL)**			
AY	12	24	36	48
2022	768	1,920	3,072	3,840
2023	792	1,980	3,168	
2024	816	2,040		
2025	840			

Step 1a calculate CPC and IPC *(you will be given 1 of them and have to calculate the other)*

given	Cumulative Paid Counts **(CPC)**			
AY	12	24	36	48
2022	2	5	8	10
2023	2	5	8	
2024	2	5		
2025	2			

	Incremental Paid Counts **(IPC)**			
AY	12	24	36	48
2022	2	3	3	2
2023	2	3	3	
2024	2	3		
2025	2			

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	768	1,920	3,072	3,840
2023	792	1,980	3,168	
2024	816	2,040		
2025	840			

	Incremental Paid Loss ($000s) **(IPL)**			
AY	12	24	36	48
2022	768	1,152	1,152	768
2023	792	1,188	1,188	
2024	816	1,224		
2025	840			

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

	Claims DIsposal Rate **(CDR)**			
AY	12	24	36	48
2022	0.167	0.417	0.667	0.833
2023	0.167	0.417	0.667	
2024	0.167	0.417		
2025	0.167			
select	**0.167**	**0.417**	**0.667**	**0.833**

<-- 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				4
2024			4	3
2025		4	4	2

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:	4	=	(12 - 2)	x	(0.417 - 0.167)	/	(0.833 - 0.167)
2025/36:	4	=	(12 - 2)	x	(0.667 - 0.417)	/	(0.833 - 0.167)
2025/48:	2	=	(12 - 2)	x	(0.833 - 0.667)	/	(0.833 - 0.167)
* 2024/36:	4	=	(12 - 5)	x	(0.667 - 0.417)	/	(0.833 - 0.417)
* 2024/48:	3	=	(12 - 5)	x	(0.833 - 0.667)	/	(0.833 - 0.417)
* 2023/48:	4	=	(12 - 8)	x	(0.833 - 0.667)	/	(0.833 - 0.667)

* *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	445	445	445	445
2023	437	437	437	
2024	428	428		
2025	**420**	**437**	**441**	**445**
counts		4	4	2
Step 3b unpaid		1,746	1,762	889
court ruling adj.		0%	0%	0%
adj. unpaid		1,746	1,762	889

<-- default selected severity = all period average (except age 12)

<-- from Step 2b

<-- (selected severity) x counts

<-- adjust unpaid by this percentage

demonstration of severity calc & trending for age 24		
445	=	(1152 / 3) x (1 + 5%)^3
437	=	(1188 / 3) x (1 + 5%)^2
428	=	(1224 / 3) x (1 + 5%)^1

4,397 *<-- final answer for UNPAID loss*

5,237 *<-- ULTIMATE loss*

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

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%

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

	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			

Step 1a calculate CPC and IPC *(you will be given 1 of them and have to calculate the other)*

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**
counts		467	578	61
Step 3b unpaid		1,337	1,002	840
court ruling adj.		0%	0%	0%
adj. unpaid		1,337	1,002	840

<-- default selected severity = all period average

<-- from Step 2b

<-- (selected severity) x counts

<-- adjust unpaid by this percentage

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

3,179 *<-- 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)

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%

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

	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			

Step 1a calculate CPC and IPC *(you will be given 1 of them and have to calculate the other)*

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			

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	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			

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

	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

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				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.*

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		4.224	3.551	1.145	
2023		4.600	5.002		
2024		3.000			
2025		**3.941**	**4.276**	**1.145**	*<-- default selected severity = all period average*
counts		233	161	61	*<-- from Step 2b*
Step 3b unpaid		918	688	70	*<-- (selected severity) x counts*
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*

demonstration of severity calc & trending for age 24		
4.224	=	(1060 / 171) x (1 + -12%)^3
4.600	=	(992 / 167) x (1 + -12%)^2
3.000	=	(842 / 247) x (1 + -12%)^1