Reading: Friedland 16 (ALAE) (Fr16.ALAE) 03a-Question
Model: 2019.Spring #24
Problem Type: Additive or Multiplicative approach for ALAE

Problem Use the multiplicative approach to estimate the ultimate ALAE for AY 2019

cumulative paid claims:

AY	12	24	36	48
2016	4,400	12,700	19,800	22,000
2017	5,000	14,600	20,800	
2018	3,600	10,900		
2019	4,000			

cumulative paid ALAE:

AY	12	24	36	48
2016	123	506	818	882
2017	100	391	657	
2018	104	467		
2019	120			

selected ultimate claims by AY

AY	ult clms
2016	22,000
2017	22,428
2018	17,023
2019	19,128

<=== *sometimes you are not given the ultimate claims*
- you would then have to calculate them using an appropriate method
- see 2016.Spring #23

When selecting development factors, you may select a SIMPLE AVERAGE in this problem.

Step 1: Ratio of cumulative paid ALAE to cumulative paid claims:

AY	12	24	36	48
2016	2.80%	3.98%	4.13%	4.01%
2017	2.00%	2.68%	3.16%	
2018	2.89%	4.28%		
2019	3.00%			

Step 2: Development triangle (either additive or multiplicative as appropriate):

AY	12-24	24-36	36-48	48-		
2016	1.4214	1.0377	0.9709		<===	MULTIPLICATIVE development
2017	1.3400	1.1791				
2018	1.4810					
2019						
selected	1.4141	1.1084	0.9709	1.0000	<===	tail = 0.0 if additive OR 1.0 if multiplicative
cum	1.5217	1.0761	0.9709	1.0000	<===	MULTIPLICATIVE: selected x (previous cum)
Ult Ratio	4.57%	4.61%	3.07%	4.01%	<===	MULTIPLICATIVE: cum x (latest diagonal from Step 1)

AY	2019	2018	2017	2016	<===	given information
ult clms	19,128	17,023	22,428	22,000		*(provided here for convenience)*
pd ALAE	120	467	657	882		

Step 3: Ultimate ALAE = (Ultimate Ratio) x (Ultimate Claims)
Unpad ALAE = (Ultimate ALAE) - (Paid ALAE)

AY	Ult ALAE	UnPd ALAE
2016	882.2	0.2
2017	688.5	31.5
2018	784.8	317.8
2019	874.1	754.1
	3,229.6	1,103.6

Step 4: ultimate ALAE for AY 2019 = 874.1 <=== final answer

Reading: Friedland 16 (ALAE) (Fr16.ALAE) 04a-Question
Model: 2019.Spring #24
Problem Type: Additive or Multiplicative approach for ALAE

Problem Use the multiplicative approach to estimate the unpaid ALAE for AY 2020

cumulative paid claims:

AY	12	24	36	48
2018	3,500	9,600	14,700	16,300
2019	3,400	9,600	14,800	
2020	3,800	11,200		
2021	3,800			

cumulative paid ALAE:

AY	12	24	36	48
2018	91	397	603	657
2019	71	322	526	
2020	103	463		
2021	114			

selected ultimate claims by AY

AY	ult clms
2018	16,300
2019	16,650
2020	18,860
2021	17,825

<=== *sometimes you are not given the ultimate claims*
- you would then have to calculate them using an appropriate method
- see 2016.Spring #23

When selecting development factors, you may select a SIMPLE AVERAGE in this problem.

Step 1: Ratio of cumulative paid ALAE to cumulative paid claims:

AY	12	24	36	48
2018	2.60%	4.14%	4.10%	4.03%
2019	2.09%	3.35%	3.55%	
2020	2.71%	4.13%		
2021	3.00%			

Step 2: Development triangle (either additive or multiplicative as appropriate):

AY	12-24	24-36	36-48	48-		
2018	1.5923	0.9903	0.9829		<===	MULTIPLICATIVE development
2019	1.6029	1.0597				
2020	1.5240					
2021						
selected	1.5731	1.0250	0.9829	1.0000	<===	tail = 0.0 if additive OR 1.0 if multiplicative
cum	1.5849	1.0075	0.9829	1.0000	<===	MULTIPLICATIVE: selected x (previous cum)
Ult Ratio	4.75%	4.16%	3.49%	4.03%	<===	MULTIPLICATIVE: cum x (latest diagonal from Step 1)

AY	2021	2020	2019	2018	<===	given information
ult clms	17,825	18,860	16,650	16,300		*(provided here for convenience)*
pd ALAE	114	463	526	657		

Step 3:

Ultimate ALAE = (Ultimate Ratio) x (Ultimate Claims)

Unpad ALAE = (Ultimate ALAE) - (Paid ALAE)

AY	Ult ALAE	UnPd ALAE
2018	656.9	(0.1)
2019	581.1	55.1
2020	784.6	321.6
2021	846.7	732.7
	2,869.2	1,109.2

Step 4: unpaid ALAE for AY 2020 = 321.6 <=== final answer

Reading: Friedland 16 (ALAE) (Fr16.ALAE) 05a-Question
Model: 2019.Spring #24
Problem Type: Additive or Multiplicative approach for ALAE

Problem Use the additive approach to estimate the ultimate ALAE for AY 2019

cumulative paid claims:

AY	12	24	36	48
2017	4,300	13,900	20,900	22,800
2018	4,500	13,900	21,500	
2019	3,700	11,800		
2020	4,400			

cumulative paid ALAE:

AY	12	24	36	48
2017	116	507	803	866
2018	99	428	719	
2019	89	396		
2020	110			

selected ultimate claims by AY

AY	ult clms
2017	22,800
2018	23,129
2019	19,137
2020	21,398

<=== *sometimes you are not given the ultimate claims*
- you would then have to calculate them using an appropriate method
- see 2016.Spring #23

When selecting development factors, you may select a SIMPLE AVERAGE in this problem.

Step 1: Ratio of cumulative paid ALAE to cumulative paid claims:

AY	12	24	36	48
2017	2.70%	3.65%	3.84%	3.80%
2018	2.20%	3.08%	3.34%	
2019	2.41%	3.36%		
2020	2.50%			

Step 2: Development triangle (either additive or multiplicative as appropriate):

AY	12-24	24-36	36-48	48-		
2017	0.0095	0.0019	-0.0004		<===	ADDITIVE development
2018	0.0088	0.0026				
2019	0.0095					
2020						
selected	0.0093	0.0023	-0.0004	0.0000	<===	tail = 0.0 if additive OR 1.0 if multiplicative
cum	0.0112	0.0019	-0.0004	0.0000	<===	ADDITIVE: selected + (previous cum)
Ult Ratio	3.62%	3.55%	3.30%	3.80%	<===	ADDITIVE: cum + (latest diagonal from Step 1)

AY	2020	2019	2018	2017	<===	given information
ult clms	21,398	19,137	23,129	22,800		*(provided here for convenience)*
pd ALAE	110	396	719	866		

Step 3: Ultimate ALAE = (Ultimate Ratio) x (Ultimate Claims)
Unpad ALAE = (Ultimate ALAE) - (Paid ALAE)

AY	Ult ALAE	UnPd ALAE
2017	866.4	0.4
2018	763.3	44.3
2019	679.4	283.4
2020	774.6	664.6
	3,083.6	992.6

Step 4: ultimate ALAE for AY 2019 = 679.4 <=== final answer

Reading: Friedland 16 (ALAE) (Fr16.ALAE) 06a-Question
Model: 2019.Spring #24
Problem Type: Additive or Multiplicative approach for ALAE

Problem Use the additive approach to estimate the unpaid ALAE for AY 2020

cumulative paid claims:

AY	12	24	36	48
2017	5,100	13,900	20,600	22,200
2018	5,100	16,100	23,700	
2019	4,800	13,700		
2020	5,800			

cumulative paid ALAE:

AY	12	24	36	48
2017	107	458	747	838
2018	128	554	878	
2019	110	462		
2020	133			

selected ultimate claims by AY

AY	ult clms
2017	22,200
2018	25,855
2019	22,196
2020	27,008

<=== *sometimes you are not given the ultimate claims*
- you would then have to calculate them using an appropriate method
- see 2016.Spring #23

When selecting development factors, you may select a SIMPLE AVERAGE in this problem.

Step 1: Ratio of cumulative paid ALAE to cumulative paid claims:

AY	12	24	36	48
2017	2.10%	3.29%	3.63%	3.77%
2018	2.51%	3.44%	3.70%	
2019	2.29%	3.37%		
2020	2.29%			

Step 2: Development triangle (either additive or multiplicative as appropriate):

AY	12-24	24-36	36-48	48-		
2017	0.0119	0.0034	0.0014		<===	ADDITIVE development
2018	0.0093	0.0026				
2019	0.0108					
2020						
selected	0.0107	0.0030	0.0014	0.0000	<===	tail = 0.0 if additive OR 1.0 if multiplicative
cum	0.0151	0.0044	0.0014	0.0000	<===	ADDITIVE: selected + (previous cum)
Ult Ratio	3.80%	3.81%	3.84%	3.77%	<===	ADDITIVE: cum + (latest diagonal from Step 1)

AY	2020	2019	2018	2017	<===	given information
ult clms	27,008	22,196	25,855	22,200		*(provided here for convenience)*
pd ALAE	133	462	878	838		

Step 3: Ultimate ALAE = (Ultimate Ratio) x (Ultimate Claims)
Unpad ALAE = (Ultimate ALAE) - (Paid ALAE)

AY	Ult ALAE	UnPd ALAE
2017	836.9	(1.1)
2018	992.8	114.8
2019	845.7	383.7
2020	1,026.3	893.3
	3,701.7	1,390.7

Step 4: unpaid ALAE for AY 2020 = 893.3 <=== final answer