

φρονιμίο 4.

ML

	0	1	2	3
2019	$C_{10} = 30$	$C_{11} = 80$	$C_{12} = 190$	$C_{13} = 140$
2020	$C_{20} = 44$	$C_{21} = 110$	$C_{22} = 165$	
2021	$C_{30} = 65$	$C_{31} = 156$		
2022	$C_{40} = 65$			

Σύνολο

1/0 2/1 3/2

Συν. f_1 f_2 f_3

Επίδ. f_1

Συνολική επίδ. f_1 σε βάση π. π. π. :

$$f_1 = \frac{C_{11} + C_{21} + C_{31}}{C_{10} + C_{20} + C_{30}} = 2,489.$$

$$f_2 = \frac{C_{12} + C_{22}}{C_{11} + C_{21}} = 1,5$$

$$f_3 = \frac{C_{13}}{C_{12}} = 1,1667$$

~~Ανταρπώσεις (Στατιστική)~~

Έτος	Ανταρπώσεις (Στατιστική)	Τελική Επίδ.	Αντίστοιχο CL
2019	140	$\hat{C}_{13} = 140$	0
2020	165	$\hat{C}_{23} = 165 \cdot 1,1667 = 192,505$	$\hat{R}_2 = 27,5055$
2021	156	$\hat{C}_{33} = 156 \cdot 1,1667 \cdot 1,5 = 273,0078$	$\hat{R}_3 = 117,0078$
2022	65	$\hat{C}_{43} = 65 \cdot 2,489 \cdot 1,5 \cdot 1,1667 = 283,131$	$\hat{R}_4 = 218,131$
Σύνολο	526	888,6438	362,64

Мисол B-F

Мура баҳолаш	Баҳолаш	Баҳолаш	Баҳолаш	Баҳолаш
Ево)	Аҳоли	LR	V_1^{Prior}	Аҳоли B-F
2019	190	80%	140	200
2020	250	80%	200	1,607
2021	350	80%	280	1,8
2022	370	80%	296	2,489

$$F_3^{ult} = \frac{1}{f_3} = \frac{1}{1,1607} = 0,857$$

$$F_2^{ult} = \frac{1}{f_2 \cdot f_3} = 0,541$$

$$F_1^{ult} = \frac{1}{f_1 \cdot f_2 \cdot f_3} = 0,2296$$

Мисол 2.2.2. Баҳолаш

$$\hat{L}_{22} = F_3^{ult} \cdot V_2^{Prior} = 171,4$$

$$\hat{L}_{31} = F_2^{ult} \cdot V_3^{Prior} = 159,88$$

$$\hat{L}_{40} = F_1^{ult} \cdot V_4^{Prior} = 67,96$$

Аҳоли

Баҳолаш

$$\hat{R}_2^{BF} = 200 - 171,4 = 28,6$$

$$\hat{R}_3^{BF} = 200 - 159,88 = 120,12$$

$$\hat{R}_4^{BF} = 296 - 67,96 = 228,04$$

$$\hat{L}_{23}^{BF} = 165 + 28,6 = 193,6$$

$$\hat{L}_{33}^{BF} = 156 + 120,12 = 276,12$$

$$\hat{L}_{43}^{BF} = 65 + 228,04 = 293,04$$

N:DoDo₃ B-H

E_{w_i}	F_i^{ulr}	$\hat{R}_i^{C-L}$	$\hat{R}_i^{B-F}$	$\hat{R}_i^{B-H}$
2012	$F_3^{ulr} = 1$	0	0	0
2020	$F_2^{ulr} = 0,897$	$\hat{R}_2 = 27,5055$	28,6	27,662
2021	$F_2^{ulr} = 0,571$	$\hat{R}_2 = 117,0278$	120,12	118,342
2029.	$F_1^{ulr} = 0,2296$	$\hat{R}_1 = 218,131$	228,07	225,7

$$\hat{R}_1^{B-H} = F_3^{ulr} \hat{R}_2^{C-L} + (1 - F_3^{ulr}) \hat{R}_2^{B-F} = 27,662$$

$$\hat{R}_2^{B-H} = F_2^{ulr} \hat{R}_3^{C-L} + (1 - F_2^{ulr}) \hat{R}_3^{B-F} = 118,342$$

$$\hat{R}_3^{B-H} = F_1^{ulr} \hat{R}_4^{C-L} + (1 - F_1^{ulr}) \hat{R}_4^{B-F} = 225,7$$

Analog B-H.

(Tadok) (m...)

$$\hat{C}_{23}^{B-H} = F_3^{ulr} \hat{C}_{23}^{C-L} + (1 - F_3^{ulr}) \hat{C}_{23}^{B-H} = 192,662 = 165 + \hat{R}_2^{B-H} = \hat{C}_{22} + \hat{R}_2^{B-H}$$

$$\hat{C}_{22}^{B-H} = F_2^{ulr} \hat{C}_{33}^{C-L} + (1 - F_2^{ulr}) \hat{C}_{33}^{B-H} = 274,37 = 156 + 118,342 = 274,342$$

$$\hat{C}_{43}^{B-H} = F_1^{ulr} \hat{C}_{43}^{C-L} + (1 - F_1^{ulr}) \hat{C}_{43}^{B-H} = 290,68 = 65 + 225,7 = 290,7$$

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Мідопол C-C

$$L = \frac{190 + 165 + 156 + 65}{190 + 250 \cdot 0,857 + 350 \cdot 0,571 + 370 \cdot 0,2296} = 0,763368$$

Анодівна

$$\hat{R}_2 = (1 - F_3^{ult}) \cdot L \cdot P_2 = (1 - 0,857) \cdot 0,763368 \cdot 250 = 27,29$$

$$\hat{R}_3 = (1 - F_2^{ult}) \cdot L \cdot P_3 = (1 - 0,571) \cdot 0,763368 \cdot 350 = 114,6197$$

$$\hat{R}_4 = (1 - F_1^{ult}) \cdot L \cdot P_4 = (1 - 0,2296) \cdot 0,763368 \cdot 370 = 217,5965$$

Технік, Імпрі

$$C_{29}^{acc} = C_{22} + R_2 = 192,29$$

$$C_{37}^{acc} = C_{37} + R_3 = 156 + 114,6197 = 270,6197$$

$$C_{43}^{acc} = C_{40} + R_4 = 65 + 217,5965 = 282,5965$$

Мідопол Харліман

Моніторинг рівняння як інкрементальний

	0	1	2	3	P
2019	$x_{10} = 30$	$x_{11} = 50$	$x_{12} = 40$	$x_{13} = 20$	190
2020	$x_{20} = 44$	$x_{21} = 66$	$x_{22} = 55$		250
2021	$x_{30} = 65$	$x_{31} = 91$			350
2022	$x_{40} = 65$				370

$$w_1 = \frac{x_{10} + x_{20} + x_{30} + x_{40}}{p_1 + p_2 + p_3 + p_4} = 0,1759$$

$$w_2 = \frac{x_{11} + x_{21} + x_{31}}{p_1 + p_2 + p_3} = 0,262$$

$$w_3 = \frac{x_{12} + x_{22}}{p_1 + p_3} = 0,2159$$

$$w_4 = \frac{x_{13}}{p_1} = 0,1053$$

$$ELR = w_1 + w_2 + w_3 + w_4 = 0,7591$$

$$p_1 = \frac{w_1 + w_2 + w_3 + w_4}{w_1 + w_2 + w_3 + w_4} = 1$$

$$p_2 = \frac{w_1 + w_2 + w_3}{w_1 + w_2 + w_3 + w_4} = 0,8613$$

$$p_3 = \frac{w_1 + w_2}{w_1 + w_2 + w_3 + w_4} = 0,5769$$

$$p_4 = \frac{w_1}{w_1 + w_2 + w_3 + w_4} = 0,2317$$

To U_j^{ind} for $j \geq 1$, dpa:

$$U_2^{ind} = \frac{x_{20} + x_{21} + x_{22}}{p_2} = \frac{165}{0,8613} = 191,5709$$

$$U_3^{ind} = \frac{x_{30} + x_{31}}{p_3} = \frac{156}{0,5769} = 270,41$$

$$U_4^{ind} = \frac{x_{40}}{p_4} = \frac{65}{0,2317} = 280,5352$$

Arithmetic average of the
new estimates
(individual total ultimate
claims)

$$R_2^{ind} = q_2 U_2^{ind} = (1 - 0,8613) \cdot 191,5709 = 35,823$$

$$R_3^{ind} = q_3 U_3^{ind} = (1 - 0,5769) \cdot 270,41 = 114,4105$$

$$R_4^{ind} = q_4 U_4^{ind} = (1 - 0,2317) \cdot 280,5352 = 215,5352$$

Arithmetic average of the
analysis - (individual
total ultimate
reserves)

$$U_2^{BC} = P_2 \sum_{i=1}^4 m_i = 250 \cdot 0,7591 = 189,775$$

$$U_3^{BC} = P_3 \sum_{i=1}^4 m_i = 350 \cdot 0,7591 = 265,685$$

$$U_4^{BC} = P_4 \sum_{i=1}^4 m_i = 370 \cdot 0,7591 = 280,867$$

Ек на нрорпар (м.п.и)
лиди іс-і.

$$R_2^{coll} = q_2 \cdot U_2^{BC} = 26,3218$$

$$R_3^{coll} = q_3 \cdot U_3^{BC} = 112,411$$

$$R_4^{coll} = q_4 \cdot U_4^{BC} = 215,79$$

Зулторіки тедіки ногі
Анодіпето).

$$U_2^{coll} = C_{22} + R_2^{coll} = 191,3218$$

$$U_3^{coll} = C_{31} + R_3^{coll} = 268,41$$

$$U_4^{coll} = C_{40} + R_4^{coll} = 280,79$$

Зулторіки оуоліки тедіки
ногі аналігса.

Συναρτήσεις πλ. κλίσης

(κίβωτος) διαχωριστική.

1-bu b667 up 209 - 516 644 v

$$\delta_1 = d_1 r_0 + d_1 r_1 = 7,5 + 2 = 9,5 \quad (2)$$

$$\sigma_2 = \lambda_2 r_0 + \lambda_2 r_1 + \lambda_2 r_2 = 8 + 2 + 1,6 = 11,6 \quad (3)$$

$$\rightarrow r_0 + r_1 + r_2 = 1 \rightarrow \lambda_2(r_0 + r_1 + r_2) = 11,6 \Rightarrow \lambda_2 = 11,6$$

$$\lambda_2 r_2 = 1,6 \Rightarrow r_2 = 0,1379$$

$$S_1 = \lambda_1 (r_0 + r_1) = \lambda_1 (1 - r_2) = 9,5 \Rightarrow \lambda_1 = 11,0196$$

$$\lambda_1 r_1 + \lambda_2 r_1 = 4 \Rightarrow r_1 (b_1 + b_2) = 4 \Rightarrow$$

$$\Rightarrow r_1 = \frac{4}{11,0196 + 11,6} = 0,17684.$$

$$r_0 = 1 - r_1 - r_2 = 0,68526$$

$$\lambda_3 = \lambda_2 \cdot \frac{\lambda_2}{\lambda_1} = 12,2109$$

$$\lambda_3 r_1 = 12,2109 \cdot 0,17684 = 2,15939$$

$$\lambda_3 r_2 = 12,2109 \cdot 0,1379 = 1,6839$$

$$\lambda_4 = \lambda_3 \cdot \frac{\lambda_3}{\lambda_2} = 12,8539$$

$$\lambda_4 r_2 = 12,8539 \cdot 0,1379 = 1,77256$$

Summe aniden:

$$R = \lambda_3 r_2 \cdot n_2 + \lambda_3 r_1 \cdot n_3 + \lambda_4 r_2 \cdot n_3 =$$

$$= 1,6839 \cdot 8 + 2,15939 \cdot 10 + 1,77256 \cdot 10 = 52,79.$$