

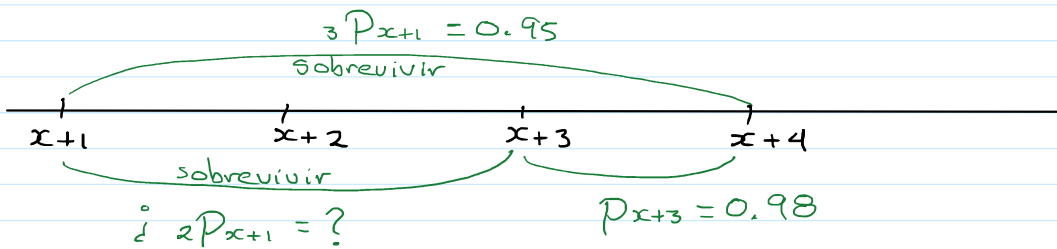
Continuación ejercicio 05

Datos : $P_x = 0.99$; $P_{x+1} = 0.985$; ${}_3P_{x+1} = 0.95$
 $q_{x+3} = 0.02$

1) $P_{x+3} = 0.98$

2) ${}_2P_x = 0.97515$

3) ${}_2P_{x+1} = 0.9694$

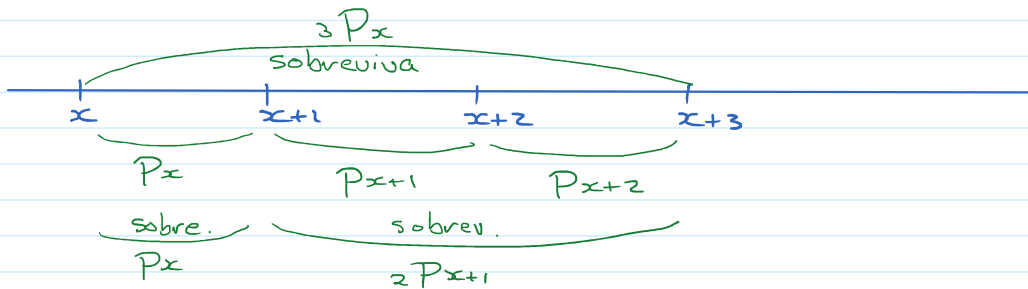


$\Rightarrow {}_3P_{x+1} = {}_2P_{x+1} \cdot P_{x+3}$

$\Rightarrow 0.95 = {}_2P_{x+1} \cdot 0.98$ $\therefore {}_2P_{x+1} = \frac{0.95}{0.98} = 0.9694$

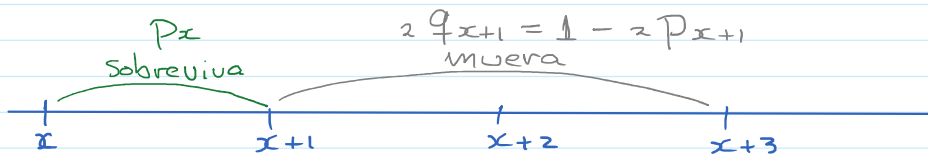
Nota : ${}_3P_{x+1} = P_{x+1} \cdot P_{x+2} \cdot P_{x+3}$
 $= P_{x+1} \cdot {}_2P_{x+2}$
 $= {}_2P_{x+1} \cdot P_{x+3}$

4) ${}_3P_x = P_x \cdot {}_2P_{x+1} = (0.99)(0.9694) = 0.9597$



5) ${}_{1|2}q_x = \mathbb{P}[1 < T_x \leq 3] = \mathbb{P}[T_x \leq 3] - \mathbb{P}[T_x \leq 1] = S_x(1) - S_x(3)$

P_x ${}_2q_{x+1} = 1 - {}_2P_{x+1}$



1er camino

$$= P_x \cdot 2q_{x+1} = P_x(1 - 2P_{x+1}) = (0.99)(1 - 0.9694) = 0.0303$$

2do camino

$$= 3q_x - 1q_x = {}_1P_x - {}_3P_x = 0.99 - 0.959694 = 0.0303$$

Ej: 06

$$S_0(x) = \left(\frac{70}{70+x}\right)^2 \quad \text{para } x \geq 0$$

1) $5|q_{40} = \mathbb{P}[5 < T_{40} \leq 6]$

$$= S_{40}(5) - S_{40}(6) = \frac{S_0(45)}{S_0(40)} - \frac{S_0(46)}{S_0(40)}$$

$$= \frac{\left(\frac{70}{70+45}\right)^2 - \left(\frac{70}{70+46}\right)^2}{\left(\frac{70}{70+40}\right)^2} = 0.01571 //$$

2) $l_{60} = \#$ esperada de sobrevivientes a edad 60

$$\text{Radix} = 100,000 = l_0$$

$$\rightarrow l_{60} = 100,000 \cdot S_0(60) = 100,000 \left(\frac{70}{70+60}\right)^2 = 28,994$$

$$d_{65} = l_{65} - l_{66}$$

$$= l_0 S_0(65) - l_0 S_0(66) = 393.93 \approx 394$$

Ejercicio 07

x	q_x	p_x
60	0.001	0.999
61	0.002	0.998
62	0.003	0.997
63	0.004	0.996
64	0.005	0.995

$${}_{2|3}q_{60} = {}_2p_{60} - {}_5p_{60} = S_{60}(2) - S_{60}(5)$$

$$= p_{60} \cdot p_{61} - p_{60} \cdot p_{61} \cdot p_{62} \cdot p_{63} \cdot p_{64}$$

$$= (0.999)(0.998) - (0.999)(0.998) \dots (0.995)$$

$$= 0.011917$$

Ej. 08

x	q_x	l_x	d_x
60	0.001	1,000,000	1000 = 100,000 (0.001)
61	0.002	999,000	1998 = 999,000 (0.002)
62	0.003	997,002	2,991
63	0.004	994,011	3,976
64	0.005	990,035	4,950
65	—	985,085	

$$\Rightarrow {}_{2|3}q_{60} = \frac{l_{62} - l_{65}}{l_{60}} = \frac{997,002 - 985,085}{1,000,000} = 0.011917$$

Ej. 09

x	q_x	l_x	d_x
1	0.02	9700	$d_1 = 194 = 9700(0.02)$ ①
2	0.02	② 9506	$d_2 = 190.12$ ③
3		④ 9316	232
4	0.026	⑤ 9084	$d_4 = 236.18$
5		<u>8848</u>	