

Interval	Observed Losses	Expected Losses
$(0, 2]$	5	
$(2, 5]$	5	
$(5, \infty)$	5	

Losses $\sim U(0, \theta)$

$$\sum_{j=1}^3 \frac{(E_j - O_j)^2}{O_j}$$

~~$E_j = P_j$~~

$$E_j = 15 \cdot P(\text{loss in interval})$$



$$E_1 = \left(\frac{2-0}{\theta}\right) \cdot 15 = 30\theta^{-1}$$

$$E_2 = \left(\frac{5-2}{\theta}\right) \cdot 15 = 45\theta^{-1}$$

$$E_3 = \left(\frac{\theta-5}{\theta}\right) \cdot 15 = 15 - 75\theta^{-1}$$

$$\sum_{j=1}^3 \frac{(E_j - O_j)^2}{O_j} = \frac{1}{5} \left[(30\theta^{-1} - 5)^2 + (45\theta^{-1} - 5)^2 + (15 - 75\theta^{-1} - 5)^2 \right]$$

$$\text{Derivative: } \frac{1}{5} \left[-2(30\theta^{-1} - 5)30\theta^{-2} - 2(45\theta^{-1} - 5)45\theta^{-2} + 2(10 - 75\theta^{-1})75\theta^{-2} \right]$$

$$-(30 - 5\theta)30 - 45($$

$$-(30 - 5\theta)30 - (45 - 5\theta)45 + (10\theta - 75)75$$

$$= -8550 + 1125\theta = 0$$

$$\hat{\theta} = 7.6$$