Tabla 2.19: Estimación del factor de frecuencia para varias distribuciones

Distribución	**Factor de Frecuencia, K_T**
Normal	$K_T = t$
Lognormal 2P	$K_T = \frac{\exp\left[s_y t - 0{,}5 s_y^2\right] - 1}{\left(\exp\left[s_y^2\right] - 1\right)^{0,5}}$ $\overline{y} = \frac{1}{n}\sum_{i=1}^{n} \ln x_i \qquad s_y^2 = \frac{1}{n}\sum_{i=1}^{n} \left(\ln x_i - \overline{y}\right)^2$
Lognormal 3P	$K_T = \frac{\exp\left[y_T - \overline{y} - 0{,}5 s_y^2\right] - 1}{\left(\exp\left[s_y^2\right] - 1\right)^{0,5}}$ $z_1 = \frac{s_X}{\overline{x}} \qquad w = 0{,}5\left[-g_X + \left(g_X^2 + 4\right)^{0,5}\right]$ $z_2 = \left(1 - w^{2/3}\right)/w^{1/3} \qquad a = \overline{x} - s_X/z_2$ $\overline{y} = \frac{1}{n}\sum_{i=1}^{n} \ln(x - a) \qquad s_y = \frac{1}{n}\sum_{i=1}^{n} \left[\ln(x - a) - \overline{y}\right]^2$
Gumbel	Max: $K_T = -\frac{\sqrt{6}}{\pi}\left\{0{,}5772 + \ln\left[\ln\left(1 - \frac{1}{T}\right)\right]\right\}$ si $n \to \infty$ $K_T = \frac{y_T - \overline{y}}{s_y}$ si $n = n$ con $y_T = -\ln\left[-\ln\left(1 - 1/T\right)\right]$ $\overline{y} = \frac{1}{n}\sum_{m=1}^{n} y_m \qquad s_y^2 = \frac{1}{n}\sum_{m=1}^{n} \left(y_m - \overline{y}\right)^2$ donde $y_m = -\ln\left[-\ln\left(\frac{n+1-m}{n+1}\right)\right]$ con serie ordenada de mayor $(m = 1)$ a menor $(m = n)$. Min: $K_T = \frac{\sqrt{6}}{\pi}\left\{0{,}5772 + \ln\left[\ln\left(\frac{1}{T}\right)\right]\right\}$ si $n \to \infty$ $K_T = -\frac{y_T - \overline{y}}{s_y}$ si $n = n$ ... con $y_m = \ln\left[-\ln\left(\frac{m}{n+1}\right)\right]$ con serie ordenada de menor $(m = 1)$ a mayor $(m = n)$.

Tabla 2.20: Estimación del factor de frecuencia para varias distribuciones. Cont.

Distribución	**Factor de Frecuencia, K_T**
Exponencial	$K_T = -\ln(1/T) - 1 \qquad \text{(max)}$ $K_T = -\ln(1 - 1/T) - 1 \qquad \text{(min)}$
Gamma	$K_T = \frac{2}{g_X}\left\{A^3 - 1\right\}$ $A = \left[\frac{g_X}{6}\left(t - \frac{g_X}{6}\right) + 1\right]$ $0 < g_X \leq 1$
Pearson Tipo III	$K_T = t + \left(t^2 - 1\right)d + \frac{1}{3}\left(t^3 - 6t\right)d^2$ $-\left(t^2 - 1\right)d^3 + td^4 + \frac{1}{3}d^5$ con $d = \frac{\widetilde{g}_X}{6}$ y $\widetilde{g}_X = g_X \frac{[n(n-1)]^{0,5}}{n-2}\left(1 + \frac{8,5}{n}\right)$
Log Pearson Tipo III	Calcular K_T con los logaritmos de x usando Pearson Tipo III
Fréchet	$K_T = \frac{[-\ln(1-1/T)]^{-1/\theta} - \Gamma(1-1/\theta)}{[\Gamma(1-2/\theta) - \Gamma^2(1-1/\theta)]^{0,5}}$ con θ estimado con el respectivo método
Weibull	$K_T = A + B\left\{\left[-\ln\left(1 - \frac{1}{T}\right)\right]^{1/\kappa} - 1\right\}$ $A = \frac{\widehat{\alpha} + \widehat{b} - \widehat{\mu}_Z}{\widehat{\sigma}_Z} \qquad B = \frac{\widehat{\alpha}}{\widehat{\sigma}_Z}$ con $\widehat{\alpha}$, κ, $\widehat{b}$, $\widehat{\mu}_Z$ y $\widehat{\sigma}_Z$ estimados con el respectivo método
GEV	$K_T = \frac{\widehat{b}}{\lvert\widehat{b}\rvert}\frac{\Gamma\left[1+\widehat{b}\right] - [-\ln(1-1/T)]^{\widehat{b}}}{\left\{\Gamma\left[1+2\widehat{b}\right] - \Gamma^2\left[1+\widehat{b}\right]\right\}^{0,5}}$
GPD	$K_T = \frac{(1+2\widehat{a})^{0,5}}{\widehat{a}}\left[(1+\widehat{a})\left(1 - T^{-\widehat{a}}\right) - \widehat{a}\right]$ con $\widehat{a}$ estimado con el respectivo método

$$1 - \frac{1}{T} = \int_{-\infty}^{t} \frac{1}{\sqrt{2\pi}} \exp\left[-\frac{x^2}{2}\right] dx$$

Kite (1977), Rao y Hamed (2000), Heo y Salas (1996)