

ECQ: Short User's Manual

Steps to follow:

- Input: Selected independent extremes to be pasted in ranked order (highest value first) in the column B.
- Optional in Input: Specify the name of the dataset in Cell E3.
- Main: Evaluate the results based on the UH plot, the exponential Q-Q plot, the Pareto Q-Q plot (and optional: the Weibull Q-Q plot):
 - Specify the optional parameters:
 - No bias (0) or bias (1) correction to the slope calculation in the selected Q-Q plot (select 0 when no use is made of this option); for 1 select also the ρ value
 - Weighting factors: 0 for weighting factors 1 and 0 for the Hill weighting factors (by default, the Hill factors are used)
 - The type of regression in the Q-Q plot to be considered: 0 for an unconstrained regression (non-fixed threshold), 1 for a constrained regression (fixed threshold)
 - When censoring of the highest values has to be considered, specify the number of values to be censored (the censoring threshold rank) (select 0 when no censoring is considered)
 - Select the type of Q-Q plot to be evaluated and press the “Calculate” button to calculate the Q-Q plot, to conduct the regression and to calculate the MSE of the regression line, for all possible threshold ranks
 - Look at the Q-Q plot (button “Q-Q plot”); and at the path of the slope and the MSE of the regression line for increasing threshold ranks (button “Slope Q-Q plots”); and evaluate the linearity of the points in the tail of the distribution.
 - Repeat this procedure for the different Q-Q plots
- Make a decision on the sign of the extreme value index (the distribution type) as calibration result (1 when selecting a normal tail (exponential or Gumbel distribution), 2 when selecting a heavy tail (GPD or GEV distribution with $\gamma > 0$), 3 when selecting the Weibull class.
- Select the optimal threshold based on the Chart “Slope Q-Q plot”; and specify the rank number of this optimal threshold in ‘Selection optimal threshold’. For this selected threshold:

- the estimated slope in the Q-Q plot is shown in ‘Slope Q-Q plot at selected threshold’; and also graphically shown by the line in the Chart “Slope Q-Q plot”
 - the calibrated extreme value distribution is shown as a regression line in Chart “Q-Q plot”
 - the calibrated parameter values of this extreme value distribution are shown as ‘Calibration results’
- Optional: the UH-estimator of the extreme value distribution can be derived by specifying the optimal threshold for this estimator on the basis of the UH-plot. Specify the rank number of this optimal threshold in ‘Selection optimal threshold’. For this selected threshold, the estimated extreme value index is shown in ‘Slope Q-Q plot at selected threshold’; and also graphically shown by the line in the Chart “Slope UH-plot”.