Hybrid conditional plot of goodness-of-fit for Gumbel distribution

ABSTRACT

A Gumbel model is an extreme value model that describes the event of extreme behaviour. The Gumbel model has an exponential tail. Generally, the goodness-of-fit for the Gumbel model is evaluated by the graphical form of probability plot (PP) and quantiles plot (QQ). The model fits the observed values if the probability and the quantiles of the hypothetical distribution are linearly plotted against that of the observed values. However, the QQ plot is quite sensitive to the deviation at the tail of the plot, as opposed to the PP plot which is somewhat robust. Thus, distribution of extreme values is likely to deviate from the linear line at the tail of the QQ plot. An alternative approach of plotting the Gumbel model is given, in which the approach is expected to produce the linear plot. The conditional plot and stabilised plot are employed and the performances of both are compared. The plots are transformed into the hybrid plot so that the departures of the hypothetical quantiles values from the observed quantiles values are illustrated. The result shows that the hybrid conditional QQ plot is a better plot of goodness-of-fit for Gumbel model.

Keyword: Gumbel; QQ plot; Conditional plot; Stabilised plot; Hybrid plot