Role of quantile based reliability concepts in the study of income inequality measures

Curves that measure inequality in incomes have been a topic of immense interest for more than a century ever since the work of Lorenz in 1905. A measure of income inequality is designed to provide an index that can abridge the variations prevailing in income among the individuals in a group. Different forms of curves and summary indices of inequality measurement were discussed along with their justifications through applications to real data.

A probability distribution can be specified in two ways namely (i) in terms of the distribution function and (ii) in terms of the quantile function. There are many properties for quantile functions that are not shared by distribution functions even though both of them convey the same information about the distribution. In many cases, quantile function provides a straight forward analysis and in many situations it permits the use of distributions which have no closed form.

More aspects on the Zenga measure as well as other income inequality measures using quantile function approach are included. We also look into the application and interpretation of the inequality measure in the reliability context. Usually in reliability based works, the ageing properties are studied using the monotonic behaviour of certain reliability concepts. Here we look at the problem from another point of view by utilizing the truncated L moments which have their own economic interpretations.