A Modified Simultaneous Confidence Intervals
for The Geometric Mean of Scale Parameters

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Abstract

Wu and Chen [5] proposed the equal tail simultaneous confidence intervals (SCI) for the scale parameters with their geometric mean for scale families including the normal and exponential populations. In this article, a modified SCI with moderately shorter expected length is investigated and proved to have shorter expected length. The Bonferroni inequality used to bound the probability of confidence intervals and the Pearsonian four moment approximation to the sampling distribution of the univariate log chi-square ratio statistic are utilized jointly to obtain the approximate critical values. In order to solve the problem of nonconvergence for some cases of combinations of population size and sample sizes, the ten points interpolation approximation method is employed here. Statistical tables to implement these procedures for the case of equal sample sizes are provided for use in practice. Finally, an asymptotic result applying the stabilized variance methodology in Kendall and Stuart [4] is also proposed.

Keywords: Bonferroni Inequality, Pearsonian System, Simulation.