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Confidence Intervals for Coefficient of Variation of Lognormal Distribution with Restricted Parameter Space

Sa-aat Niwitpong

Department of Applied Statistics
 King Mongkut's University of Technology
 North Bangkok, Thailand
 snw@kmutnb.ac.th

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Abstract

This paper presents the new confidence interval for the coefficient of variation of lognormal distribution with restricted parameter. We proved the coverage probability and expected length of our proposed confidence interval.

Mathematics Subject Classification: 62F25

Keywords: Lognormal distribution, the mean, restricted parameter space

1 Introduction

Let $X = (X_1, X_2, \dots, X_n)$ be a random variable having a lognormal distribution, and μ and σ^2 , respectively, are denoted by the mean and the variance of Y where $Y = \ln(X) \sim N(\mu, \sigma^2)$. The probability density function of the lognormal distribution, $LN(\mu, \sigma^2)$, is

$$f(x, \mu, \sigma^2) = \begin{cases} \frac{1}{x\sigma\sqrt{2\pi}} \exp\left(-\frac{(\ln(x) - \mu)^2}{2\sigma^2}\right) & ; \text{ for } x > 0 \\ 0 & ; \text{ for } x \leq 0. \end{cases} \quad (1)$$