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Estimating the Parameters of the Generalized Lambda Distribution: Which Method Performs Best?

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Abstract

Generalized lambda distribution (GLD) is a flexible distribution that can represent a wide variety of distributional shapes. This property of the GLD has made it very popular in simulation input modeling in recent years, and several fitting methods for estimating the parameters of the GLD have been proposed. Nevertheless, there appears to be a lack of insights about the performances of these fitting methods in estimating the parameters of the GLD for a variety of distributional shapes and input data. Our primary goal in this article is to compare the goodness-of-fits of the popular fitting methods in estimating the parameters of the GLD introduced in Freimer et al. (1988), i.e., Freimer–Mudholkar–Kollia–Lin (FMKL) GLD, and provide guidelines to the simulation practitioner about when to use each method. We further describe the use of the genetic

algorithm for the FMKL GLD, and investigate the performances of the suggested methods in modeling the daily exchange rates of eight currencies.

Keywords:

Generalized lambda distribution | Genetic algorithm | Least-squares | Method of matching percentiles | Parameter estimation

Mathematics Subject Classification:

Primary 62 | Secondary 62H10; 62F10; 62P05; 6207

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