



A New Class of Distribution Over Bounded Support and Its Associated Regression Model

Ishfaq S. Ahmad¹ · Rameesa Jan² · Poonam Nirwan³ · Peer Bilal Ahmad¹

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Abstract

In this paper, a new two-parameter distribution over the bounded support $(0,1)$ is introduced and studied in detail. Some of the interesting statistical properties like concavity, hazard rate function, mean residual life, moments and quantile function are discussed. The method of moments and maximum likelihood estimation methods are used to estimate unknown parameters of the proposed model. Besides, finite sample performance of estimation methods are evaluated through the Monte-Carlo simulation study. Application of the proposed distribution to the real data sets shows a better fit than many known two-parameter distributions on the unit interval. Moreover, a new regression model as an alternative to various unit interval regression models is introduced.

Keywords Beta distribution · Covariates · Log-concave · Monte Carlo simulation · Regression

1 Introduction

Various domains of spheres like engineering, insurance, medical sciences, etc. place a high value on gathering information from data for decision-making [1, 2]. Data scientists constantly try to meet this requirement. Finding a distribution that best describes the data sets is a first crucial step in this direction. Distributions are, therefore, essential for data scientists [3, 4] and other users of data to employ for inferential reasons.

✉ Ishfaq S. Ahmad
peerishfaq007@gmail.com

¹ Department of Mathematical Sciences, Islamic University of Science and Technology, Awantipora, Pulwama, J&K 192122, India

² Department of Statistics, Government Degree College Sopore, Sopore, Baramulla, J&K 193201, India

³ 198A 1st A Road, Shardapura, Jodhpur, Rajasthan 342003, India