

ΟΙΚΟΝΟΜΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
ΤΜΗΜΑ ΣΤΑΤΙΣΤΙΚΗΣ



ΠΕΜΠΤΗ 22/5/2014
11:00 – 12:00

ΑΙΘΟΥΣΑ 607, 6^{ος} ΟΡΟΦΟΣ,
ΚΤΙΡΙΟ ΜΕΤΑΠΤΥΧΙΑΚΩΝ ΣΠΟΥΔΩΝ
(ΕΥΕΛΠΙΔΩΝ & ΛΕΥΚΑΔΟΣ)

Debasis Kundu

Department of Mathematics and Statistics
Indian Institute of Technology Kanpur

On Bivariate (Marshall-Olkin) Weibull Geometric Distribution

ΠΕΡΙΛΗΨΗ (ΣΤΑ ΑΓΓΛΙΚΑ)

Marshall and Olkin (1997, *Biometrika*) provided a general method to introduce a parameter into a family of distributions, and discussed in details about the exponential and Weibull families. They have also briefly introduced the bivariate extension, although not any properties or inferential issues have been explored, mainly due to analytical intractability of the general model. In this paper we consider the bivariate model with a special emphasis on the Weibull distribution. We call this new distribution as the bivariate (Marshall-Olkin) Weibull geometric distribution. We derive different properties of the proposed distribution, and it is observed that the proposed distribution can be obtained from the Ali-Mikhail-Haq copula. Using the copula structure several dependency measures and dependency properties have been investigated. The maximum likelihood estimators cannot be obtained in closed form, and we propose to use the EM algorithm, and it is observed that the implementation of the EM algorithm is quite straight forward. Two data sets have been analyzed for illustrative purposes, and it is observed that the new model and the proposed EM algorithm work quite well in these cases.

**ATHENS UNIVERSITY OF ECONOMICS & BUSINESS
DEPARTMENT OF STATISTICS**



Thursday 22/5/2014
11:00 – 12:00

**ROOM 607, 6th FLOOR,
POSTGRADUATE STUDIES BUILDING
(EVELPIDON & LEFKADOS)**

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ABSTRACT

Marshall and Olkin (1997, *Biometrika*) provided a general method to introduce a parameter into a family of distributions, and discussed in details about the exponential and Weibull families. They have also briefly introduced the bivariate extension, although not any properties or inferential issues have been explored, mainly due to analytical intractability of the general model. In this paper we consider the bivariate model with a special emphasis on the Weibull distribution. We call this new distribution as the bivariate (Marshall-Olkin) Weibull geometric distribution. We derive different properties of the proposed distribution, and it is observed that the proposed distribution can be obtained from the Ali-Mikhail-Haq copula. Using the copula structure several dependency measures and dependency properties have been investigated. The maximum likelihood estimators cannot be obtained in closed form, and we propose to use the EM algorithm, and it is observed that the implementation of the EM algorithm is quite straight forward. Two data sets have been analyzed for illustrative purposes, and it is observed that the new model and the proposed EM algorithm work quite well in these cases.