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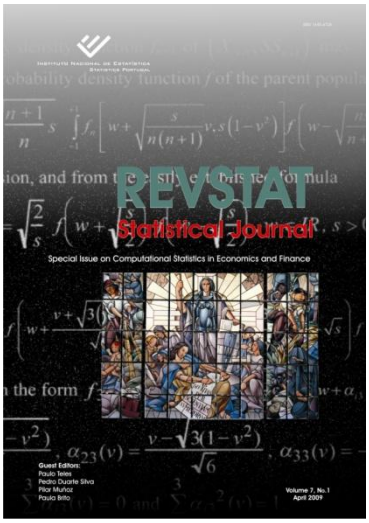

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This Volume of **REVSTAT: Volume 11, No. 3 - November 2013**, includes five articles. Their abstracts are presented below:

AN ACCURATE APPROXIMATION TO THE DISTRIBUTION OF A LINEAR COMBINATION OF NON-CENTRAL CHI-SQUARE RANDOM VARIABLES

Authors: *Hyung-Tae Ha* and *Serge B. Provost.*

This paper provides an accessible methodology for approximating the distribution of a general linear combination of non-central chi-square random variables. Attention is focused on the main application of the results, namely the distribution of positive definite and indefinite quadratic forms in normal random variables. After explaining that the

moments of a quadratic form can be determined from its cumulants by means of a recursive formula, we propose a moment-based approximation of the density function of a positive definite quadratic form, which consists of a gamma density function that is adjusted by a linear combination of Laguerre polynomials or, equivalently, by a single polynomial. On expressing an indefinite quadratic form as the difference of two positive definite quadratic forms, explicit representations of approximations to its density and distribution functions are obtained in terms of confluent hypergeometric functions. The proposed closed form expressions converge rapidly and provide accurate approximations over the entire support of the distribution. Additionally, bounds are derived for the integrated squared and absolute truncation errors. An easily implementable algorithm is provided and several illustrative numerical examples are presented. In particular, the methodology is applied to the Durbin–Watson statistic. Finally, relevant computational considerations are discussed. Linear combinations of chi-square random variables and quadratic forms in normal variables being ubiquitous in statistics, the distribution approximation technique introduced herewith should prove widely applicable.

MULTIPLICATIVE CENSORING: ESTIMATION OF A DENSITY AND ITS DERIVATIVES UNDER THE L_p-RISK

Authors: *Mohammad Abbaszadeh, Christophe Chesneau* and *Hassan Doosti*.

We consider the problem of estimating a density and its derivatives for a sample of multiplicatively censored random variables. The purpose of this paper is to present an approach to this problem based on wavelets methods. Two different estimators are developed: a linear based on projections and a nonlinear using a term-by-term selection of the estimated wavelet coefficients. We explore their performances under the L_p-risk with $p \geq 1$ and over a wide class of functions: the Besov balls. Fast rates of convergence are obtained. Finite sample properties of the estimation procedure are studied on a simulated data example.

ON THE ESTIMATION OF THE SECOND ORDER PARAMETER FOR HEAVY-TAILED DISTRIBUTIONS

Authors: *El hadji Deme, Laurent Gardes* and *Stéphane Girard*.

The extreme-value index γ is an important parameter in extreme-value theory since it controls the first order behavior of the distribution tail. In the literature, numerous estimators of this parameter have been proposed especially in the case of heavy-tailed distributions, which is the situation considered here. Most of these estimators depend on the k largest observations of the underlying sample. Their bias is controlled by the second order parameter ρ. In order to reduce the bias of γ's estimators or to select the best number k of observations to use, the knowledge of ρ is essential. In this paper, we propose a simple approach to estimate the second order parameter ρ leading to both existing and new estimators. We establish a general result that can be used to easily prove the asymptotic normality of a large number of estimators proposed in the literature or to compare different estimators within a given family. Some illustrations on simulations are also provided.

TWO NONPARAMETRIC ESTIMATORS OF THE MEAN RESIDUAL LIFE

Authors: *Abdel-Razzaq Mugdadi* and *Amanuel Teweldemedhin*.

The mean residual life function $L(t)$ can be written based on the vitality function $V(t)$. In this article we propose two methods to estimate $V(t)$. The two methods are based on both the kernel density estimation and the empirical function. In addition, we evaluate the mean square error of the two estimators and we study the consistency for both of them.

A GENERALIZED SKEW LOGISTIC DISTRIBUTION

Authors: *A. Asgharzadeh, L. Esmaeili, S. Nadarajah* and *S.H. Shih*.

In this paper, we introduce a generalized skew logistic distribution that contains the usual skew logistic distribution as a special case. Several mathematical properties of the distribution are discussed like the cumulative distribution function and moments. Furthermore, estimation using the method of maximum likelihood and the Fisher information matrix are investigated. Two real data applications illustrate the performance of the distribution.