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This Volume of **REVSTAT: Volume 14, No. 1 – February 2016**, presents the following scientific articles:

**GENERAL MULTIVARIATE DEPENDENCE USING ASSOCIATED COPULAS**

Author: *Yuri Salazar Flores*

**GOODNESS OF FIT TESTS AND POWER COMPARISONS FOR WEIGHTED GAMMA DISTRIBUTION**

Authors: *Neetu Singla, Kanchan Jai and Suresh Kumar Sharma*

**HIERARCHICAL DYNAMIC BETA MODEL**

Authors: *Cibele Queiroz da-Silv and Helio dos Santos Migon*

**ON THE BOUNDS FOR DIAGONAL AND OFF-DIAGONAL ELEMENTS OF HAT MATRIX IN THE LINEAR REGRESSION MODEL**

Author: *Mohammad Mohammadi*

**SHAPIRO-WILK TEST WITH KNOWN MEAN**

Authors: *Zofia Hanusz, Joanna Tarasińska and Wojciech Zielinski*



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This Volume of **REVSTAT: Volume 14, No. 1 - February 2016**, includes five articles. Their abstracts are presented below:

### **GENERAL MULTIVARIATE DEPENDENCE USING ASSOCIATED COPULAS**

Author: *Yuri Salazar Flores.*

This paper studies the general multivariate dependence and tail dependence of a random vector. We analyse the dependence of variables going up or down, covering the  $2^d$  orthants of dimension  $d$  and accounting for non-positive dependence. We extend definitions and results from positive to general dependence using the associated copulas. We study several properties of these copulas and present general versions of the tail dependence functions and tail dependence coefficients. We analyse the perfect dependence models, elliptical copulas and Archimedean copulas. We introduce the monotonic copulas and prove that the multivariate Student's  $t$  copula accounts for all types of tail dependence simultaneously while Archimedean copulas with strict generators can only account for positive tail dependence.

### **GOODNESS OF FIT TESTS AND POWER COMPARISONS FOR WEIGHTED GAMMA DISTRIBUTION**

Authors: *Neetu Singla, Kanchan Jai and Suresh Kumar Sharma.*

In this paper, a weighted version of Gamma distribution known as Weighted Gamma (WG) distribution has been considered. Various tests of goodness of fit viz Kolmogorov–Smirnov, Cramér–von Mises and Anderson–Darling have been applied to this family. Monte Carlo simulations have been carried out for power calculations. The powers of these tests have been compared which helps in ranking of these goodness of fit tests.

### **HIERARCHICAL DYNAMIC BETA MODEL**

Authors: *Cibele Queiroz da-Silv and Helio dos Santos Migon.*

We develop a hierarchical dynamic Bayesian beta model for modelling a set of time series of rates or proportions. The proposed methodology enables to combine the information contained in different time series so that we can describe a common underlying system, which is though flexible enough to allow the incorporation of random deviations, related to the individual series, not only through time but also across series. That allows to fit the case in which the observed series may present some degree of level shift. Additionally, the proposed model is adaptive in the sense that it incorporates precision parameters that can be heterogeneous not only over time but also across the series. Our methodology was applied to both real and simulated data. The real data sets used in this article include three time series of

Brazilian monthly unemployment rates, observed in the cities of Recife, São Paulo and Porto Alegre, in the period from March 2002 to March 2012. A new parametrization of the precision parameter makes possible the use of the same type of link function for both the mean and the precision parameters, which are then expressed in the (0,1) interval, providing a more meaningful interpretation in terms of the magnitude of the scale.

### **ON THE BOUNDS FOR DIAGONAL AND OFF-DIAGONAL ELEMENTS OF HAT MATRIX IN THE LINEAR REGRESSION MODEL**

Author: *Mohammad Mohammadi*.

In the least squares analysis, an appropriate criterion to detect potentially influential observations, either individually or jointly, deals with the values of corresponding Hat matrix elements. Hence, some conditions for which these elements give the extreme values are interesting in the model sensitivity analysis. In this article, we find a new and sharper lower bound for off-diagonal elements of the Hat matrix in the intercept model, which is shorter than those for the no-intercept model. We give necessary and sufficient conditions on the space of design matrix, under which the corresponding Hat matrix elements get desired extreme values.

### **SHAPIRO-WILK TEST WITH KNOWN MEAN**

Authors: *Zofia Hanusz, Joanna Tarasińska and Wojciech Zielinski*

An adaptation of the Shapiro–Wilk  $W$  test to the case of normality with a known mean is considered. The table of critical values for different sample sizes and several significance levels is given. The power of the test is investigated and compared with the Kolmogorov test and the two-step procedure consisting of the Shapiro–Wilk  $W$  and  $t$  tests. Additionally, the normalizing coefficients for the test statistic are given..

In 2003 the Statistics Portugal launched the scientific statistical journal REVSTAT-Statistical Journal, published in English two times a year, with a prestigious international Editorial Board, which came to substitute the Revista de Estatística [Statistical Review], published in Portuguese between 1996 and 2002.

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