

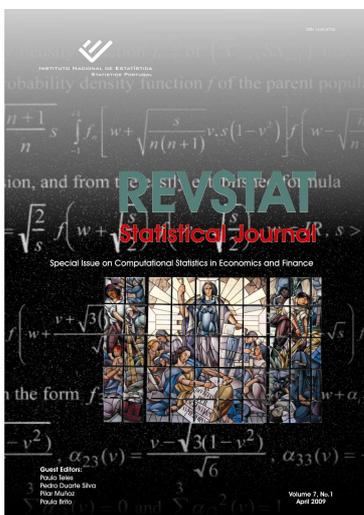
28 April, 2009

## Estatísticas Gerais

Volume 7, Number 1, April 2009

### REVSTAT- STATISTICAL JOURNAL

REVSTAT-STATISTICAL JOURNAL, Volume 7, No. 1 – April 2009



In 2003 the National Statistical Institute 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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This Volume of **REVSTAT: Volume 7, No. 1 - April 2009**, is about "**Computational Statistics in Economics and Finance**" and includes eight articles. Their abstracts are presented below:

#### A METHOD OF TREND EXTRACTION USING SINGULAR SPECTRUM ANALYSIS

Author: *Theodore Alexandrov*.

The paper presents a new method of trend extraction in the framework of the Singular Spectrum Analysis (SSA) approach. This method is easy to use, does not need specification of models of time series and trend, allows to extract trend in the presence of noise and oscillations and has only two parameters (besides basic SSA parameter called window length). One parameter manages scale of the extracted trend and another is a method specific threshold value. We propose procedures for the choice of the parameters. The presented method is evaluated on a simulated time series with a polynomial trend and an oscillating component with unknown period and on the seasonally adjusted monthly data of unemployment level in Alaska for the period 1976/01–2006/09.

**THE SVM APPROACH FOR BOX–JENKINS MODELS**

Authors: *Saeid Amiri, Dietrich von Rosen and Silvelyn Zwanzig.*

Support Vector Machine (SVM) is known in classification and regression modeling. It has been receiving attention in the application of nonlinear functions. The aim is to motivate the use of the SVM approach to analyze the time series models. This is an effort to assess the performance of SVM in comparison with ARMA model. The applicability of this approach for a unit root situation is also considered.

**PREWHITENING-BASED ESTIMATION IN PARTIAL LINEAR REGRESSION MODELS: A COMPARATIVE STUDY**

Authors: *Germán Aneiros-Pérez and Juan Manuel Vilar-Fernández.*

The problem of semiparametric modelling in time series is considered. For this, partial linear regression models are used, that is, regression models where the regression function is the sum of a linear and a nonparametric component. Two estimators for the nonparametric component are shown: one estimator takes into account the dependence structure in the errors of the regression function and the another estimator not. Both estimators are compared in practice for several real time series concerning economics and finance. In addition to the partial linear regression model, other regression models are included in the comparison.

**AN INSURANCE TYPE MODEL FOR THE HEALTH COST OF COLD HOUSING: AN APPLICATION OF GAMLSS**

Authors: *Robert Gilchrist, Alim Kamara and Janet Rudge.*

This paper introduces a substantive problem, namely the link between fuel poverty and excess winter morbidity amongst older people, and shows how the GAMLSS suite of programs ([www.gamlss.com](http://www.gamlss.com)) can be used to provide a very flexible method of modelling both the number of hospital admissions and the corresponding lengths of stay in hospital. The approach is closely related to the models that have been used to model the number of insurance claims, and their cost (see Heller et al. (2007)). We fit the Beta Binomial distribution and a variety of continuous distributions.

**DETECTING SOCIAL INTERACTIONS IN BIVARIATE PROBIT MODELS WITH AN ENDOGENOUS DUMMY VARIABLE: SOME SIMULATION RESULTS**

Author: *Johannes Jaenicke.*

This paper analyzes the possibility of detecting observable and non-observable social interactions in a bivariate probit model with an endogenous dummy regressor via Monte Carlo simulation. In small samples, we find severe size distortions of the Wald test and only a low probability of detecting observable and non-observable social interactions. In large samples, however, we find this test to be very powerful.

**FILTERS FOR SHORT NONSTATIONARY SEQUENCES: THE ANALYSIS OF THE BUSINESS CYCLE**

Author: *D.S.G. Pollock.*

This paper gives an account of some techniques of linear filtering which can be used for extracting the business cycle from economic data sequences of limited duration. It is argued that there can be no definitive definition of the business cycle. Both the definition of the business cycle and the methods that are used to extract it must be adapted to the purposes of the analysis; and different definitions may be appropriate to different eras.

**PARAMETER ESTIMATION FOR INAR PROCESSES BASED ON HIGH-ORDER STATISTICS**

Authors: *Isabel Silva* and *M. Eduarda Silva*.

The high-order statistics (moments and cumulants of order higher than two) have been widely applied in several fields, specially in problems where it is conjectured a lack of Gaussianity and/or non-linearity. Since the INteger-valued AutoRegressive, INAR, processes are non-Gaussian, the high-order statistics can provide additional information that allows a better characterization of these processes. Thus, an estimation method for the parameters of an INAR process, based on Least Squares for the third-order moments is proposed. The results of a Monte Carlo study to investigate the performance of the estimator are presented and the method is applied to a set of real data.

**FORECASTING IN INAR(1) MODEL**

Authors: *Nélia Silva*, *Isabel Pereira* and *M. Eduarda Silva*.

In this work we consider the problem of forecasting integer-valued time series, modelled by the INAR(1) process introduced by McKenzie (1985) and Al-Osh and Alzaid (1987). The theoretical properties and practical applications of INAR and related processes have been discussed extensively in the literature but there is still some discussion on the problem of producing coherent, i.e. integer-valued, predictions. Here Bayesian methodology is used to obtain point predictions as well as confidence intervals for future values of the process. The predictions thus obtained are compared with their classic counterparts. The proposed approaches are illustrated with a simulation study and a real example.