

**METODY WNIOSKOWANIA STATYSTYCZNEGO W BADANIACH EKONOMICZNYCH
(METHODS OF STATISTICAL INFERENCJE IN ECONOMIC SURVEYS)**

Komitet Redakcyjny

Krystyna Lisiecka (przewodnicząca), Anna Lebda-Wyborna (sekretarz), Halina Henzel, Marian Sołtysik, Janusz Wywiół, Anna Kostur,
Maria Michałowska, Grażyna Musiał, Irena Pyka, Stanisław Stanek, Stanisław Swadźba, Teresa Żabińska

Redaktor naukowy

Józef Kolonko
Janusz L. Wywiół

Recenzent

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Kszysztof Piasecki
Aleksandra Plikusas
Andrzej Sokołowski
Józef Stawicki
Jacek Wesółowski

Redaktor

Patrycja Keller

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STRESZCZENIA

ON COMPOSITE ESTIMATION UTILIZING REGRESSION AND CLASSIFICATION METHOD

Abstract

Several estimation procedure have been developed to compensate for the deterioration in properties of parameter estimates resulting from sample data incompleteness. Most of them make use of available auxiliary data following one of two general approaches. The first approach relies on dependencies between auxiliary variables and the variable under study. This usually leads to the construction of various ratio and regression estimators. The second approach explores dependencies between auxiliary variables and response behaviour of population units. This provides motivation to a broad range of methods such as weighting adjustments and classification estimators. In this paper a composite estimator of the population mean incorporating both approaches is considered. It is constructed as a combination of the well-known regression estimator and a classification estimator utilizing Bayesian quadratic discrimination function. The weights of the combination reflect the regression model's goodness of fit and the classification quality. Hence, greater weight is assigned to the estimator for which available observations of auxiliary variables are more useful. Simulation results exposing its properties are presented in the paper.

ON APPLICATION OF NON RESPONSE MODEL IN INTERNET SURVEY SAMPLING

Abstract

The paper deals with a problem of estimating the total on the basis of data observed on Internet sample. The Poisson sampling design without replacement is used as a basic model of generation of Internet sample. Its particular case is so called the Bernoulli sampling design without replacement when all the response probabilities are the same. Some estimators (including logit type one) of the population mean as well as of the total are considered. Their variances are evaluated and their estimators, too.

SAMPLING DESIGN PROPORTIONAL TO POSITIVE FUNCTION OF ORDER STATISTICS OF AUXILIARY VARIABLE

Abstract

The sampling design proportional to some positive function of an auxiliary variable is considered. Its characteristics are derived on the basis of well known combinatoric definitions and theorems. For instance, it is well known the sampling design proportional to the sample mean, see Lahiri (1951). The sampling design proportional to the value of an order statistics of an auxiliary variable was prepared by Wywił (2004, 2007). In this paper that sampling design is generalized in the following way. The sampling design proportional to the positive function of order statistics of the auxiliary variable is defined and its basic properties are considered. Its inclusion probabilities are derived. This let to use the Horvitz-Thompson statistic to estimation population mean value of an variable under study. The sampling scheme implementing the sampling design is proposed, too. Particular cases of the proposed sampling design are as follows. The sampling design proportional to the sample second L-statistics of the auxiliary variable. Sampling design proportional to the sample range of the auxiliary variable. It is useful to construction sampling strategy using estimators of the regression coefficients based on order statistics of the auxiliary variable.

ON PREDICTION OF TOTALS FOR DOMAINS DEFINED BY RANDOM ATTRIBUTES

Abstract

The problem of prediction of domain totals is widely discussed in the small area estimation literature (e.g. Rao 2003). In the classic approach it assumed that the population is divided into disjoint domains and sum of domains gives the whole set of population elements. In this paper we define random variables which realizations inform if the i -th population element has the attribute d (belongs to the d -th random domain). What is more, one population element may have no attribute or more than one attribute. The proposed model may be treated as the model assuming random overlapping domains. We present the problem of prediction of a domain total (or being more precise – total value for element of population with some attributes) based on the general linear mixed model (GLMM). Different model (assuming inter alia that one population element may belong at random only to one of domains) was considered by Żądło (2006). The main aim of this paper is to present the equation of the best linear unbiased predictor (BLUP) and its mean squared error (MSE) under the proposed model. Additionally the problem of estimation of model parameters will be studied and its influence on the predictor's accuracy will be considered in the simulation study.

ESTIMATION METHOD FOR QUANTILE REGRESSION

Abstract

In this paper the estimation of linear quantile regression model is presented. That kind of model can be used for modelling conditional VaR using only the pertinent information that determines quantiles of interest. Moreover, both the classical quantile regression models and nonparametric estimation approaches are shown.

SENSITIVITY ANALYSIS OF SOME ROBUST ESTIMATORS OF VOLATILITY

Abstract

Leptokurtotic tails of data distributions and contamination of data with outliers in financial time series are the reasons for adapting robust methods to constructing effective investment portfolios. In this paper we present the sensitivity analysis of selected robust estimators of volatility and the classification of generated investment portfolios with respect to chosen robust estimators.

QUANTILES RATIO RISK MEASURE FOR STABLE DISTRIBUTIONS MODELS IN FINANCE

Abstract

This article presents some quantile risk ratio measures based on unclassical VaR approach (expected and median shortfall). The stable distributed log-returns of Polish indexes WIG and WIG20 are used. The results shows clear lead of stable distribution over the normal one (especially in terms of VaR calculation).

VECTOR AUTOREGRESSIVE MODELS ON THE POLISH ELECTRIC ENERGY MARKET

Abstract

In this article the relation between three whole-day markets from Polish electric energy market was presented. Vector Autoregressive models of prices and volumes of electric energy from the Day Ahead Market (DAM), the Internet Electricity Trading Platform (IETP), and Balance Market (BM) were applied to describe similarities and dependence between them.

ON THE METHOD OF DETECTION LINEAR TREND IN STOCHASTIC PROCESSES

Abstract

Various physical, technical, biological, and economic processes can be modelled using stochastic processes. A physical example of a stochastic process is the brownian motion and an economic examples are production processes. The method of modelling stochastic processes are widely used in analysis of properties of statistical quality control procedures. One of the most common problems in monitoring real processes in quality control is to test the stability of the process. The methods for detecting the trend in stochastic processes are presented in the paper. There are three methods analyzed which are based on the average indexes. Two cases of non stationary processes were analyzed: one step shift and linear trend. The Monte Carlo study have been made. The results of the simulation study have shown that the proposed test can be used to verify the hypothesis about the stability of stochastic process.

USING BAGGING AGGREGATION METHOD IN TAXONOMY

Abstract

Ensemble approach based on aggregated models has been successfully applied in the context of supervised learning in order to increase the accuracy and stability of classification. Recently, analogous techniques for cluster analysis have been suggested. Research has proved that, by combining a set of different clusterings, an improved solution can be obtained.

In the literature a resampling method, inspired from bagging in classification, was proposed to improve the accuracy and stability of clustering procedures. In the ensemble method, a partitioning clustering method is applied to bootstrap learning sets and the resulting different partitions are combined by majority voting. Similarly as in prediction, the motivation behind bagging is to reduce variability in the partitioning results via averaging. The performance of the new and existing methods were compared using real and artificial data sets. Generally the bagged clustering procedure was at least as accurate and often even much more accurate than a single application of the partitioning clustering method.