INTRODUCTION

We present the latest issue of „Folia Oeconomica" devoted to methods of multivariate statistical analysis and their applications. Most of papers included in this volume were the subject of discussions of the 25th Conference on Mathematical Statistics and the 18th Conference on Multivariate Statistical Analysis, which were held on 6–10 December, 1999.

The conferences were organised by:

– Committee for Mathematics, Polish Academy of Sciences,

– Faculty of Mathematics and Computer Studies, Adam Mickiewicz University, Poznań,

– Chair of Mathematical and Statistical Methods, Academy of Agriculture, Poznań,

– Institute of Econometrics and Statistics, University of Łódź,

– Polish Statistical Association.

All the articles have been arranged into the following thematic groups:

I. Testing of statistical hypotheses, linear models.

II. Selected problems of representative method.

III. Non-standard statistical methods.

IV. Applications of statistical methods in economy and ecology.

The author of the first paper entitled *Homoscedasticity tests for the linear trend* analyses properties of statistical tests used for verifying the hypothesis on homoscedasticity of random component. In particular, power of two Goldfeld-Quandt tests was assessed and compared with the F test. Analysis of tests' power was conducted with the use of numerical methods and on the basis of a large number of Monte Carlo experiments referring to the linear trend model.

In the paper *Multivariate biassay in a two-way estimation of heterogeneity design* the author considers the problem of testability of hypotheses about parallelism and relative potency of the preparations and proves that these hypotheses for the considered experiments are testable.

In paper *Bayesian and Akaike's information criterions for some multivariate tests of homogeneity with applications in multisampling clustering* the author presents properties of test of homogeneity based on Akaike's criterion and

Bayesian criterion. These tests are used for choosing models which best describe experimental data and are competitive in comparison with traditional tests verifying the hypothesis on homogeneity of averages and covariance matrix in multivariate linear models.

The paper entitled *The recursive least squares estimation of parametric functions in the general linear model* is an attempt to apply the recursive least squares method for the general linear model in which singular dispersion matrix of error term is allowed. The author shows the way of updating estimates of vector of parametric functions based on additional sample data which are successively introduced to inference process.

In the next paper *Testing multivariate normality by data transformations* the authors make a comparison between selected transformations of multivariate samples and univariate samples, and then verify the hypothesis on normality with the use of 18 tests whose properties were analysed. Different combinations of transformations with tests on univariate normality were considered what allowed to form conclusions referring to this kind of procedures which have practical applications in analyses of multivariate variables.

The next paper in this part *Bootstrapowy test wielokrotny* discusses sequential test procedure used for verification of the hypothesis on appropriate ordering of averages in populations. The presented method belongs to bootstrap procedures i.e. the ones in which an unknown distribution is replaced by its empirical counterpart.

Part Two presents problems from sampling theory and, in particular, from small area statistics. Paper *On stratification of population on the basis of auxiliary variable and the selected sample* is devoted to the issue of stratification of population on the basis of information on additional variable and dividing a simple sample into sub-samples from which statistics are determined and used for estimation of average value of population. The author proves that the estimator constructed in such a way is unbiased and derives a formula for estimator variance and makes on attempt to generalise this type of estimator.

In the next paper *Analiza rozkładów wybranych estymatorów w statystyce małych obszarów* the authors analyse properties of four estimators of global values for a small area in case of stratum sampling and stratification after sampling. The results obtained on the basis of experiments show high effectiveness of the considered estimators.

Part Three presents problems which go beyond classical mathematical statistics and which have been called here non-standard statistical methods. In the article *Wybrane metody analizy cenzurowanych czasów zdatności* the author presents methods of data analysis which refer to censored lifetimes of products. He discusses in detail the table of lifetimes, parametric

methods, non-parametric Kaplan-Meier method of estimation and regression methods.

The paper entitled *A simulation study of two-sample Kolmogorov-Smirnov test in randomly censored data* contains properties of Kolmogorov-Smirnov test which verifies hypothesis on identity of distributions of random variables on the basis of censored data. The author conducted a series of simulation experiments concerning the power of three versions of the discussed test.

In the paper *Detecting sharp contours of images* the author presents an overview of methods of detecting peaks of Wang function and his own proposition of algorithm for detecting sharp contours of images.

The following paper in this part – *Analityczny proces hierarchii jako metoda rozwiązywania problemów decyzyjnych* – presents analytical process and points out its advantages and limitations.

Part Four deals with applications of selected statistical methods in economy and ecology. In the paper entitled *Wpływ wybranych czynników na wielkość i zróżnicowanie indeksów cen towarów i usług konsumpcyjnych* the author makes an analysis of selected factors: income, socio-economic groups of households and town size on dynamics of costs of living of households in Poland in the 80-ties and 90-ties.

The paper *Analiza maksymalnych poziomów stężeń zanieczyszczeń dla Górnego Śląska* contains an illustration of practical application of regression model for assessment of pollution concentration, monitoring and forecasting.

In the paper *Wykorzystanie algorytmu genetycznego do klasyfikacji przedsiębiorstw* authors present the algorithm which is the basis for classification of firms applying for a bank credit. In particular, an appropriate neural network was presented which was „trained" with the use of one of genetic algorithms.

The paper entitled *Dychotomiczna klasyfikacja kredytobiorców przy użyciu wielowymiarowej analizy dyskryminacyjnej* contains a proposition of application of multivariate discriminant analysis. The authors present in detail a procedure which enables to classify bank customers with the use of linear and square discriminant function.

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