

INTRODUCTION

The articles we would like to present are the result of the 29th Conference on Multivariate Statistical Analysis – MSA 2010. The conference was organised by the Chair of Statistical Methods of the University of Łódź in cooperation with the Polish Statistical Association and the Committee on Statistics and Econometrics of the Polish Academy of Sciences. It was held on November 8–10, 2010, in the Conference Centre of the University of Łódź. The range of subjects of the Conference papers was fairly wide, from the theory of probability, through statistical methods to their applications in various disciplines.

Some of the papers presented at the Conference are included in this volume.

The papers are divided into three thematic groups:

I Polish Statisticians

II Statistical Methods

III Applications

Section I is devoted to Polish statistics. This section includes the following articles: Czesław Domański – *Kazimierz Władysław Kumaniecki – a statistician the founder of Polish Statistical Society*, Mirosław Krzyśko – *Professor Marek Fisz (1910–1963). On the centenary of his birth*, Janusz Wywiół – *Selected scientific works of Zbigniew Pawłowski on the occasion of the 80th anniversary of his birthday*, Bronisław Ceranka – *Professor Wiktor Oktaba 1920–2009*, Milda Maria Burzała – *Posthumous tribute to Professor Bogusław Guzik (1946–2009)*.

The second group included articles with statistical methods. Some of them are illustrated with examples.

Czesław Domański (*Statistical tests based on empty cells*) considered David-Hellwig test and a two-sample consistency test. Empirical power of the tests is presented in comparison to classic tests: Kolmogorov and Shapiro-Wilk test for testing normality of a distribution and t-Student's and Wilcoxon tests for testing consistency of two distributions.

Grażyna Trzpiot (*Some properties of the robust trend tests*) presented the properties of behavior of the robust (to the order of integration of the data) trend tests of Bunzel and Vogelsang (2005), Harvey et al. (2007) and Perron and Yabu (2009). These tests are termed 'robust' in the sense that the asymptotic critical values for testing hypotheses on the trend coefficient.

Grzegorz Kończak (*On testing the significance of the coefficients in the multiple regression analysis*) considered a permutation test for testing the significance of the coefficients in the regression analysis. Permutation tests can be used even if the normality assumption is not fulfilled. The properties of this test were analyzed in the Monte Carlo study.

Jacek Stelmach (*Using permutation tests in multiple correlation investigation*) presented a possibility and advantages of permutation tests for correlation coefficient with the discussion about proposed test statistics. The power of proposed tests was estimated on the basis of Monte Carlo experiments. The investigations were carried out for real data – a sample of refinery process parameters

Joanna Tomanek (*Tests of multivariate independence based on copula*) presented the tests of multivariate independence based on the empirical copula and the Möbius transform. The article presents the copula function and the empirical copula, the multivariate independence tests and gives the empirical example.

Bronisław Ceranka and Małgorzata Graczyk (*Notes on the optimum chemical balance weighing design*) discussed the model of the chemical balance weighing design, i.e. model in that the result of experiment can be described as linear function of unknown measurements of objects with known factors. They presented the existence conditions setting the optimum design and new construction method of the matrix determining the conditions of the experiment.

Małgorzata Graczyk (*Some construction of regular A-optimal spring balance weighing designs for even number of objects*) discussed the problem of construction of the spring balance weighing designs satisfying the criterion of A-optimality.

Wojciech Gamrot (*On generating correlated pseudo-random binary numbers*) described the problem of generating sequences of binary vectors having joint distribution allowing for correlation between individual elements. He proposed a procedure for generating such a distribution from uncorrelated binary and multinomial pseudo-random data.

Justyna Brzezińska (*Hierarchical log-linear models for contingency tables*) presented log-linear analysis for contingency tables.

Małgorzata Misztal (*Imputation of missing data using R package*) described selected imputation techniques. Special attention is paid to methods implemented in some packages working in the R environment.

Dorota Rozmus (*Comparison of stability of classical taxonomy bagging method with bagging based on co-occurrence data*) presented an experimental study to compare stability of bagging method used to the classical data set with bagging based on co-occurrence matrix.

Tomasz Żądło (*On pseudo-EBLUP under some model for longitudinal data with auxiliary variables*) considered the problem of modeling longitudinal profiles assuming that the population and elements affiliation to subpopulations

may change in time. The considerations are based on a model with auxiliary variables for longitudinal data with element and subpopulation specific random components.

Next section is devoted to the applications of statistical methods.

Dorota Bartosińska (*Statistical inference from complex sample with SAS on the example of household budget surveys*) presented utility of SAS software to statistical inference from complex sample. Data from Household Budget Survey 2008 were used in examples.

Jacek Białek (*Special cases of some general formula for price indices*) presented a general formula for aggregative price indices that satisfies most postulates coming from the axiomatic price index theory. Author showed that a lot of known and useful price indices are particular cases of the discussed formula.

Piotr Białowolski (*Applicability of the multi-group confirmatory factor analysis to construction of business sentiment indicators*) presented arguments that advocate for application of the multi-group confirmatory factor analysis as a tool for constructing sentiment indicators in business surveys. It is hypothesized that only sets of questions that are internally coherent can serve as a group of proxies for business sentiment indicator.

Wioletta Grzenda (*Bayesian exponential survival model in the analysis of unemployment duration determinants*) presented demographic and socio-economic factors influencing the unemployment duration in the recent period in Poland. The empirical analysis is based on “Household budgets in 2008” survey of Central Statistical Office and indicates the main factors influencing unemployment duration.

Aneta Rybicka and Marcin Pełka (*Evaluation of college students with application of latent class analysis*) presented evaluation of college students with application of latent class analysis. To obtain such a goal data collected (winter recruitment of 2008/2009) by a college in Walbrzych was used. The latent class analysis allows to reveal hidden relations between observable variables.

Czesław Domański
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