

EDITOR'S NOTE AND ACKNOWLEDGEMENTS

As the last issue of the 2014, this volume gives us an opportunity to thank all the journal's collaborators and supporters. On behalf of the Editorial Board and the whole Editorial Office, I would like to express our gratefulness to the authors of articles published during the past year, and to acknowledge generous help which both the authors and editors obtained from the peer-reviewers. The names of the reviewers are listed in the Acknowledgements to Reviewers, below.

Two types of innovations mark this issue as an attempt to advance further our cooperation with authors and readers alike. The first one is addition of the *Early View* system for online printing of the articles which are still being under editorial processing though might give authors opportunity to improve them while viewing them in the printed format. The second is continuation of tentatively included into the previous issue of the section containing biographical notes about the authors, with information on their main fields of research interest and expertise. These both innovations are supposed to contribute to the journal's visibility and accessibility which are also enhanced by our continued efforts to have the journal included into the growing set of prestigious indexation bases – such as BazEkon (we still expect confirmation from SCOPUS, RePEc, and so on).

An overview of the contents of this issue embraces three groups of articles. In addition to traditional section devoted to *Sampling methods and estimation*, there is a section *Research articles and communicates* which contains papers of mixed status – next to papers with completed research results it presents 'communicates' with results obtained within an early stage of a larger or still ongoing research project (the latter can also be seen as an innovation toward encouraging submission of fresh-made papers). The third section contains papers based on presentations at the Multivariate Statistical Analysis 2014, conference held in Lodz (on November, 17-19, 2014).

The issue is opened with *A General Class of Mean Estimators Using Mixture of Auxiliary Variables for Two-phase Sampling in the Presence of Non-response*, by **Zahoor Ahmad, Rahma Zubair** and **Ummara Shahid**. The authors suggest a general class of estimators for two-phase sampling to estimate the population mean in the case when non-responses occur at the first phase. Several continuous and categorical auxiliary variable(s) have been simultaneously used while constructing the class. Also, it is assumed that the information on all

auxiliary variables is not available for population, which is often the case. The expressions of the mean square error of the suggested class have been derived and several special cases of the proposed class have been identified. The empirical study has also been conducted. This paper is also aimed at filling the gap in the literature through suggesting estimation of the finite population mean using both qualitative and quantitative multi-auxiliary variables in the presence of non-response at the first phase under two-phase sampling.

Janusz L. Wywiał's article *On Conditional Simple Random Sample* addresses the issue of estimation of the population average in a finite and fixed population on the basis of the conditional simple random sampling design dependent on order statistics of the auxiliary variable studied. The sampling scheme implementing the sampling design is proposed. The inclusion probabilities are derived. The well-known Horvitz-Thompson statistic under the conditional simple random sampling designs is considered as the estimator of population mean. It has been shown that the Horvitz-Thompson estimator under some particular cases of the conditional simple random sampling design is more accurate than the ordinary mean from the simple random sample.

Marta Zalewska and **Wojciech Zieliński** discuss the problem of *Statistical Analysis of a Questionnaire: Voluntary Health Insurance Implementation Among Patients Suffering from Allergy and Asthma*. They propose to use a simultaneous confidence intervals in inference about true population proportions in situation when multiple answers in a questionnaire are allowed. A new method of calculating simultaneous confidence regions is provided. It is aimed at improving inference about the population based on such intervals. The inference about the respective population suffering from allergy and asthma proportions requires the construction of a two-dimensional confidence region. Much of authors' attention is paid to the case of three possible answers but the results may be generalized to any questionnaire with more than two excluding answers.

The next section (with research articles and communicates) starts with **Jacek Bialek's** paper *Proposition of Stochastic Postulates for Chain Indices*, which are based on the assumption that prices and quantities are stochastic processes, but the case when price processes are martingales is included too. General conditions which allow the chain indices to satisfy these postulates are discussed with intention to provide an alternative for the classic axiomatic price index theory. The novelty of the presented approach consists in treating the prices and quantities as stochastic processes, and the discussion is meant to introduce the author's future research agenda on chain index theory.

It is followed by a paper *Lag Length Specification in Engle-Granger Cointegration Test: A Modified Koyck Mean Lag Approach Based on Partial Correlation* by **Oluokun Kasali Agunloye, Dahud Kehinde Shangodoyin and Raghunath Arnab**. The authors discuss the problem of limitations of the Engle-Granger cointegration test due to its sensitivity to the choice of lag length and the poor performance of conventional lag selection criteria, such as standard information criteria. Testing for cointegration within the framework of the residual-based Engle-Granger cointegration methodology is the same as testing for the stationarity of the residual series via the augmented Dickey-Fuller test which is well known to be sensitive to the choice of lag length. The researchers are faced with the problem of deciding on the best optimal lag among the candidate optimal lag lengths. This paper introduces a new lag selection criterion called a modified Koyck mean lag approach based on partial correlation criterion for the selection of optimal lag length for the residual-based Engle-Granger cointegration test. Based on empirical findings, it has been observed that in some instances over-specification of lag length can bias the Engle-Granger cointegration test towards the rejection of a true cointegration relationship and non-rejection of a spurious cointegration relationship. Using real-life data, the authors present an empirical illustration which demonstrates that the proposed criterion outperformed the standard information criteria in selecting appropriate optimal truncation lag for the implementation of the Engle-Granger cointegration test using both augmented Dickey-Fuller and generalized least squares Dickey-Fuller tests.

Anna Turczak and Patrycja Zwiech discuss the issue of *Variability of Household Disposable Income per capita by Types of Residence in Poland*. They use micro-data for the years 1998-2012, though the analysis has been carried out separately for the subsequent years of this period. The study shows that households in Poland are differentiated with regard to income *per capita* by the classes of residence, with the differences within the groups being much bigger than the differences between the groups. What is particularly surprising is that the share of between-group variance in total variance in the population under study has been negligibly small (just a few percent) compared to the share of the mean within-group variance (more than 90 percent). In conclusion, the authors emphasize that the location of a household (city, small town or village) is also significant for the level of household disposable income *per capita*, but the differences are small in comparison to the differences between households of the same classes of residence. Consequently, the authors suggest that more appropriate way of dividing households would be the one explaining better the dispersion of household disposable income *per capita*. The authors are continuing

their analysis towards developing a new classification of households which will be adequate for the problem under study.

In the next article, *Evaluation of Selected Approaches to Clustering Categorical Variables*, **Zdeněk Šulc** and **Hana Řezanková** consider a set of different similarity measures for defining their contribution to categorical variable clustering. They use three methods of hierarchical cluster analysis (complete, single and average linkage methods) and compare results of cluster analysis using three recent similarity measures (inverse occurrence frequency, occurrence frequency and Lin measures) with results obtained on a basis of two association measures for nominal variables (Cramér's V and the uncertainty coefficient) and the simple matching coefficient (the overlap measure). The quality of clustering is evaluated by the within-cluster variability of created clusters (the lower values the better). The normalized within-cluster mutability coefficient is applied for this purpose. The calculations are made on data from two real datasets (from a social survey).

Finally, two papers from the Multivariate Statistical Analysis 2014 conference constitute the last section of this issue. **Daniel Kosiorowski** compares four methods of forecasting functional time series in the article *Functional Regression in Short-Term Prediction of Economic Time Series*. Specifically, themes discussed are fully functional regression, functional autoregression FAR(1) model, and Hyndman and Shang principal component scores forecasting using one-dimensional time series method, and moving functional median. Both simulation studies and an analysis of empirical dataset concerning the Internet users' behaviours for two Internet services in 2013 are employed. In effect, Hyndman & Shao predicting method is shown to outperform other methods in the case of stationary functional time series without outliers. Similarly, the moving functional median induced by Frainman & Muniz depth for functional data outperforms other methods in the case of smooth departures from stationarity of the time series, as well as in the case of functional time series containing outliers.

Marta Malecka's paper *Duration-Based Approach to VaR Independence Backtesting* discusses the problem of low power of the VaR-based risk valuation models in investment companies. The problem becomes a particularly serious one in the case of finite-sample settings. A dynamic development in the area of VaR estimation and gradual implementation stimulate the need for statistical methods of VaR models evaluation. Following recent changes in Basel Accords, current UE banking supervisory regulations require internal VaR model backtesting, which gives another strong incentive for research on relevant statistical tests. An alternative to the popular Markov test is sought and the author presents an

overview of the group of duration-based VaR backtesting procedures along with their statistical properties, rejecting a non-realistic assumption of the infinite sample size. The Monte Carlo test technique has been adopted to provide exact tests, in which asymptotic distributions has been replaced with simulated finite sample distributions. A Monte Carlo study (based on the GARCH model) has been designed to investigate the size and the power of the tests. Through the comparative analysis it has been found that, in the light of observed statistical properties, the duration-based approach has been superior to the Markov test.

Włodzimierz Okrasa

Editor

ACKNOWLEDGEMENTS TO REVIEWERS

The Editor and Editorial Board wish to thank the following persons who served from 31 December 2013 to 31 December 2014 as peer-reviewers of manuscripts for the *Statistics in Transition new series* – Volume 15, Numbers 1–4; the authors' work has benefited from their feedback.

Abuzinadah Hanaa, King Abdulaziz University, Jeddah, Saudi Arabia

Al-Omari Amer Ibrahim, Al al-Bayt University, Mafraq, Jordan

Andersson Per Gösta, Örebro University, Sweden

Baszczyńska Aleksandra, University of Lodz, Poland

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Biecek Przemysław, University of Warsaw, Poland

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