

## FROM THE EDITOR

The *sampling methods and estimation* section, which traditionally opens each of the journal's issue, contains just one article: ***Developing single-acceptance sampling plans based on a truncated lifetime test for an Ishita distribution*** by **Amjad D. Al-Nasser, Amer I. Al-Omari, Ahmed Bani-Mustafa, Khalifa Jaber**. The acceptance sampling plans encompass statistical procedures that are used for quality control and improvement in situation when it is not possible to test every item in a lot of materials. In this type of procedures, an important characteristic of the materials is their lifetime sampling distribution, which can vary from sample to sample. Authors propose to use a new lifetime distribution, known as an Ishita distribution, for developing a new single-acceptance sampling plan, which is developed under a condition wherein the mean lifetime test is truncated within a pre-specified time period. The parameters of the acceptance sampling plan including the operating characteristics function and the minimum sample size are obtained. The producer's risk in relation to the entire lot of materials is derived and illustrated by numerical examples. The consumers and producers are advised to adopt this plan in order to save time and minimize the production process cost.

A set of four papers in *research articles* starts with **Laxmi Kant Dwivedi's** article ***The role of breastfeeding vis-à-vis contraceptive use on birth spacing in India: a regional analysis***. Since birth spacing is one of the important aspects of reproductive health, it is studied from time to time in view of the epidemiological transition taking place worldwide. Using the third round of National Family Health Survey-3 data, the central hypothesis of this paper stresses the relative advantages of breastfeeding over other methods of contraception among non-sterilized women. A simulative approach of the Cox regression analysis for India and its regions has been used to verify such expectations. The results show that if women were not having amenorrhea period and had a high level of breastfeeding, the chance of not having next live birth was only two percent lower than those of women who were using spacing methods in India. An effort has also been made to apprise the policymakers of the interrelation between breastfeeding, postpartum amenorrhea, contraceptive use and birth spacing. Nonetheless, policymakers should promote programs that encourage both breastfeeding and contraceptive use. Breastfeeding has direct benefits for infant health in addition to its role in lengthening birth intervals beyond postpartum amenorrhea.

In the paper ***Dealing with heteroskedasticity within the modelling of the quality of life of older people***, **Katarzyna Jabłońska** demonstrates that using the estimation method of ordinary least squares leads to unreliable results in the case of heteroskedastic linear regression model. Alternative methods – including weighted least squares, division of the sample and heteroskedasticity-consistent covariance matrix estimators – can give estimators with better properties than ordinary least squares. The data come from the first wave of the COURAGE –

Poland study. The comparison of estimators and their practical application may provide interesting example of searching for the most appropriate estimation tool after detection of heteroscedasticity. Due to growing availability of techniques and access to more precise tools, it seems advisable to use HC-estimators in the occurrence of heteroskedasticity to verify the significance of model parameters, and to analyse them in depth.

**Anna Majdzińska's** paper, *Spatial measures of development in evaluating the demographic potential of Polish counties* presents a demographic potential-based typology of Polish counties. The typology was created using the spatial measures of development (available in the literature and proposed by the author) applied to Statistics Poland's data. The major information related to such features as age structure and changes in the natural movement of the population, and migrations in counties in the years 2005 and 2016.

The next paper, *Another look at the stationarity of inflation rates in OECD countries: application of structural break-GARCH-based unit root test* by **OlaOluwa Simon Yaya** discusses the unit root hypotheses of inflation rates in 21 OECD countries using the newly proposed GARCH-based unit root tests with structural break and trend specifications. The results show that classical tests over-accept unit roots in inflation rates, whereas these tests are not robust to heteroscedasticity. As it is observed from the pre-tests, those tests with structural break reject more null hypotheses of unit roots of most inflation series than those without structural breaks. By applying variants of GARCH-based unit root tests, which include those with structural breaks and time trend regression specifications, it was found that unit root tests without time trend give most rejections of the conventional unit roots. Batteries of unit root tests for discriminating between stationarity and nonstationarity of inflation rates are recommended, since in the case of over-differenced series, wrong policy decision will be made, particularly when inflation series is considered in a cointegrating relationship with other variables.

The *other articles* section includes a paper based on the presentation at the Multivariate Statistical Analysis Conference in Łódź (2016), *Discriminant coordinates analysis in the case of multivariate repeated data* by **Miroslaw Krzyśko, Wojciech Łukaszonk, and Waldemar Wołyński**. The paper presents an innovative approach to analysis of multivariate repeated measures data using the classical discriminant coordinates. The proposed solution is based on the relationship between the discriminant coordinates and canonical variables. The quality of these new discriminant coordinates is examined on real data.

The next section, *research communicates and letters*, contains three papers. It starts with **Faizan Danish's** paper *A mathematical programming approach for obtaining optimum strata boundaries using two auxiliary variables under proportional allocation*. The paper commences with an observation that optimum stratification – the method of choosing the best boundaries that make the strata internally homogenous – is often attempted when a study variable is itself a stratification variable. However, in many practical situations fetching information regarding the study variable is either difficult or sometimes not available. Using auxiliary information many authors are redefining the problem as the problem of optimum strata width, and developed a solution procedure using

dynamic programming technique. In this paper, under proportional allocation optimum stratification boundaries are determined for the study variable using two auxiliary variables as the basis of stratification with uniform, right-triangular, exponential and lognormal frequency distribution by formulating the problems which are executed by using dynamic programming. Empirical studies are presented to illustrate the computation details of the solution procedure and its comparison with the existing literature. The empirical studies suggest that the proposed method is more preferable than the existing methods.

In the next paper, ***Comparison of diabetic nephropathy onset time of two groups with left truncated and right censored data***, Alka Sabharwal and Gurprit Grover present a comparison of the nephropathy onset time of type-2 diabetic patients, grouped on the basis of gender and age at the time of diabetes diagnosis. Diabetic Nephropathy (DN) onset time is assumed to follow Weibull distribution with fixed left truncation. The likelihood ratio test is applied on uncensored cases and Thoman and Bain two sample tests are applied with generated left truncated Weibull distributions. To avoid the model validity issues for left truncated and right censored data (LTRC), the nonparametric approach, suggested by Kaplan and Meier, is used to compare the survival function of two groups over different time periods. Another method based on median survival time of the pooled group is applied to compare the survival function of two groups with LTRC data. The major advantage of developing methods for comparing the nephropathy onset times of DM patients is that the expected DN onset time of new DM patients can be predicted depending on the patient group.

Milena Bieniek's paper, ***Channel performance under Vendor Managed Consignment Inventory Contract with additive stochastic demand*** is devoted to the so-called consignment as the shifting of the inventory ownership to a supplier in virtual market. In this form of business arrangement the supplier places goods at a retailer's location without receiving payment, until the goods are sold. The author considers a single period supply chain model, where the supplier contracts with the retailer with some probability of return. Market demand is additive, linearly price-dependent and uncertain. Focus is on vendor managed consignment inventory (VMCI) channel, in which the supplier decides the consignment price and his service level and the retailer chooses the retail price. Also, a channel performance under VMCI setting is studied by analysing how the model parameters influence decision quantities, channel profit and risk function. The obtained results are illustrated by a numerical example.

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