INTRODUCTION

The geographical space is formatting and is an effect of many different phenomena. The collection of methods contains spatial analysis tools for the description, inference and research relations between objects in geographic space. Methods of spatial analysis allow quantify and descript trends and spatial distribution of economic, social or environmental processes, characterized by high complexity of directly unobservable factors.

The importance of the economic processes in the literature is examined in two ways. According to the first approach, the location of regions or economic entities is considered as one of the determinants of development processes. As used in this context, quantitative methods allow for analysis of distribution characteristics and relationships between entities located in space. The main theoretical concepts, form part of these assumptions include, among others, core-periphery as well as geographical pension's theory.

The second approach assumes that space and locations are liable to change and are formed according to the needs and capabilities of the units. These assumptions are consistent with the concept of Weber's industrial location and Chrystaller's central locations. The approach identifies areas of potential empirical studies and enforces appropriate application methods and spatial analysis models. The development of geographical information systems, both in terms of data availability, computational methods, let to stimulate dissemination of empirical studies using spatial analysis methods in decision-making and evaluation of development policies at local and global levels. Very important for the development of spatial data analysis methods and their applicability is an opportunity to present the research achievements and to share experiences.

In this edition of the Folia Oeconomica, we publish 13 scientific papers. The first part of issue presents the results of studies on spatial econometrics methods and models. Professor Jean H. P. Paelinck in the article *Some challenges for spatial econometricians* discusses five principles that should guide spatial econometric modeling. Paper takes up some challenges derived from recent research on estimation, identification, multiple regimes, non-convexities, spatial bias and specification. Professor Janusz L. Wywiał in paper *On space sampling designs* reviews of the sampling designs used to draw samples from spatial populations is presented. Especially, the complex sampling designs dependent on auxiliary variables are considered. The study *Assessing the space-time structure with a multidimensional perspective* (Alicja Olejnik, Ph.D) presents some remarks on procedure for space-time process investigation by the use of multidimensional panel spatial autoregressive model. It is shown that information on the strength and significance of the spatial interactions is given by the model.

Edyta Łaszkiewicz, M.A. in article *Spatial aspects in the multilevel models construction* presents the possibility of spatial processes analyses using multilevel models. The implementation techniques of the already existing multilevel models to the spatial structure are discussed. Additionally, the possibility of the traditional multilevel models rebuilding, towards taking into account spatial interactions, is presented.

Second part of issue contains papers, which empirical researches are focused on spatio-temporal analysis of chosen markets. The article *Econometric evaluation of risk at shanghai stock exchange* (Professor Magdalena Osińska, Marcin Fałdziński, M.A., Tomasz Zdanowicz M.A.) rises the problem of segmentation of the Chinese financial market. Authors take into account the process of transferring risk between major indices of Shanghai Stock Exchange and sector indices (sub-indices) representing various segments of the market. To check proposed hypotheses we applied Granger causality in risk concept. They apply different risk measures to take into consideration different risk patterns (small, medium and high risk generated locally and/or globally). Barbara, PhD, Batóg, Iwona Foryś PhD, in article *The analysis of the spatial stability of prices on the secondary housing market* analyze the transaction prices of apartments on the local secondary housing market. In the article Authors verified the research hypothesis that prices on the secondary housing market are stable in time in given location.

The third part contains articles on spatio-temporal modeling of social economic and environmental development. The aim of research *Spatial microsimulation analysis of proportion of out-of-pocket pharmaceutical expenditures in household income in Poland in the years 2010–2018* (Agata Żółtaszek, PhD) is to apply a microsimulation to analyze the proportion of direct pharmaceutical expenditures in household income in Poland in the years 2010–2018. The results are used to perform a spatial analysis over provinces in Poland. The study *Analysis of multidimensional temporal and spatial data based on the example of employment in health care in selected voivodeships of Poland* (Danuta Rozpędowska-Matraszek, PhD) aims to present results of the analysis of multidimensional spatial and temporal data used in evaluating structural and geographical changes in the employment of medical specialist after health care restructuring carried out from 1999 to 2010. In paper *Degradation of air and quality of life – spatial panel analysis* (Elżbieta Antczak, PhD) Author identifies and analyzes a correlation between excessive air pollution, well-being and the cost of living. The analysis is performed using spatial panel models. Renata Jaworska M.A. in article *Application of mimic model to construction of environmental pressure index* estimates the environmental pressure index and provide a ranking for selected European countries with the use of a Multiple Indicators Multiple Causes (MIMIC) model. The MIMIC model is a special form of Structural Equation Modeling able to estimate models with latent variables. The purpose of paper *Evaluation of rural development processes in Lublin region using similarity measures*

(Danuta Guzal-Dec, PhD, Magdalena Zwolińska-Ligaj, PhD) is to present the results of the analysis of rural development processes in the Lublin region for the occurrence of convergence or divergence of development based on similarity measures formulated by I. Kudrycka. Maciej Beręsewicz, M.A., in paper *PLS Regression using spatial weights on the example of spatial modeling support for political parties in elections 2011 to the Sejm of The Republic of Poland* analyzes factors influencing the results of the political party in a particular spatial or administrative unit. Author assess SPLSR model with known spatial linear models with spatial lag and error to compare fit, information criteria and errors. The aim of paper *Analysis of spatial concentration of the Regional Operational Programmes funds support use* (Emilia Modranka M.A), is to analyze the spatial concentration and structure of intervention funded form Regional Operational Programmes. The research was based on data about the state of implementation of European funds in the poviats (NUTS 4) in 2007–2010, generated from the National Information System SIMIK 07–13.

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