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Summaries

Anna Avdiushchenko, Arnold Korkhin

Company's economic condition improvement using indicators' rank estimation

The article is dedicated to an economic condition estimation of a company based on a rank correlation coefficient as the most suitable method using only one aggregative estimating criterion. A company's indicators' volume management can be based on this estimation and it is applicable to different market branches. The research indicates a possibility to using this method in practice.

Elżbieta Babula, Anna Blajer-Gołębiewska

Shareholders' decisions modelling under asymmetric information

Inside ownership and outside ownership should be seen as two distinct groups which interests conflict. There is a significant difference between them according to access to information about the company. The article investigates how the decisions of shareholders differ in the presence of asymmetric information. Thus, the main aim of this article is to determine proxies for the level of asymmetric information and to discuss and compare models and methods based on those proxies. The main paper's thesis is that setting appropriate proxies enables analysts to determine the level of asymmetric information and the way it influences decision making process.

Stanisława Bartosiewicz

Dynamics and space of employment structure in Poland

The article presents verification of two theses: 1) the dynamics of employment percentage in services in Poland should show growth of their value, 2) the dynamics by voivodship in Poland regarding employment structure differentiation should fall down.

The verification of the first thesis is satisfactory, the article shows procedures how to adapt the rate of employment percentage growth in Poland to some European countries with higher development rate than Poland (Denmark, Holland, United Kingdom). The verification of the second thesis can temporarily evoke some doubt, because time-series of data are too short.

Anna Błaczkowska

Analysis of financial condition and hierarchy of needs of households in Poland in 2001-2007

The aim of this study was to verify if the wealth of Polish households increases, which is expressed as an increase in the available income and a decrease in the expenditures on food in the total expenditures of the households. The aim was to verify if, as the years went by, higher order needs were becoming basic needs. An answer to the first question is basically positive – Polish households are getting wealthier year by year, although the growth rate of wealth differs depending on a type of a household.

It is impossible to give a clear answer to the second question, because in the studied years there was no clear transformation of higher order needs into the basic ones, but the elasticity of expenditure to satisfy the needs is characterized by a downward trend, which may indicate a forthcoming change.

In the paper an attempt was made to modify the classical approach of Bowley's linear model of needs and its use in combination with the Kendall's correlation coefficient to analyze the stability of household expenditures in terms of hierarchy of needs.

Marcin Błażejowski

Producer's price discount policy – econometric analysis

The article presents a statistic and econometric price discount policy of one of the Polish breweries. The analysis will be based on the data for the individual beer purchase, considering reports on the type of product, price discount given, distribution channel, region, market segment, quantity ordered, etc. The author also tries to identify the price discount policy applied by the producer.

Małgorzata Borzyszkowska

**Analysis of the macroeconomic variables integration in the Polish economy
in years 1996-2009**

The article aims to compare the obtained results of three different methods of study on the integration of selected macroeconomic variables of the Polish economy in the years 1996-2009. These variables are used to build models of the demand for money for the Polish economy. The analysis was performed on the basis of the following unit root tests: Elliot, Rottenberg and Stock test (DF-GLS), Phillips-Perron test (P-P) and Kwiatkowski, Phillips, Schmidt and Shin test (KPSS). The analysis showed that the test series are non-stationary, first-order integrated and confirmed earlier findings obtained using the extended Dickey-Fuller test (ADF). To complement these results, further analysis for the presence of fractional order of integration should be carried out.

Maria Cieślak

Acceptance of highly educated persons by labour markets in the OECD countries

My research indicates the occurrence of significant benefits due to higher education in almost all countries under study with respect to wages, unemployment rate and share of highly educated employees versus those with secondary education.

Some significant, negative relationships have been found between relative wages of highly educated employees with the resources of highly educated personnel and with resources of highly educated women, whereas no links with the general unemployment rate, the Gini coefficient, and other economic variables have been confirmed.

The lack of a common strategy to promote highly skilled personnel has been revealed in countries under study. However, some countries do consistently promote their highly educated personnel apparently aiming at profitable social and economic outcomes of that strategy – those are most notably Hungary and Slovenia.

Mirosław Dytczak, Grzegorz Ginda

Linear programming with intangibles

Contemporary decision problems in spatial economy, public utilities and civil engineering are complex and multi-dimensional. This is due to influence of numerous conflicting interests and presence of intangible factors. Thus, application of appropriate tools is required for preparation of effective quantitative decisions. A survey of such approaches

is presented in the paper. Special attention is drawn to different favors of linear programming-based methods. Both well-established approaches (Fuzzy LP and Possibilistic LP) and less popular (Relative PL) are discussed. A way of intangibility modelling, supported cases of problems and methods applied for their solution are included for each approach presented.

Wiktor Ejsmont

Efficiency of Polish language teaching in secondary schools in Wroclaw

The article focuses on measuring the effectiveness of education of the Polish language in secondary schools in Wroclaw. In the first part of the article the author appropriately converts the data and explains the construction of models Aitkins and Longford. In the second part of article he applies those data to the proper models and draws conclusions from the results obtained.

Agata Falęcka, Artur Strzelczyk

The causes, consequences and scale of financial exclusion

The subject of this article is a problem of financial exclusion. The paper describes two of its main dimensions - banking and insurance exclusion. Within these two types some additional levels were identified (lack of service, marginal access to the services and full availability of the services). The authors also identify groups at risk of financial exclusion and describe the most likely reasons for this phenomenon, its consequences and ways of leveling. An important point of this study is to present the level of financial exclusion in Poland and other European Union member states.

Maria Forlicz

Subjective probability and subjective discount rates

Discounting in time should be exponential, but according to many scientists it isn't. One of possible explanations of this fact is that discounting process is influenced by subjective probability. To check this hypothesis a survey was conducted. It turns out that in more than 50% of objects there is significant correlation (for ?=0,1) between discount rates and subjective probability.

Rafał M. Jakubowski, Paweł Kuśmierczyk

Inclination to free ride as a function of expectations and adjustments of economic agents – experimental studies

Paper describes the results of experiments investigating the phenomenon of free riding (taking advantage of public goods without contributing sufficiently to their creation). The results show that an important factor influencing the tendency to free riding are the expectations for behavior of other entities that use the public good and the desire to fit into the socially accepted rules. A mathematical model presented in the paper shows that such adjustments take place in both directions: the economic agents, whose level of contribution was above the average, started lowering their contributions, whereas the agents, whose contributions were below the average, started increasing them. However as the downward adjustments are much stronger, the average level of contributions keeps decreasing with time.

Anna Jędrzychowska

New standards of evaluation indicators of Polish insurance companies

Many of analysis and evaluation of insurance companies are often based on ratio analysis. It is fast and efficient way to control the situation of an insurance company. Ratio analysis allows to assess the past and present situation of a company and may be the basis of its future position prediction. In the period 2000-2002 PUNU (a state insurance supervision office) created an evaluation indicator based on an early warning system for the Polish insurers. One of the elements of this analysis was to determine new valuations for the various values of the studied indices with the appointment of positional statistics (based on financial data for the years 1996-2000). Scales have been adjusted to nominant, stimulant and destimulant - three main indicators. For each indicator type an appropriate order statistics based limit is prepared. The article presents a proposal of new value of these crucial for insurance companies ratios.

A.S. Korkhin

Modelling of nonstationary distributed lag as applied to investment process

A lag model binding investments to putting into operation permanent assets is described. The coefficients of model change in time. Their estimations are the solution of two-criterion task of the optimization.

Paweł Kufel

Forecast errors as model quality measurement – simulation analysis

This paper refers to comparison of different model types to describe non-linear relationships.

Forecast errors (RMSE – root mean square error, MAPE – mean absolute percentage error and Theil coefficient) are used to compare and assess the quality of presented models. Simulation analysis was applied.

Tadeusz Kufel

**Econometric modelling of the seasonality of business processes
based on weekly data**

Econometric modelling of periodicity based on weekly data can only relate to the annual cycles. Modelling the annual cycle of weekly data using a set of 52 periodic 0-1 variables causes undesirable time movement for the long series of data (more than 5-6 years) because of simplification of year calculation to 364 days (52 weeks × 7 days = 364 days). This time movement can be avoided using a set of 53 periodic 0-1 variables. Numbering of week should be done according to ISO 8601:1998 (PN-EN 28601:2004) standard, i.e. the European standard. Moreover, the set of periodic variables can be supported by 0-1 variables for movable feasts, which can have a significant effect on the analyzed process.

Łukasz Kuźmiński

**An application of the annealing algorithm for assigning the G – optimal design
in a class of designs with limited costs**

In this paper application of the annealing algorithm for assigning the G – optimal design in presented. In this algorithm we additionally cover the cost condition. We assume that we have the limited outlays for making experiment. The limited outlay equals c_0. We show the case in which the total cost of experiment depends on the number of observations (n) and allocation of points in the experimental area, in which the observations are done.

The total cost of experiment P_n, in this case, is the sum of costs $c(\mathbf{x}_i)$ (where $i = 1, ..., n$) of the individual observations $C(P_n) = \sum_{i=1}^{n} c(\mathbf{x}_i)$.

In the article application of annealing algorithm for the assigning the G – optimal design by the condition in form $\sum_{i=1}^{n} c(\mathbf{x}_i) \leq c_0$ is shown. In example, the G – optimal design is assigned to the estimation of parameters of linear regression function in form

$$Y(x) = \theta_0 + \theta_1 x + \varepsilon(x).$$

Wiesław Łuczyński

An attempt to the efficiency of the WIG and DJA stock indices forecasting assessment using artificial neural networks

Rescaled range analysis allows to indicate the long-term memory cycles of the daily prices quotation of the WIG (212 observations) and of the DJA (94 observations) for 1991/04/16 – 2009/08/31 period. The WIG index quotations are described as the persistence system with a tendency to repeat the current trend. However, the Hurst exponent for the DJA index points out the anti-persistence of the time series, having a tendency to reverse the current trend. Forecasts obtained allow to conclude that the artificial neural networks forecasts are comparatively highly efficient than the ARIMA models forecasts, particularly in the anti-persistence (ergodic) systems.

Ewelina Mela-Owczarek

Interest rates in central bank monetary policy

In recent years there has been a growing trend towards the adoption of so-called direct inflation target strategy as the primary focus for the conduct of monetary policy. Direct inflation target is designed to help the central bank achieve long-run price stability. Within its framework the central bank defines the inflation target in a quantified form and then adjusts the level of official interest rates so as to maximize the probability of target achievement. This paper presents working mechanics of basic interest rates used by central monetary institutions for realization of their strategic goals.

Zygmunt Przybycin

Risk quantification in terms of fuzzy information – fuzzy VaR

The article provides a methodology of calculating a financial instrument's Value-at-Risk rate in the terms of fuzzy market information – fuzzy VaR.

Model of fuzzy Value-at-Risk (fuzzy VaR) was based on the classical VaR model taking into account the theory of fuzzy sets. The article also contains a numerical example to illustrate the proposed methodology of fuzzy VaR calculating.

Tomasz Rólczyński

Analysis of chosen investment decisions taken by Polish households

In recent years a growth of the Polish households is being observed. More and more households have not one, but at least two cars. Poles more often spend the leisure time (holidays, long weekends) abroad and more and more people are making the investment in real estate. Location products are a reply to the increased affluence of the Polish society which are offered by financial institutions for individual clients. It is worthwhile to analyze the investment decisions taken by Polish households, both financial and material. The aim of this article is to present investment possibilities of the individual customer on the Polish market, discussing factors influencing these decisions and presenting results of the questionnaire survey concerning investment decisions taken by Polish households.

Dominika Tomaszewska

Aggregate loss models. Applications and approximation methods for estimation of distributions

The article contains an overview of models describing the sum of the actuarial losses that may arise as a result of random events. The paper presents the application of the presented models to insurance system as well as methods for calculating the probability distribution of random variable describing the implementation of the total amount of losses.

A.I. Sharov, A.S. Korkhin

Ecological and economy model of region's development

The paper describes the dynamic model based on differential equations. It consists of block production, waste recycling, capital development and investment, usage of manpower, that allows to reflect the interaction of industrial, ecological, and social factors. Computation of optimal path of region's growth is based on criteria of maximum average discount rate of usage per employee. The model can be used for planning of region's growth for particular interval.

A.I. Sharov, A.S. Korkhin, A.S. Avdiushchenko

Multicriteria problem of economic system control

Method of optimum control of economic system development, which means a state, a region, an enterprise is proposed. The method is based on ranging indices of economic system development according to their rates of growth. On the basis of comparing actual grades with standard ones, set by a person taking decision, the connection closeness between the indicated ranks is determined by using the coefficient of rank correlation. If the coefficient is more than fixed threshold, the economic system develops in a proper way. Otherwise the distinctive trajectories of indices of the economic system are determined, which give ability to obtain the coefficient of rank correlation higher than threshold at the end of planning period. The example of solving the problem "how to manage the machine-building enterprise in Ukraine" is given.

A.I. Sharov, A.S. Korkhin, L.M. Solodovnik

The model of coal association's planning with ecological factor

An article describes the solution for two criteria optimization work of coal association. The first criterion is a maximum profit. The second criterion is a minimum usage of public funds. Unknown variables are investment in production and ecology (mine reclamation, storage of coal inside the mine). The source of financing can be self-financing, bank issued loans, and government loans. The model is dynamic and consists of differential equations. It can be used for flexible planning.

Justyna Zygmunt

Investment expenditures' structure in Polish quoted industrial companies

The analysis of directions and amount of funds engaged in company's investment activity might be executed on the basis of investment expenditures. This article provides the investment expenditures description, as well as underlines the essential issues related to investment expenditures application to empirical studies over company's investment activity. The expenditures in question were the ground to investment activity analysis in Polish quoted industrial companies.