ECONOMIC COMPUTATION AND ECONOMIC CYBERNETICS STUDIES AND RESEARCH, VOL. 41, ISSUE 1-2/2007
ABSTRACTS

Professor Adrian Victor BĂDESCU , PhD
Radu Nicolae CRISTEA, PhD-candidate
Department of Economic Cybernetics
Academy of Economic Studies, Bucharest

GROUP DECISION MODELS USING FUZZY SETS

In this paper we try to implement a new perspective on the mode in which decisions are taken using fuzzy linguistic concepts in order to determine new objective sequences over the alternatives.

The paper argues that in real situations the fuzzy mathematical approaches are necessary when the information contained by the decision maker is not sufficient in establishing a correct decision. Fuzzy linguistic allows the decision maker to introduce in his model a certain degree of interpretations like opinions over the set of alternatives and constraints, and degrees of assurance over his evaluations and over a specific set of selected alternatives.

Key words: fuzzy sets, social choice, nonlinear optimization, fuzzy linguistic.

Aida TOMA, PhD
Department of Mathematics
Academy of Economic Studies, Bucharest

ROBUSTNESS ASPECTS FOR SOME FUNCTIONALS BASED ON DIVERGENCES

In this paper we consider a class of parametric estimators obtained by making use of a dual representation of divergences. We compute the corresponding influence functions and show that the B-robustness property could be fulfilled if the divergence is appropriate chosen. We illustrate this result by selecting some power divergences to estimate in the indicated mode the variance of the univariate normal model.

***Keywords**: divergence, parametric estimation, influence function, robustness.*

Professor Tudorel ANDREI, PhD
Associate Professor Andreea Iluzia IACOB, PhD
Lecturer Liviu Bogdan VLAD, PhD
Academy of Economic Studies, Bucharest

TENDENCIES IN THE ROMANIA'S REGIONAL ECONOMIC DEVELOPMENT DURING THE PERIOD 1991-2004

The objective of this paper represents the analysis of the way the Romania's economic integration in the EU will influence the regional specialization and industrial activities localization within NUTS (the eight regions of Romania) during the period 1991-2004, using absolute measures (Herfindahl index).

***Key-words:** regional specialization, geographic concentration, panel data, fixed effect model, random effect model.*

Luiza BĂDIN, PhD
Department of Mathematics
Academy of Economic Studies, Bucharest

A NOTE ON SOME EXACT JACKKNIFE AND BOOTSTRAP ESTIMATORS

The remarkable evolution in computer technology in the last three decades, the high speed and the power of the new generation of computers stimulated the development of the so-

called computer intensive statistical methods. Bootstrap method has rapidly gain popularity among statisticians, becoming a very useful tool in many practical situations, especially when small samples are available and the traditional asymptotical approach

fails in providing reliable results. In this paper we discuss some particular examples of jackknife and bootstrap estimators that can be derived analytically. Since these estimators admit an exact formula, their computation does not require numerical approximation by Monte Carlo simulations.

***Keywords**: jackknife, bootstrap, plug-in principle, resampling, Monte Carlo.*

Cătălina-Lucia COCIANU , PhD
Academy of Economic Studies, Bucharest
Luminița STATE , PhD
University of Pitesti
Vlamos PANAYIOTIS, PhD
Ionian University, Corfu, Greece

PRINCIPAL AXES – BASED CLASSIFICATION WITH APPLICATION IN GAUSSIAN DISTRIBUTED SAMPLE RECOGNITION

The aim of the reported work is to develop a new algorithm for supervised classification using a set of principal axes computed from samples to assure both good recognition performances, and generalization capabilities. The developments are performed in the framework of a probabilistic class model where each class $h \in H$ *is represented by a probability density function defined on* $\mathbf{R}^n$ *; where n is the dimension of input data and H stands for a given finite set of classes. The classes are learned by the algorithm using the information contained by samples randomly generated from them. The learning process is based on the set of class skeletons, where the class skeleton is represented by the principal axes estimated from data. Basically, for each new sample, the recognition algorithm classifies it in the class whose skeleton is the "nearest" to this example. Once a new sample is allotted to a class, the class characteristics (the covariance matrix and the principal axes) are modified accordingly using first order approximations of the new set of principal axes. In order to compensate the effect of the cumulative errors coming from the first order approximations, following to the classification of each block of PN samples, the class skeletons are re-computed using an exact method. Experimentally derived conclusions are presented in the final section of the paper.*

Keywords: *principal axes, supervised learning, pattern recognition, data mining, Gaussian samples*

Cristina COCULESCU, PhD
Romanian-American University, Bucharest

COMPARATIVE EVALUATION OF PARAMETRIC OPTIMIZATION METHODS

Optimization problems aim the edging (maximization or minimization) of a criterion of performance. This criterion may be a function - case in which parametric optimization is on – or a functional (a function of functions) when dynamic optimization is on.

The two big classes of parametric optimization methods – indirect and direct – are different both essentially and in what concerning performances (*convergence speed, computing time and memory needed for resulted algorithms*). *Thus, direct methods are generally slower convergent than those indirect but need less amount of memory.*

Performances of parametric optimization methods are shown through the compromise between convergence speed and resource consumption (*time – or number of operations and computing memory*). *Accepted level for performances is a factor for choosing one method or another.*

In this item we'll show synthetically main theoretic aspects of parametric optimization methods and a comparative analysis of the main parametric optimization algorithms.

Keywords**:** *parametric optimization, gradient, anti-gradient, conjugate directions, relaxation method, random seek, convergence speed, computing time and memory.*

Ciprian Costin POPESCU PhD Candidate
Department of Mathematics
Academy of Economic Studies Bucharest
Sudradjat SUPIAN, PhD
Faculty of Mathematics and Natural Sciences
Padjanjaran University, Bandung, Indonesia
Professor Lia POPESCU
Economic College, Rosiorii de Vede

ASSESSMENT OF DATA FOR A STATISTICAL MODEL

This work describes a multiple linear regression method which is based on generalization of some previous results preeminently obtained by Ma Ming, M. Friedman and A. Kandel in the field of vague sets.

Key Words: *multiple linear regression, triangular number.*

Cătălin SILVESTRU, PhD Candidate
Dana Ştefania COLIBABĂ, PhD
Academy of Economic Studies, Bucharest
Eng. Dragoş Ştefan SILVESTRU
dragos_silvestru@yahoo.com

THE DEVELOPMENT OF THE E-LEARNING PLATFORMS IN THE NEW ECONOMY FOR A BETTER TRAINING OF THE HUMAN RESOURCES

In this paper we are trying to present the evolution of the traditional ways of training in the context of the new economy. Because of the rapid development of the ICT tools the teaching process is going in the direction of virtual classrooms. E-learning platforms are quickly developing and organizations, universities are beginning to use them frequently. The new methods of teaching in our opinion are the result of the new economy and open a door to an infinite potential of development for the e-learning platforms so that the human resource component gets a better training.

Keywords: *new economy, human resources, virtual laboratory, e-learning platforms, tele-education.*

Lecturer Daniela MARINESCU, PhD
Assistant Mioara BÃNCESCU, PhD Candidate
Professor Dumitru MARIN, PhD
Department of Economic Cybernetics
Academy of Economic Studies, Bucharest

FISCAL POLICIES AND MODELING TECHNIQUES RELATED TO ENERGY AND ENVIRONMENT PROTECTION

This paper consists in a theoretical and applicative approach related to sustainable energetic systems and global necessity of environment protection. In the first part of the paper it is reviewed the dedicated literature to sustainable energetic systems. There are presented the characteristics of past and present models built in this field. The 'top-down' category of models and 'bottom-up' category of models are described in a comparative manner. In the end of the first part it is shaped the research perspective in the field of sustainable energetic systems based on most recent developments. Also, are presented the

implications of externalities on competitive equilibrium and on Pareto optimality state, being considered some abstract economies.

Keywords: energy, environment protection, research, modeling techniques

Professor EMIL SCARLAT, PhD
Department of Economic Cybernetics
Academy of Economic Studies Bucharest

FROM VIRTUAL ENTERPRISES TO DIGITAL BUSINESS ECOSYSTEMS: A SURVEY ON THE MODELING AND SIMULATION METHODS

The modern business environment is an interlocking network of large number of groups of people interacting with computer systems, and which themselves interact with a variety of physical and ecological systems to maintain them under conditions of good control. The enormous complexity and vast quantity of information involved make modeling and simulation approaches necessary and yet the existing formalisms available for these activities are not sufficient to reflect their full characteristics.

During the last ten years, two paradigms arose from considering business as a complex system in interaction with other systems from its complex environment. These paradigms refer to the virtual organizations and digital business ecosystems.

In this paper we first discuss the current state-of-the-art of the use of modeling and simulation main techniques and methods on these two kinds of systems. A virtual enterprise is composed of a number of semi-independent autonomous entities (agents) representing different individuals, departments and firms each of which having a range of problem-solving capabilities and resources of their disposal. Sometimes these entities co-exist and compete to each one another in a ubiquitous virtual marketplace. Each entity attempts to attract potential customers for its products and services, with the goal of selling them in a way that maximizes their individual profit. Sometimes, however, one or more of these may realizes that there are potential benefits from pooling resources either with a competitor (to form a coalition) or with an entity with complementary capabilities (to offer a new type of product or service who is demand on the market). When this potential or market opportunity is recognized, the relevant entities go through a process of trying to form a new entity, named virtual enterprise, to exploit the perceived niche.

Then we present the digital business ecosystem as a relatively new concept in the field of business research in which the firms are interpreted to be the equivalents of organisms of biological ecosystems. A business ecosystem is defined to consist of organizations that can be both business firms and public sector organizations. The environment of a DBE consists of things like inflation, interest levels, weather conditions, pollution and other business ecosystems, with which the components of the business ecosystem may interact with but are not active members of that entity. The interaction between a DBE and its environment is a source of unpredictable dynamics.

These two kinds of complex systems have some fundamental properties that make modeling and simulation of them somehow similar. Instead of defining a new set of models for each of them, the paper present a method of build models on two different perspectives: a structural perspective defining elements and relationships of a virtual enterprise and a process perspective defining functions and roles for the evolution and renewal of a business ecosystem as an answer to changing customer demands or market conditions.

This suggests that virtual enterprises and digital business ecosystems can be systematically linked, being two forms of the same entity: the networked virtual company.

Key words: *Virtual Enterprise, Business Ecosystems, Digital Business Ecosystems, Agent-Based Models for Virtual Organizations*

Professor Ion DOBRE, PhD
Lucian PĂUNA, PhD Candidate
Department of Economic Cybernetics
Academy of Economic Studies, Bucharest

DECISION MAKING WITH SIMULATION TECHNIQUES

There are many decision support systems used by managers in the process of managing their organizations. They are very seldom used separately, but rather more at a time. The simulation techniques are considered to be the most important way of backing up the analytical methods used in decision making.

In the present paper we make an overview of the concept of simulation, describing the need, the advantages and disadvantages of using it. We also point out a general setting for the process and the stages one must cover in order to do a proper simulation. Considering it one of the most important stages, we focus on the programming of the model an expose the necessary steps to be followed so that the language can be switched from a natural one into a programming environment.

Key words:. *decision making, simulation methods, simulation stages, programming language*

Professor Ioan TALPOS, PhD
Associate Professor Bogdan DIMA, PhD
Senior Lecturer Mihai MUTASCU, PhD
Senior Lecturer Cosmin ENACHE, PhD
Associate Professor Valentin MUNTEANU, PhD
West University of Timisoara, Faculty of Economics

THE SOCIAL ALLOCATION OF THE RESOURCES: THE OASIS THEORY (I)

The social allocation of the resources is a complex process in which different categories of social subjects interact in a dynamic web of negotiations, conflicts and alliances. The architecture of the power relationships between the various "points of social coagulation" is not unique determined by the "economic reasons". Instead, there is a large set of factors, which influence its exact configuration including not only the economic ones, but also the cultural and behavioral variables. Thus, this paper intends to put forward a model of the basics mechanism of the social allocation of the resources in the framework of a version of the ***mandate theory*** *developed in Talpos et al (2005).*

Part I of the paper deals with the elements of the theoretical foundation based on a special definition of state as the dominant agency in a social space, agency that controls the resources critical for social development. This control is contested by the ***negotiation / parallel associations*** *and could be lost under a particular set of conditions.*

Part II is an attempt to examine some empirical evidences in the favor of some results derived from this foundation.

The main conclusion of the paper could be resumed by the idea that the access to the social resources is not only a matter of "brute" social power but also a result of certain cultural paradigm, which characterize a social space. Finally, the "water masters" should live together with the other in the same sometime fragile oasis sanctuary.

JEL Classification: H1, M14, O17, P35, Z1

Keywords: agency, negotiation / parallel associations, social allocation, critical social resources, cultural paradigm

Category: Institutional analysis; Power/Exploitation/Conflict

Professor Nora MIHAIL, PhD
Professor Iuliana CETINA, PhD
Academy of Economic Studies, Bucharest

MODELLING THE BANKING PORTFOLIO UNDER RISK CONDITIONS

The acknowledgement of the requirements for an environment in full evolution has stimulated the elaboration and use, on a wide scale, of the methods, systems and options which respond/react to it. There is especially a need for continuous informing systems, working in due time, than for a periodical analysis. A more detailed browse of the environment, the continuous identification and supervision of the areas which need to be informed, efforts made to make the strategy a more flexible one and the increase in the organization's entrepreneurial direction can be very useful. An area which needs to be informed represents an uncertain area, which will affect the strategy, such as an emerging mutual interest. Strategic flexibility means such strategic options which allow a quick and adequate reaction to the environment's fast changing.

Key words*: strategic marketing, banking risk, banking portfolio management.*

Liliana SPIRCU, PhD
Crisan ALBU, PhD
Department of Economic Cybernetics
Ion Gh. ROSCA
Department of Computer Science
Radu ŞERBAN
Department of Mathematics
Academy of Economic Studies, Bucharest

EDUCATIONAL PROCESS, A MULTI INPUTS AND MULTI OUTPUTS PROCESS

Educational institutions worldwide are increasingly the subject of analyses aimed at defining, measuring and improving efficiency. Despite the importance of efficiency measurement in education, it is only recently that more advanced econometric and mathematical programming frontier techniques have been applied to primary and secondary schools, university departments and universities as a whole. In this paper we shall briefly present the opinions related to selecting the inputs and outputs in an analysis of the educational process, what techniques of measuring the efficiency that we could use, as well as a controversial version of ordering an educational units group according to"scores".

Keywords: *educational process, measuring efficiency in education, education inputs and outputs, DEA techniques, scores.*

Professor Ion LUNGU, PhD
Department of Economic Informatics
Academy of Economic Studies, Bucharest
Sorin MANOLE, PhD
"Constantin Brâncoveanu" University, Piteşti

ESTIMATION OF NONPARAMETRIC REGRESSION FUNCTION

To express the dependence between two variables, when many pairs of the values of first variable and the corresponding values of second variable are known, we use the regression function. The parametric regression is used widely in practice, but, in many cases, the inferring of the relationship between these variables is difficult. Because this reason, the nonparametric regression becomes very important.

In this paper, for estimation of nonparametric regression function we use kernel smoothing and Fourier series estimation. In the case of the first method, the estimator is derived by covolving the raw estimator with a dilated version of the kernel function. In the other case, the estimator is truncated Fourier representation of the raw estimator. In the last part, we show that the two methods, which seem completely unrelated methods, are essentially equivalent under certain circumstances.

Key words: *nonparametric regression, raw estimator, kernel function, orthogonal series, Fourier series.*

Cristina ANDREICA, PhD

Commercial Academy, Satu - Mare
Professor M. ANDREICA PhD
Department of Management
Academy of Economic Studies, Bucharest
Romulus ANDREICA, PhD
Ioan MICLAUS, PhD
Commercial Academy, Satu – Mare
Mihai UNGUREANU, PhD
Romanian-American University, Bucharest

CONCLUSIONS ON USING THE STATISTICAL METHODS IN FORECASTING THE STRUCTURE EVOLUTION OF AN ECONOMIC INDICATOR SYSTEM

The paper presents the conclusions reached by the authors after implementing several forecasting models regarding the long term evolution of the economic indicators, at a particular firm. The experiments were made according to a specific structure of the economic indicator system, by taking into consideration the financial and statistical correlations among indicators.

Key words: *forecasting model, economic indicators system, statistical correlations, simulation algorithm, holding indicator level, working hypotheses.*

Ion PURCARU, PhD
Gabriela BEGANU, PhD
Department of Mathematics
Academy of Economic Studies, Bucharest

SOME CONSIDERATIONS ON A GENERALIZED MEASURE OF DIVERSITY AND GUIASU'S MAXIMUM DIVERSITY PRINCIPLE

Some considerations on the diversity measuring, on a generalized measure of diversity and on Guiasu's Maximum Diversity Principle are presented in this paper.

Key words: *information, entropy, diversity measuring, diversity of order* α *and type* β*, Maximum Diversity Principle.*

MSC 2000: 94A17, 62P20, 91B82

Lecturer Aniela Raluca DANCIU
Academy of Economics Studies Bucharest
Assistant Mihaela GRUIESCU
Romanian-American University, Bucharest

THE POLITICAL RISK ASSESSMENT BASED ON THE COUNTRY RISK INDEX IN ROMANIA AND BULGARIA

The last fifteen years have been a time of much change for the Central and Eastern European Countries. The region as a whole has been struggling with the collapse of Socialism and the painful transition to democracy and capitalism. Periods of change and transition such as this often contribute to increased risk of conflict, and can lead to the outbreak of violence, as was unfortunately the case in the Balkans. In this paper, we shall examine two countries – Bulgaria and Romania– with the goal of evaluating the potential risk of conflict developing.

Key words: *political risk, volatility score, country risk index, risk potential.*

Professor Stelian STANCU, PhD
Department of Economic Cybernetics
Academy of Economic Studies, Bucharest
Aristotel UNGUREANU, PhD
ARACIS, Romania

MODEL OF GENERAL DYNAMIC EQUILIBRIUM, CALCULABLE AT THE REAL SECTOR LEVEL OF THE ROMANIAN ECONOMY

The paper is making a brief presentation to a model of Calculable General Dynamic Equilibrium at the level of real sector, being an attempt for engendering a general model to the level of a national economy, which will include all the economy sectors

The model is distinguished through the depth of the economic and mathematic landing and through the facility of finding the dependence from the econometrical model. Thanks to it construction and the covered degree, the model allows econometrical processing and forecasts about the economy evolution

Key words: *economic and mathematic model, real sector, macroeconomy, dynamic equilibrium*

Professor Virginia MARACINE, PhD
Department of Economic Cybernetics
Academy of Economic Studies, Bucharest

AGENT-BASED MODELS OF SHARING KNOWLEDGE IN VIRTUAL ORGANIZATIONS

"Like water, this rising tide of data can be viewed as an abundant, vital and necessary resource. With enough preparation, we should be able to tap into that reservoir and ride the wave – by utilizing new ways of channel raw data into meaningful information, in turn, can then become the knowledge that leads to wisdom"

Les Alberthal (1995)

Gheorghe ZAMAN – Correspondent Member of Romanian Academy of Science
Zizi GOSCHIN, PhD
Department of Statistics and Econometrics
Academy of economic Studies, Bucharest

ANALYSIS OF MACROECONOMIC PRODUCTION FUNCTIONS FOR ROMANIA (Part one – the time-series approach)

In this research we have appealed to aggregate production functions in different time-series analysis of Romania's economic growth from the standpoint of the intensity of using capital and labour factors, as determinant elements for the level of production and GDP.

Key words: *production function, Cobb-Douglas, CES, elasticity of substitution, technological change.*