ECONOMIC COMPUTATION AND ECONOMIC CYBERNETICS STUDIES AND RESEARCH, ISSUE 3-4/2008

ABSTRACTS

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VALUE AT RISK: A COMPARATIVE ANALYSIS

This study develops a comparative analysis concerning Value at Risk measure for a portfolio consisting of three stocks traded at Bucharest Stock Exchange. The analysis set out from 1-day, 1% VaR and has been extended in two directions: the volatility models and the distributions which are used when computing VaR. Thus, the historical volatility, the EWMA volatility model, GARCH-type models for the volatility of the stocks and of the portfolio and a dynamic conditional correlation (DCC) model were considered while VaR was computed using, apart from the standard normal distribution, different approaches for taking into account the non-normality of the returns (such as the Cornish-Fisher approximation, the modeling of the empirical distribution of the standardized returns and the Extreme Value Theory approach).

The results indicate that using conditional volatility models and distributional tools that account for the non-normality of the returns leads to improved VaR measures. For the considered portfolio VaR computed on the basis of a GARCH (1,1) model for the volatility of the portfolio returns where the standardized returns are modeled using the generalized hyperbolic distribution seems to be the best compromise between precision, capital coverage levels and the required amount of calculations. Moreover, the Expected Shortfall risk measure offers very good precision results in all approaches, but at the cost of rather high capital coverage levels.

Key words: *Value-at-Risk, Expected Shortfall, risk management, volatility model, distribution modeling*.

JEL Classification: G 32

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MODELING SYMPATHY AND DECISION ERROR IN THE ULTIMATUM BARGAINING GAME

We investigate the use of the logit quantal response model in an ultimatum game environment. We prove the existence of a unique equilibrium for this game which is different from the subgame perfect equilibrium. We offer several predictions concerning proposer's behavior, by investigating the average offer he makes, his propensity to make errors and the way responder's acceptance behavior influences his decisions. These predictions are also analyzed by incorporating sympathetic considerations in proposer's utility function.

Key words : *equilibrium, sympathy, error, ultimatum, logit model.*
JEL Classification : C72, C73, C78.

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THREE WAY ANALYSIS OF THE RELATIONSHIP BETWEEN LIFESTYLE TYPES AND DISCRIMINATION ON ESS DATA

The paper investigates, starting from the four lifestyle clusters identified in previous research on ESS data, the relationship between feeling discriminated and discriminating others, in the context of the values and attitudes underlining a particular lifestyle choice. The method used for analyzing the presumed influence is the three way analysis, considering the subjects, the lifestyle clusters and the variables referring to discrimination as the directions of the analysis. The research identifies groups at risk for developing discrimination complexes, or inclination towards discrimination, between people belonging to a specific lifestyle cluster. In this way, the connection between the values and attitudes, the lifestyle they shape and the natural predisposition to discriminate or to feel discriminated appears neatly, which enlarges the perspective on discrimination, in the sense that people don't discriminate (or feel discriminated) on criteria regarding income, or social status, taken independently, but these behaviours rather depend on a complex set of factors which is to be looked for in lifestyle patterns.

Key words: *lifestlye, discrimination, European Social Survey, three-way analysis*
JEL Classification: A13, C 31

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MODELLING OF THE RELATIONSHIP BETWEEN FOREIGN DIRECT INVESTMENT AND ECONOMIC GROWTH

The purpose of this paper is to determine whether there is a relationship between foreign direct investment and economic growth for the Romanian economy and if such a relation can be determined, what type is it. To this end we apply an entire array of cointegration techniques: the Engle – Granger procedure, the ECM procedure and the Johansen test. We are am also concerned with structural breaks and and therefore use the Gregory–Hansen technique to determine whether there is a structural change in the data series.

Key words*: Foreign Direct Investment(FDI), Econometric Models, Cointegration, Granger Causality, Error Corection Model(ECM), Exogenity.*
JEL Classification: C01, C22, C23

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AGENT-BASED MODELLING OF FORGETTING AND DEPRECIATING KNOWLEDGE IN A HEALTHCARE KNOWLEDGE ECOSYSTEM

In this paper, we discuss a framework for healthcare knowledge ecosystems (HKE) modelling with effective knowledge share, depreciation and forgotten. The term of Knowledge Ecosystem (KE) is

used to define a community of practice that builds knowledge in a bottom-up, networked and dynamic fashion. A HKE aims to organize and manage knowledge for the human disease information area through a unified framework. Using the agent-based technology and the healthcare knowledge, a KE enables information retrieval and knowledge sharing across all interested users (patients, doctors, medical researchers, nurses, occupational assistants, family members, IT specialists, etc.). The digital species of this kind of ecosystems consist of medical ontologies that have emerged in the last years because of the need for common language for effective communication across diverse digital and non-digital sources of biological/medical/healthcare data and knowledge.

In the first part of the paper we describe how knowledge ecosystems evolve from digital ecosystems (DE), and what it takes to a DE to become a KE. Then we discuss the importance and functions of knowledge sharing, depreciation and forgotten in elaboration and use of a KE, and how KE design can benefit from agent-based modelling techniques, semantic ontologies and knowledge formation rules. In the end, we will draw some particular features that HKE and its forgetting and depreciating functions has it in the context of the rehabilitation process of people with disabilities and the role of interactions between the digital medical species and other species from neighbouring knowledge ecosystems.

Keywords: *Knowledge ecosystem, agent-based modelling, knowledge sharing, knowledge forgetting healthcare knowledge ecosystem, home health rehabilitation.*

JEL Classification: D 83

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A MODEL TO ESTIMATE THE PUBLIC DEBT SUSTAINABILITY

There is a long period since the problem of public debt sustainability captures the attention of economists. However, there is no unanimity concerning an adequate unique sustainability indicator or function generally accepted. Just in this line of elaborating new models and improving methodologies in order to quantify the impact of various factors on public debt sustainability is our paper. Moreover, last years, during its pre- and post-accession into EU period, Romanian economy is facing to numerous problems. Among these, the public debt sustainability plays a central role, its implications practically expanding on all fields connected to the economic dynamics.

Key words: *public debt, sustainability function, contour plot, primary deficit, interest rate.*
JEL Classification : C15, C51, H68.

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THE ECONOMETRIC MODEL OF A RANDOM SYSTEM THAT GENERATES TIME SERIES DATA

This article approaches the econometric modeling of a time series data, according to the hypothesis that the random variables which generate it may be defined on different probability spaces.

Its content represents the beginning of the econometric modeling of the feedback between the economic variables and the dynamic, stochastic and simultaneous relations between them.

Key words: *chronological series (time series data), probability spaces, product of probability spaces, stochastic processes, time series, economic variables, econometric model.*

JEL CLASSIFICATION: C51
AMS 2000: 60G99

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ADVANCED TECHNIQUES IN FINANCIAL AUDIT

The increasing complexity of the economic activities, the significant volume of the data taken into consideration today at the level of a specific organization, the active competition environment have underlined the necessity of performance accounting and audit tools useful to answer to the "hunger" of information relevant to the users. Such a responsibility cannot be accomplished by the classical audit tools, by themselves, fact that leads to the increased usage of the software tools specialized in audit.

In the Romanian environment, important applications in this area are not recognized. From this point of view, the research recommends a multidimensional analysis of the accounting and financial data, integrating Data Mining techniques using Microsoft SQL Server 2005.These techniques can support auditor's judgment offering complex and automatic analysis over a big set of data, discovering models, patterns or unnoticed tendencies. In this way, the research proposed the analysis of a set of data with a view to detect frauds, defining trends, patterns of the transactions using DMX language (Data Mining Extensions), analyzing and identifying exceptions, calculating checking samples and the selection of those samples.

Keywords: *Financial audit, Data Mining, Clusters analysis, Association rules.*
JEL Classification: M42

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ALGORITHMS FOR HIERARCHICAL CLASSIFICATION WITH APPLICATIONS IN PORTFOLIO MANAGEMENT

In this paper we propose two algorithms for hierarchical classification: CLAS.1, based on an ultrametric distance, and CLAS.2, based on a scatter function. We study their properties. We show that the classification constructed by CLAS.2 algorithm is identical with the classification constructed by CLAS.1 algorithm if the ultrametric distance used in the first algorithm is compatible with the scatter function used in the second algorithm. We develop two applications in Microsoft Visual Studio based on the algorithms proposed, using C# language. The software developed will be used to classify

the shares from Bucharest Stock Exchange which had profit during the last two years, in order to find similarities and differences between these shares and build a diversified portfolio.

Key words: *classification, algorithm, software, portfolio management.*

JEL Classification: C02, C89

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EMPLOYMENT RATE PROGNOSIS ON THE BASIS OF THE DEVELOPMENT ENVIRONMENT TREND DISPLAYED BY YEARS-CLUSTERS

The authors analyze the dynamics of the employment rate in Romania and propose a forecast model for it.

In the paper we start with the hypothesis that the dynamics of the employment rate has a specific trend displayed by years-clusters differentiated on the value and the sign of the dynamics indexes of the phenomena by which we define the economic environment.

The forecast method that we propose takes into consideration the environment conditions in which the studied phenomenon evolves and it implies the use of statistical methods of multivariate analysis (Principal Component Analysis and Discriminant Analysis).

The application of such a forecast method supposes an algorithm that implies several stages: (1) the evaluation and synthesis of the inter-relations among the phenomena by which we describe the development environment employment rate dynamics; (2) the identification of the years-cluster to which the desired forecast horizon is classified; (3) the estimation of the employment rate dynamics for the specified forecast horizon. The proposed forecast model, examining the development environment of the influence factors, may be used for simulating forecast alternatives that can be considered for founding the economic development strategies.

Key words: *employment rate, influence factors, trend by years-clusters, principal component analysis, discriminant analysis.*

JEL Classification: E24, E27, J21

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PRICING BONDS AND EUROPEAN OPTIONS IN A MILD STOCHASTIC ENVIRONMENT

The paper deals with the problem of pricing derivative financial products.

*The most frequently used option pricing method is that given by the well-known **Black-Scholes** model (1973). This model starts from the assumption that the market uncertainty*

*can be modeled by **a white noise (Wiener process).** The Black-Scholes option price results as a solution of a second order partial differential equation.*

*The present paper starts from an idea of the late **Professor Aristide Halanay from Bucharest University.** The idea consists of considering a more regular behaviour of the market, called "mild stochastic environment". In this framework, the "fair" price of an option is the solution of a first order partial differential equation.*

Keywords: *option, discount bond, Black-Scholes, arbitrage-free portfolio, "mild" stochastic environment.*

JEL Classification: G12

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MULTICRITERIAL ANALYSIS OF ECONOMIC-FINANCIAL PROCESSES

Multicriterial analysis requires the synthesis of the evaluations made according to each criterion severally, in order to construct an aggregated indicator of estimating the studied subjects. The polygon method is approached especially as regards the magnitude of the analyzed subjects.

We have proposed an evaluation of these subjects, also regarding the regularity of their dynamics and at the same time, an aggregated magnitude-regularity indicator.

***Key words**: multi-criteriality, economic growth, economic-financial convergence.*

JEL classification: C61

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MULTI-ITEM INVENTORY MODEL WITH CONSTANT RATE OF DETERIORATION AND ASSURANCE STOCK

In this paper, we present a method to solve a deteriorating multi-item inventory model with limited storage space and an assurance stock. The demand rate for the items is finite, the items deteriorate at constant rates and are replenished instantaneously. The model is solved by a non-linear programming method. A numerical example is presented to demonstrate the application of the proposed approach.

Keywords: *inventory; deterioration; assurance stock; non-linear programming method.*

JEL Clasification : **C02, C61,C63.**

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THE EXPONENTIAL GENERALIZED BETA DISTRIBUTION OF THE SECOND KIND

In this paper we present and study a four parameter generalization of the exponential beta distribution, which enables accommodating diverse levels of skewness and kurtosis for non-normal data as well as providing a good fit to normally distributed data. We obtain expressions for its moment generating function, mean, variance, higher order central moments, skewness and kurtosis. Also, we present the important role of this distribution and some of its applications.
Key words*: beta distribution, probability density function, mean, variance, skewness, kurtosis.*
JEL Classification: C16, C46

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ONE TIME ONLY INCENTIVES AND INVENTORY POLICIES FOR DETERIORATING ITEMS

This paper presents inventory policies for deteriorating items under incentives of price discount for one time only. It is quite a common practice to offer special discount to motivate the buyer to order in larger than regular order quantities. Such special sales are available for a limited time only. The policy implications of various scenarios are highlighted. The discussion is validated with the numerical example.
Key words : *Price discount, deteriorating units, special order quantity.*
JEL Classification : 90B05