ABSTRACTS, 2/2010

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CONSIDERATIONS ON THE INFORMATION AND DIVERSITY MEASURES

Abstract. *In this paper, we propose a parametric measures family of information and of diversity, which is considered as a generalization of the classical measures of entropy (Shannon (1948), Guiaşu (1971)) and of diversity (Gini (1912), Simpson (1949), Onicescu (1966), Guiaşu (2003)). Certain connexions between the proposed measures and other measures as well as some optimal probability distributions are presented too.*

Keywords and Phrases: *entropy, diversity, weighted measures, optimal probability distribution.*
2000 Mathematics Subject Classification: 62P10, 62P12, 62P20, 62P25, 91B82, 94A17
JEL Classification: C02, C44, C61, C63

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INVESTIGATION OF EXCHANGE MARKET PRESSURE IN CENTRAL EUROPEAN COUNTRIES USING THE GIRTON-ROPER MODEL

Abstract. *This paper applies the Girton-Roper model of exchange market pressure (EMP) on four Central European economies (Czech Republic, Hungary, Poland, Slovakia) over the period 1995-2008. The results suggest that there is a strong negative relation between domestic credit and EMP in all countries. We also found evidence of positive effect of domestic income on EMP in most of the countries. The paper reveals that EMP in the Czech Republic and Hungary was mostly absorbed by changes of exchange rate while changes in reserves absorbed EMP in Slovakia. The levels of EMP estimated do not pose a significant threat for fulfillment of the exchange rate stability convergence criterion.*

Key Words: *exchange market pressure, Girton-Roper model, euro-candidate countries*

JEL Classification: C32; F31; F36

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MODELING PROJECT MANAGEMENT COMPETENCIES USING AN ONTOLOGICAL APPROACH

Abstract. *The competence-based human resource management has the potential to facilitate organizational change, enhance competitive advantage as well as increase financial performance and productivity. The identification, modelling and assessment of competencies represent the foundation of the competency-based human resources management. The paper proposes an ontology-based model of the project management competencies. The model is consistent with the IPMA Competence Baseline (ICB), the competence standard of the International Project Management Association.*

The model structure and implementation are discussed. The authors also present the model application and the results obtained for an IT company. The future development of the project management competence model is also discussed.

Key words*: competence-based management, competence catalogue, ontology, project management competencies, competence standard, ICB, IPMA.*
JEL Classification: **J24, J44, M12, M54, C63**

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OPTIMIZING THE ECONOMIC PRODUCTION QUANTITY MODEL WITH DISCRETE DELIVERY ORDERS

Abstract. *Similar to other existing classical production and inventory control models, the economic production quantity (EPQ) model is derived based upon some assumptions that cause its limited real-world applications. One of the assumptions in this model is that the orders are delivered in a continuous and constant rate. In order to make the EPQ model more applicable to real-world production and inventory control environments, in this research, an EPQ model is considered in which the orders are delivered discretely in the form of multiple pallets. Under this condition, the EPQ costs are derived and a new model is developed to find the optimum values of both the economic order quantity and the reorder point. Then, an optimal solution algorithm is proposed and a numerical example is presented to demonstrate the application of the proposed methodology.*

Key Words: *EPQ; Multiple Discrete Deliveries; Optimization.*

JEL Classification: C 60

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POOLING EQUILIBRIA AND SHUTDOWN OF THE LEAST EFFICIENT TYPE POLICY ON CREDIT MARKETS

Abstract. *In the paper, we propose a Principal-Agent model designed for the relationships on credit markets. Firstly, we derive the characteristics of the optimal contract in the case of asymmetric information, assuming that the Principal doesn't know the efficiency parameter of the Agent. Then, we analyze two special types of contracts, namely pooling contracts and the shut down of the least efficient type policy. We derive conditions for such policies to be implemented by the Principal.*

Keywords: *asymmetric information, adverse selection, informational rent, optimal contract, Pareto optimality, pooling equilibria.*

JEL Classification: C61, D.82, D86

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FINDING COMPANIES' BANKRUPTCY CAUSES USING A HYBRID GREY-FUZZY MODEL

Abstract: *This paper attempts to put forward a hybrid model which combines the advantages offered by grey systems theory with the ones offered by fuzzy theory and which tries to identify the causes that are influencing financial failure of a company. For this reason, a grey knowledge matrix will be determined. Its elements are obtained by the composition of the symptoms' matrix with the causes' matrix, as it is described by fuzzy theory. The quantitative variables taken into account are shaped using grey systems theory, while the qualitative variables are being transformed in quantitative ones by using some experts' opinion and by creating "expertons". Expertons are in fact intervals built using the ϕ-fuzzy sub-set and the opinion of several experts over a certain problem. The grey knowledge matrix can be composed with a one-dimensional symptoms matrix for a certain company and in this way the causes that generate the anomalies at company's lever can be identified. Knowing the causes, and acting properly on them, we can improve company's financial situation and lengthened its life.*

Key Words*: Grey Systems Theory, Fuzzy sub-sets arithmetic, Fuzzy Sets, Financial Health, Grey Knowledge Matrix.*

JEL Classification: C 02

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A HYBRID INTELLIGENT MODEL USING TECHNICAL AND FUNDAMENTAL ANALYSIS TO FORECASTING STOCK PRICE INDEX

Abstract. *In this paper we develop a hybrid forecasting model which combines artificial intelligence and technical analysis to predict short-term stock price index. The results show that using technical indices as neural network's inputs yields good performance in forecasting short-term prices, but this model cannot predict long-term prices well. To overcome this shortcoming we have exploited a fuzzy inference system based on analyzing the historical effects of macro economic variables on the stock markets' indices. Our forecasting models differ from the other ones in two main aspects: the first one is analyzing previous macroeconomics trends in order to build a Mamdani FIS and the second one is providing two different techniques for short-term and long-term predictions.*
These models allow decision makers to forecast prices by using minimum data and calculations. The good performance of the proposed model is confirmed by real stock market data.

Keywords: *Forecasting, Stock price index, Technical analysis, Fundamental analysis, Neural networks, Fuzzy inference system.*

JEL Classification: G17, G15, E44

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STUDIES ABOUT THE VARIABLE COUPON RATE ATTACHED TO THE MUNICIPAL BONDS LISTED AT BUCHAREST STOCK EXCHANGE

Abstract. *The current study highlights the variable coupon which remunerate the municipal bonds listed at the Bucharest Stock Exchange, insisting on the extra interest offered over the interbanking average interest rate. We identified the maturity of the bonds and the local decentralization level as very significant factors for the interest spread. So, when the maturity of the loan increases, the effect is a decreasing spread. In the same time, as the municipality is more independent from the central budgetary resources, the municipal bonds become more credible. As effect, their remuneration is lower, proportionally with the smaller risk the investors assume. The most important risk we have to analyze in the municipal bonds area are the market risk, the liquidity risk and the credit risk. The premium attached to them has to reflect the coupon value, because every extra risk has to be remunerated. But our computation demonstrated that the coupon rate is smaller than it should be, because the liquidity premium was negative. So our conclusion is that Romanian municipal bonds we studied are incorrectly paid.*

Key words*: municipal bonds, coupon, spread, maturity, risk, decentralization.*

JEL Classification: G12, H61,H72,H74

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ECONOMIC PROCESSES STUDY THROUGH FUZZY LOGIC

Abstract. *The paper presents a new concept for Fuzzy Logic in economic processes. This new concept is based on the model projection of the Fuzzy Consumption Functions.*

The optimization of the Fuzzy Utility Function for Consumption is done using the system matrix concept (matrix of the Fuzzy Utility Function for Consumption). This matrix concept is based on two categories of factors: objective factors (the physical, chemical, biological and artistic properties of goods) and, respectively subjective factors (consumer's interest, preference and psychological state).

The main benefits of the Fuzzy Logic in economic processes (performance; productivity; simplicity and lower cost) are presented too.

Key words: *Fuzzy Logic, Model Projection, Consumption, Optimization.*

JEL Classification: C51, C53, C61, C65

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AN ECONOMIC MODEL FOR MULTI-SERVICE OVERLAY MULTICAST NETWORKS BASED ON WALRASIAN GENERAL EQUILIBRIUM

Abstract. *Overlay multicasting solution has recently been marked as a paradigm shift in order to disseminate data in application layer. Since the end-users may belong to different administrative domains, they are usually selfish; resulting in degradation of the aggregate throughput (welfare) of the network. Thus, the main challenge in order to design the mechanisms for such networks is exploiting the inherent selfishness of the end-users in such a way that the total welfare is maximized. This paper presents an economical model for multi-service overlay networks based on producer-consumer theory in which each offered service can be thought of as a good and the origin servers and the users who relay the service to their downstream nodes can thus be thought of as firms of the economy. Also, the end-users can be viewed as consumers in the economy. By leveraging the concept of Walrasian general equilibrium, the proposed model tunes the price of the services in such a way that the total demand equals the total supply. The bandwidth allocation by the proposed mechanism results in Pareto optimality of the system in the sense that the total welfare is maximized.*

Keywords: *Overlay Multicasting, Bandwidth Allocation, Microeconomics, producer-consumer theory, Walrasian Equilibrium.*

JEL Classification: A12, C51, C63, D03, D41, D51

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A FUZZY APPROACH OF THE ENVIRONMENTAL IMPACT AT COMPANY LEVEL

"So far, as the laws of mathematics refer to reality, they are not certain. And so far as they are certain, they do not refer to reality." - Albert Einstein, Geometry and Experience

Abstract. *No matter at what level (international, regional, national, local or at a company's level), stopping or reducing the environmental impact is one major objective in the context of globalization and sustainability.*

The aim of this paper is to define a theoretical model for an indicator associated to the degree of the impact a company has on the environment, indicator which can be calculated for every environmental element – water, air, soil.

The mathematic model is based on fuzzy logic, a multivalent logic which offers a better way in economic terms, or more relevant, to assess the degree of a company's impact on environment.

Some of the uses of such an indicator can be related to risk assessment of investments in clean technologies, to reporting environmental performances, or for green taxes, green auditing etc.

Keywords**:** *Fuzzy logic, pollution , degree of environmental impact.*

JEL Classification: Q53, C02, C65

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IMPROVING NEW PRODUCT DEVELOPMENT THROUGH INNOVATIVE LEADERSHIP QUALITIES WITHIN SMES

Abstract. *New Product Development (NPD) is crucial for Small and Medium Enterprises (SMEs). Innovative leadership qualities play a significant role in achieving competitive edge and successful NPD within SMEs. However, the emerging environmental uncertainties in global markets urge management to be innovative in order for them to effectively deal with these dynamic challenges. This paper reports on a study that aims to evaluate if managers of SMEs in the Western Cape possess innovative leadership qualities to deal with the environmental uncertainties in order for their companies to remain competitive. The findings indicate that these companies were competitive because their managers demonstrated innovative leadership qualities. These managers exercised open door policies for accessibility to their employees. The employees took control and became responsibilities in all they did in the workplace. This survey was conducted at nine SMEs in the Western Cape, South Africa*

Keywords: *New Product Development, Innovative Leadership, Management, Performance, SMEs, South Africa.*

JEL Classification : C53, C88, C 63, C92, O32, Q56, L21

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A TWO-COUNTRY DISCONTINUOUS GENERAL EQUILIBRIUM MODEL

Abstract: *The aim of this paper is to develop a continuous time general equilibrium model for a two country Lucas type economy. The model assumes that the output in the two countries follows a jump-diffusion stochastic process. We obtain the results concerning the evaluation of financial assets, the determination of the exchange rate, of the interest rate, and of the risk premium in this two-country economy.*

Keywords: *general equilibrium model, two-country Lucas economy, exchange rate, risk premium, jump-diffusion.*

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IMPACT OF OİL PRİCES ON INFLATİON IN OİL-IMPORTİNG COUNTRİES: THE CASE OF TURKEY

Abstract. *This study aims at investigating the link between international oil prices and inflation in case of Turkey, a small open industrial economy without oil resources, for the period 1983:01 and 2006:05. Granger causality test is employed in this study to investigate the relationship and causality between the oil prices and inflation for Turkey. The results of Granger-causality test show that the causality is running from oil prices to inflation. Therefore, we conclude that increases in oil prices have had a positive impact on inflation in Turkey over the period between 1983:01 and 2006:05.*

Key words: *Oil prices, Inflation, Cointegration, Granger causality, Turkey.*

JEL Classification: E31, C2, Q43

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EMPIRICAL EVIDENCE: COMPLETE VS. INCOMPLETE INFORMATION CREDIT RISK MODELS

Abstract. *In the present structural credit risk model based on incomplete information, investors cannot observe the firm's default barrier. As a consequence, such a model has both the economic appeal of a structural model and the tractable pricing formulas and empirical plausibility of a reduced-form model. A comparison of default probability and credit spread forecasts generated by this model, and Black – Cox and Merton structural models, using the evolution of SIF Banat firm within the period August 2007 – November 2009, indicates that it reacts more quickly to new information and, unlike the other two models, it forecasts positive short-term credit spreads.*

Key Words: *default risk, asymmetric information, probability of default, credit spread; bond price;*

JEL Classification: G12, G13