

**ECONOMIC COMPUTATION AND ECONOMIC CYBERNETICS STUDIES AND
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**INVESTIGATING CAUSALITY BETWEEN INTERNATIONAL TRADE INFLOWS
AND OUTFLOWS: ROMANIA'S CASE**

***Abstract.** Public finance theory states that, related to the causality relationship between budgetary revenues and expenditures, it could be investigated if revenues adjust due to changes in expenditures, or otherwise, depending on the sense of the causality. This theory could, also, be applied to the components of current account in order to analyze the synchronization between inflows and outflows of international trade. In the case where the two time series are cointegrated, classical Granger causality test could reveal distorted results. Consequently, it can be used an adjusted Granger test based on cointegration equation between the two variables. The aim of this paper is to investigate the causal relationship between exports and imports of Romanian current account, according to the methodology of Engle and Granger. The results could reveal some insights related to the formation of current account deficit, based on the adjustments of inflows caused by changes in outflows, or, otherwise.*

***Keywords:** Granger causality, cointegration, international trade, current account deficit, synchronization hypothesis.*

JEL classification: C22, F10, F32

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**THE PARALLEL METHODS FOR EVALUATING
A STOCHASTIC EQUATION**

***Abstract.** This paper is organised as follows: first, it is given a brief introduction of a simple model for European options price and next, the parallel algorithms applied to this model. Considering the idea given by odd-even cyclic reduction, we start from an explicit scheme obtained by means of finite differences, and give an alternative of evaluating the approximate values using an odd-even cyclic reduction which generates a logarithmic time of execution. Also, it is solved numerically using a parallelised domain decomposition method. The spatial domain is splitted among several processors, with data communicated among the processors using MPI. Interface conditions between domains are calculated using finite differences. For smaller sized problems the communication time is much longer than the computation time.*

***Key words:** tridiagonal systems, odd-even cyclic reduction, forward Euler method.*

JEL Classification: C 200.

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TRADE FLOWS BETWEEN THE CORE AND THE NEW PERIPHERAL EUROPEAN UNION' AREAS

***Abstract.** After the last enlargement towards East, the European Union (EU) established a new peripheral area. In these conditions we propose to identify the degree of divergence of industrial structure between the new peripheral area and the core of the EU (EU-15), by characterizing their trade relations. The question that arises is to find the most appropriate methods to explain much more the trade between the two areas. The aim of this paper is to analyze the trade flows between this two area's countries using some different panel data estimation methods like as Fixed Effect Model (FEM), Random Effect Model (REM), Hausman -Taylor (HT) and Feasible Generalized Least Squares (FGLS). Using HT method to estimate our gravity model, we get unbiased and efficient parameters estimation, even when a correlation exists between the explanatory variables and the specific unobservable characteristics of each individual. Our findings generally support the literature which suggests that country size, difference between Gross Domestic Product per capita, association agreement, political stability, reform progress, landlocked, geographical distance, and real exchange rate may be important drivers that can affect the international trade flows patterns between those two zones.*

***Key-Words:** Gravity models, Panel Data Models, International trade, Comparative advantage.*

JEL CLASSIFICATION: E61, F13, F15, C25

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WORKING OUT FORECASTS ON THE BASIS OF STATISTICAL EXTRAPOLATION PRINCIPLE*

The paper presents a series of new statistical methods which can be used in order to working out some extrapolation-based forecasts.

The study begins with the deterministic, discrete and probabilistic methods. At the same time, two new antithetical concepts, the expanding and constricting of mean are introduced. The linguistic and algebraic models allow the use of fuzzy sets.

The methods proposed to this end are simple but provides an accuracy ε_i , according to the number of significant decimals, whereby the numbers of the used informatic system are represented.

The idea of researching the model where the sequence is approaching to mean, has allowed the estimation of the symmetry/asymmetry coefficients as ratio of the sequence possible combinations.

Key words: forecasting, statistical extrapolation, fuzzy sets, expanding-compressing mean, finite difference equations, chaos.

JEL classification: C 53, P 47

MSC classification: 91B82; 03E72

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ASPECTS OF ANALYZING THE INFLUENCE OF INTERNATIONAL ECONOMIC RELATIONS UPON THE MACROECONOMIC EQUILIBRIUM

***Abstract.** Starting from the economic interpretation of the balance of payments, the conditions in which the situation of this balance depends on the balance of current transactions and on the balance of capitals, finally reflecting the currency reserves of the country, are outlined.*

The modalities of explaining the evolution of the current transactions balance are presented, as well as the fact that an excess of this balance reflects the financing capacity and a deficit reflects the financing requirement of the nation. At the same time, we prove how the situation of the balance of capitals is an increasing function of the ratio between the internal interest rate and the external

*** La prévision**

Une prévision peut être définie comme un ensemble de [probabilités](#) associées à un ensemble d'[événements](#) futurs (Fischhoff, 1994). Cette prévision est basée sur un ensemble d'informations disponibles à l'instant t où elle a été effectuée. Cet ensemble noté Ω_t (l'indice temporel t correspond à l'instant t) représente les données disponibles, les connaissances et les théories concernant le phénomène que l'on souhaite prévoir. La prévision au temps t d'horizon h de la variable Y , considérée comme une [variable aléatoire](#), peut donc s'écrire (Granger et Newbold, 1977) sous la forme d'une fonction de distribution conditionnelle (à l'ensemble d'informations Ω_t):

$$G(y) \equiv \text{Prob}(Y_{t+h} \leq y | \Omega_t)$$

interest rate, as well as the repercussions of the balance of payments account upon the process of inland monetary creation.

There are also shown the risks of an excess or of a deficit of the fixed rate balance of payments and the requirement of a monetary sterilization in order to counteract the variations of external money supply and to diminish the effects upon the relative prices and upon the national income.

Key words: *balance of payments, external debts, balance of current transactions, balance of capital, foreign demand, requirement of financing the nation, internal credit, currency reserve, monetary sterilization, oil prices, inflation, trade deficit .*

JEL Classification: F 59

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EMPIRICAL EVIDENCES FOR THE BUDGET DEFICITS CO-INTEGRATION IN THE OLD EUROPEAN UNION MEMBERS: ARE THERE ANY INTERLINKAGES IN FISCAL POLICIES? (PART ONE)

Abstract. *In the last years, the fiscal harmonization among the European Union members has become a pillar of economic integration and of fiscal and financial stability in the European area. The institutional changes, the semi-failure of the “old” Stability and Growth Pact as well as the recent waves of enlargements all these were put a greater emphasis on this issue inducing a higher pressure for fiscal discipline.*

In this context, the objective of the paper is to examines recent empirical evidences for bilateral and multilateral integration between fiscal policies, as this are synthesised by budget deficits, of old European Union members in the framework of the Johansen co-integration procedure with a preliminary appliance of the principal component analysis. The study finds that the dynamic of European fiscal policies takes place under the impact of some common driving forces which leads to a differentiate behaviour of two sub regional-groups individualized by the budget deficit series evolutionary patterns. Overall, it concludes that there could be find empirical evidences to support the thesis that a process of fiscal integration is currently running at least at the level of old European Union countries.

Key words: *Fiscal policies in E.U., budget deficits, co-integration, Johansen Test.*

JEL CLASSIFICATION: F15, H00, H61

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SOME APPROXIMATIONS USED IN THE RISK PROCESS OF INSURANCE COMPANY

Abstract: *In an insurance company, the risk process estimation and the estimation of the ruin probability are important concerns for an actuary: for researchers, at the theoretical level, and for the management of the company, as these influence the insurer strategy. We consider the evolution on an extended period of time of an insurer surplus process. In this paper, we present some processes of estimating of the ruin probability. We discuss the approximations of ruin probability with respect to the parameters of the individual claim distribution, with the load factor of premiums and with the intensity parameter of the number of claims process. We analyze the model where the premiums are computed on the basis of the mean value principle. We give numerical illustration.*

Keywords: *ruin probability, risk process, adjustment coefficient.*

JEL Classification: C020, G220, G320

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VIRTUAL ORGANIZATION – CYBERNETIC ECONOMIC SYSTEM. MODELING PARTNER SELECTION PROCESS

Abstract. *Nowadays, at the peak development of information and communication technologies, one of the higher forms of informational society in the business area is the virtual organization. The literature presents various theories on the virtual organizations. They examine aspects of organizational, juridical, managerial, economic nature. This paper will introduce a new paradigm of the virtual organization – the cybernetic economic system. Systemic approach goes beyond the virtual organization characteristics, determined by the simple affiliation to the abstract notion of system – which will be proven below. We will determine how this entity, adopted by the real world, adheres to the laws of the economic cybernetic systems. Also, we will identify the specific elements of informational and managerial nature in the lifecycle of the virtual organization.*

Keywords: *virtual organization, cybernetic system, life cycle, information, management, model, technology.*

JEL Classification: D78, D83, D85

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INCREASING COLLECTIVE INTELLIGENCE WITHIN ORGANIZATIONS BASED ON TRUST AND REPUTATION MODELS

***Abstract.** Trust and reputation are fundamental concepts in multi-agent systems, but at the same time are significant to human life. The purpose of this paper is to find a way to enhance collective intelligence within organizations. First, we present some perspectives concerning the concepts of collective intelligence, trust and reputation. Then we suggest four computational models of trust and reputation, describing the main characteristics of each model and based on a cognitive model of trust, it is shown up how trust can increase collective intelligence in an organization. We try to simulate agents' behavior using the preferential attachment hypothesis.*

***Key Words:** Collective Intelligence, Trust, Reputation, Preferential Attachment*

JEL Classification: C 63; C 92

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MANAGEMENT IN TURBULENT CONDITIONS

***Abstract.** The organizational environment is the independent variable in the management process and its main feature is the turbulence. In this context, the organization and management functions are being rethought, emphasizing on the flexibility, extroversion, strong sensitivity to environment and the use of strategic systems in real time.*

Also, there is the shift from strategic planning to strategic vision and the management instruments have new tendencies and approaches, in order to be used effectively. The current management passes through the transition from certainty activities to the management under crisis conditions that requires innovation and ingenuity.

***Keywords:** turbulence, flexibility, extroversion, strategic vision, operational strategy, M.B.O, M.B.E, T.C.R.*

JEL Classification: O32, Q56

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A FORMAL MODEL FOR IMPLEMENTATION OF OR PARALLELISM

***Abstract.** OR parallelism can be exploited when a relationship is defined by more than a clause and a calling subgoal may be unified by more than a procedure header. In such a case, the*

bodies of the clauses involved may be executed in parallel, giving raise to an OR parallel execution. So OR parallelism becomes an efficient method for exploiting alternative solutions in parallel.

In section 1 we concentrated the main problems and limitations which appear in OR parallelism implementation, presenting also the most important result (due to Gupta and Jayaraman) obtained until now with respect to this aspect: the impossibility of simultaneously fulfilling the three criteria which define the implementation of an ideal OR parallel system.

In section 2 we presented the main memory management mechanisms involved in a classical sequential implementation of the Prolog language.

The analysis and characterization of the OR parallel execution models from section 3 are mainly performed relatively to the types of binding environments (centralized or distributed). We present and analyze also models based on multi-agents systems and methods based on stack operations.

Section 4 represents the main original contribution of this paper, building a formal model for OR parallelism implementation and making an analysis of its complexity. The results obtained here formally validate the limitation reported by Gupta and Jayaraman, being also of a significant practical utility regarding possible improvements for OR parallel implementations.

In section 5 we present a classification based on the three criteria, characterizing a set of implementations proposed in the literature or being in use at this time.

Keywords. *Models, Implementation, OR, Parallelism, Lemma, Theorem.*

JEL Classification: C44

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WEB 2.0 AND THE EMERGENCE OF FUTURE ORIENTED COMMUNITIES

***Abstract.** Information and communication technologies (ICT) have been largely used in the future oriented consultations (foresight) in the last years. The emergence of the community oriented web (web 2.0) opens a window of opportunity for a new generation of foresight exercises, with a higher interactivity, better focus of expertise, a larger use of Internet resources and, most important, an accumulative content development. The paper describes the framework architecture of a web 2.0 based platform for foresight and describes its properties in the perspective of cognitive psychology and evolutionary economics. The paper concludes that such platforms may represent the basis of future oriented communities able of developing complex databases of future trends related to complex systems.*

***Key words:** Online communities, web 2.0, foresight, Delphi method, evolutionary cognitive systems.*

JEL Classification: O33, Z13

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SUPERVISED PATTERN RECOGNITION WITH POTENTIAL FUNCTIONS METHOD

***Abstract.** In this paper, the potential functions method is analyzed, as (nonlinear) supervised pattern recognition method. In this context, the theoretical fundamentals of the potential functions are analyzed, the constructing modality is described and the physical nature of these functions is explained. The classification criterion based on the potential functions method is defined and the practical modality of using the potential functions, for supervised pattern recognition is illustrated.*

***Keywords:** supervised pattern recognition, discriminant analysis, artificial intelligence, potential functions.*

JEL Classification: C45, C65, C87