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NONLINEAR PROBLEMS IN ECONOMIC DEVELOPMENT

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Abstract

Now, we attend to the beginning of a process of synthesis among the developmental economic theories and the new theory to the complexity.

Mathematics, the science of spatial forms and quantitative relations, is considered to be the basis of all other sciences. In the analyses dynamics macroeconomic area we can observe a big variety of method and techniques for research fluctuates from economy and financial date. Because a lot of economical models were elaborated in last years, in this article we propose to present some nonlinear techniques which can be used in economic analyses. For example, a complex way for evidence the economic cycles is to determine limits cycles for the dynamical system which model the economic phenomenon.

Keywords: complexity, nonlinear theory, economic evolution, equilibrium

1. The Economic Development Problem

The tasks that lay ahead the economist are so wide, contradictory and restrained that they reclaim more and more captious knowledge from other fields as well, especially concerning the modelling of economic phenomena, the use of the methods of mathematical research.

Economy, generally supposes consumers and producers, goods and services that they exchange, prices that establish the conditions of these exchanges, states of balance and fundamental problems determined by them (the existence of the balance, the uniqueness, the constancy or its establishment, the evolution in time). The use of mathematics for solving such economic problems sometimes determines profound and unjustified reticence, because, on one hand the mathematic device got complicated, fact that implies a major effort to know it, and on the other hand, the discoveries useful to economy are rather recent as timing. The economic science has made great progress in the latest years, but this progress is rather unknown maybe because the mathematic theory became extremely refined, requiring a continuous effort to be understood.

A new approach of the economic development outlined in the years '70, when all countries were facing countless difficulties, although great efforts were made for the industrialization. The realistic specialists in contemporary economic issues were forced to warn the public and the other economists about the fact that too many things were going badly, either in the sense that there was too much violence and too little economic reasoning [Kothari, (1974)], either in the sense that the development efforts of many hundred million people are annihilated due to certain "structural violence" [Galtung, (1980)], either in the sense that the excessive division of work and the exaggerated specialization in certain areas began to harden, even make inoperative, the actual economic mechanisms [Hawken, (1983)].

The economic dictionary defines the **economic development** as being a "form of manifestation of the macroeconomic dynamics which supposes, besides the economic growth of the countries, a set of quantitative, structural and qualitative transformations, both in economy, and in the scientific research, in people's way of thinking and behaving".

Development means, in the vision of J. Galtung (1980), the close connection between the existence ("to be") and the material welfare ("to have"); in the vision of H.Chenery, development supposes multiple modifications of the structure, and in the vision of the Bariloche Report, coordinated by A.O. Herrera, it means the satisfaction of the fundamental needs of all people, eliminating the shocking inequalities between people about their fortune and revenues.

Numerous specialists demonstrated that the obstacles in the way o development, of the dynamic balance and of the harmonization of various interests, are not only of material and technical nature, but also of social – political nature. They reached the conclusion that if mankind desires to survive, so not only to be richer and happier, then substantial changes must be made both regarding the objectives pursued and the methods used and the mechanisms through which they are put into action.

The economic development, besides the quantitative aspects, surprises the distribution of richness and of the revenue inside the society, the influence of the economic changes on the living level of the population, on the efficiency of using the economic resources, etc.

The multi-dimensionality of the concept of economic development is revealed by the following aspects:

- the economic development implies economic growth, because it cannot exist itself without a growth of the macroeconomic results on long term; still, in order to turn in economic development, the growth of the

macroeconomic results must be accompanied by qualitatively structural transformations in economy, in the way of living and in the quality of people's life;

- the economic development denotes, unlike the economic growth, new technical-economic economic – social reports that appear in the process of growth;
- the economic development may be defined in a restrained way as the development of the production factors, respectively of the main components of economy, like: the development of the material infrastructure, the optimization of the conditions of combining and using the production factors, etc;
- the notion of development refers not only to the changes of the reports between the economic agents in the production process, but also to the change of their behaviour toward environment and society. These changes of conception refer to the behaviour modifications on production, to the modification of the points of view concerning it.

The term of **economic growth** resumes this process in the economic thinking and preserves one of the most passionate and controversial issues of economic thinking of the post war period.

The economic development contains elements of success and failure. In general, the economists use the term of economic development in a broader sense, which incorporates institutional and cultural changes (Lewis). This way, the capitalistic and the socialist economic development exists. The classic economists (Smith, Malthus, Ricardo, Marx, Mill) are interested in the development of the social system, in one word in the economic development which corresponds to the economic evolution. In exchange, the economic growth corresponds to the expansion or balanced change of economy. The economic development is associated to the instabilities and stochastic behaviour, while the economic growth to the stability and balances expansion.

In conclusion, the economic development of a country distinguishes the set of transformations of quantitative and qualitative nature, appeared in the economic – social and scientific – technical structures as well as in the psychology and behaviour of the society as a whole.

The evolution of the economic thinking from the static microanalysis to the dynamic macroanalysis represented a real progress in the economic science. The vision about the economic movement of society began to get close more and more to the vision about the movement of the living organisms, the human society representing a complicated organisms in which they self propel.

2. Nonlinear Problems in Economy

2.1. The complexity sciences

In the real economy, at the level of the economic agent, of the branch or of the national economy, the activities can be followed, analyzed and optimized with the help of the modern methods approached in a unitary concept, systemic and strongly abstracted and mathematized.

The modern theories aim mainly at the economic balances, ever more complex and more interdependent. The systematic research of the economic evolutions show that, in the contemporary economy, the structural changes and the oscillations are the rule and not the exception, and the constant states generally become instable when certain parameters vary. Subsequently, economy evolves to economic cycles or to situations of chaos, imposing a complex study instead of the classic theories.

The apparition of some global, planetary problems, that influence the process of growth, of the development on national, zone or global scale, like the depletion of certain non regenerative natural sources, the structure of the population, the deterioration of the natural environment, the development of the technique, the problem of alimentation, the excessive urbanization, the economic under development, the political economy led to the investigation of the multiple theoretic problems and especially practical in the field of the evolutionary economy.

In general, the economic processes have by their inertial nature, a intrinsic continuity, the jumps being exceptions to the rule. But these jumps exist, generating discontinuities, their knowledge being necessary both as an intrinsic phenomenon but especially due to the propagated effects, since it is known that small perturbations, by amplification, may lead to big effects, sometimes catastrophic.

In the economic processes we encounter a series of relations of non linear type: the curve of request, the curve of offer, the average ratio of consume, the relations cost – produced quantity, GDP – its cyclic fluctuation, production – factors of production, revenues at budget – taxing rate (Laffer curve), the relative increase of unemployment – the rate of unemployment (Phillips curve), the request of a product on the market with the passing of time and the succession of the stages in the life of the product (launching, growth, maturing, stagnation or decline).

From the econometric point of view, the classic methods, based on continuity, linearity and stability proved to be inadequate, in order to be able to represent economic phenomena and processes with a higher degree of complexity. The researchers are compelled to follow these processes in a dynamic way, to study the changes of quantitative order which interfere between the economic variables involved as well as the results obtained with their help. Besides other characteristics, the mathematic models allow the introduction of a

isomorphism between the real and ideal economic system, represented by the model. With their help, the approach of the instable behaviours of the different non linear economic systems becomes possible this way, being underlined more often the fact that the linearity and stability actually represent particular cases of economic evolution.

If the traditional economic dynamic was based on the famous principle of correspondence of Samuelson, according to which small perturbations of the parameters in the system determine small changes of the variables, the new conception, which is dominant in the actual dynamic, considers that small changes of the parameters may lead to qualitative modifications of the dynamic behaviour. This way, the systems may become from stable instable, from deterministic, chaotic, from linear non linear.

The non linearity of the evolution of a number of quite many phenomena from physics, biology, ecology and economy led to the outline of certain modern sciences, structured in the last years, sciences that try to approach, to conceptualize and then to use a different face of reality, more fluctuant, more dynamic. These sciences are the result of the integration of certain models, theories and techniques of solving the system of non linear differential equations, of a change of perspective, from which often appear new starting points in the attempt to better understand the phenomena studied. If the models are adequate, then from the knowledge of their solutions we can deduce the behaviour of the modelled phenomena. Although it is said that each non linear model has its own theory, they also have common treats, unifying, the behaviour no matter how strange of their solutions having a correspondent in the aspect of the modelled phenomenon. The fact that this behaviour was not yet signalled, is due to the complexity of the non linear problems, whose systematic study began only a few decades ago.

The complexity appears due to the large number of such element that interact **simultaneously**.

The complexity appears in the organization of the whole under the pressure of the infinite combinations in which they may interact.

It is obvious that the definitions evolve gradually in order to suggest that, to get the essence of complexity, the classic methodology of study cannot be used, which supposes the fragmentation of the whole and the study of the parts this way isolated. From this perspective, the science of complexity is, first of all, another way of rationally approach Reality, another way to build an ontological vision of the universe to be able to catch non linear phenomena, singularities, synergies, evolutions.

“It can be said that the component elements are simple, and their interaction law is at the same time simple. The complexity appears due to the increased number of such elements which interact simultaneously. The complexity appears in the organization of the whole under the pressure of the infinite combinations in which they can interact”.

“In order to understand the behaviour of a complex system, we must understand not only the evolution of the parts, but also the way in which they generate, by interacting, the whole itself”.

It is however interesting the definition of the word **hazard**, which in the same dictionary is “*an event that depends on its causes, so as an insignificant difference in causes may produce a considerable difference in effects*”. With other words, hazard defines a category of events whose “sensitivity to the initial conditions” is big, fact that makes the prediction to be difficult from the principle point of view. Now matter how hard we tried to control the initial conditions, something will exist: a small fluctuation, a drop, a friction, a local interaction and the non repetitive which will make impossible the identical repetition of an experiment. There are not practically two initial situations identical.

Although it gets close to “20 years of existence” (1987 – Santa Fe) **the science of complexity** in not perceived at its real value, neither as scientific importance, nor as pragmatic opening. Why?

A possible cause is the fact that requires from those who approach the field of complexity a change of the perspective from which reality is “looked at”, a “holist” approach (global, contextual, integral), different from the “reductionist” one specific to the actual paradigm. In another way, it is not only the novelty of “information”, of the object itself (fractal geometry, the theory of chaos, synergetic, genetic algorithms, etc) but also of the perspective from which they have to be looked at, integrated and valorized.

The organization at the academic level of certain concepts, theories and new models, like: co-evolution, complex system, auto-organization, emergency, the theory of chaos, the theory of catastrophes, synergetic, fractal geometry, etc determined the frame and defined the perspective from which systems that evolve can be studied, modify unpredictably in report with the flux of information, energy and matter that crosses it: living systems (ecology, sociology, economy) or artificial systems based on artificial intelligence. The science of complexity is from this perspective a factor of inter-disciplinary coagulation of an intellectual environment capable to understand and help in a concrete manner the transition process from the industrial society to the informational one, respectively to the one based on knowledge (Knowledge Based Society – Lisbon 2000). Objects like: econo-physics or juris-dynamics are examples of the “cross-breeding” of the classic objects with the new set of concepts, techniques and methods delivered by the science of complexity.

The science of complexity, like any other science, has a well defined object of study, for which it elaborated methods and specific techniques of approach, pursuing the comprehension and use of phenomena, processes, properties and instructions that derive from these studies.

In a concrete way, the science of complexity deals with the study of complex systems and develops adequate techniques and models for the description of their behaviour in time and space.

The apparition and development without precedent of the Internet, the raise of the calculus power of the actual computers which can get to contain thousands of processors, the very rapid development of telecommunication, the apparition and continuous extension of the cyberspace and of the virtual systems, the passage to methods based on intelligent agents and others, determined a special interest for cybernetics and the theory of systems, the only ones capable to offer a systemic vision, integrative, on a world found in a dramatic process of complexification.

2.2. Some aspects of non-linearity

The scientific research of nature showed its complexity. The problem of a science of complexity was brought out in July 1991 in *Physics Today* by Philip Anderson, professor at Princeton University in the article “*Is Complexity Physics? It is a Science? What is it?*”. In time this science, of complexity, began to outline its object through new methods, others than the ones used so far. Among these are:

■ **The fractal geometry** studies forms with irregular aspects both in space and in time, with properties of auto-similarity and measurable in space with non entire dimension. Science begins where it can be measured, where a simple qualitative approach is no longer satisfactory, where a precise delimitation is required, in the limit of an error, determined and considered acceptable. And here begins the role of the fractal dimension which can distinguish through a number, the structure differences. What statistics cannot do, the fractal dimension can do up to a certain threshold. And together, the two ways of estimating such a complicated profile allow special shadows.

The fractal may easily represent similar forces that act at more levels, offering a stocking method of images and data much more compact than the linear vectors, the irregularities becoming essential parts of the model. If the linear equations fail to build intrinsic, unpredictable and chaotic systems, then their accomplishment is possible with the help of fractals. All these advantages lead to the adoption of fractals in many fields like meteorology, seismology, cardiology but also economy.

Few people know that Benoit Mandelbrot, based his fractal geometry basing himself especially on the successful simulation of the tendency of the prices of the consume goods. This way, his simulations from 1953 on the price of the cotton continue to exactly predict the variation quantity from the price of the cotton, both monthly and yearly. Mandelbrot proposes in 1973 the modelling of the stock evolutions with the help of a distribution not used so far in economy: the stable paretian distribution. It was proved that this distribution reflects very well the real distribution of daily variations on periods of five years (1900 – 1905) and of fourteen years (1944 – 1958), and of the monthly variations for a period of 60 years. Due to this model, he managed to distinguish a regularity inside a irregularity. This model allowed the tracing of certain fictive stock evolutions amazingly resembling to the real ones. They seem so real that “experts could not differentiate them from the real ones. Some adventured to make, starting from fictive emissions, a series of complex comments and previsions” [3].

The studies of fractal geometry distinguished new properties of the natural objects and marked the main differences between them and artefacts. Besides a better modelling, the fractal approach allowed the identification of the importance of the recursive processes in the modelling of the nature phenomena and in generating structures with an extremely complicated aspect though very simple mechanisms. This way, this analysis has pragmatic implications in fields like: telecommunication (fractal antenna, fractal compressions in the mobile telephony), biology (the quantitative evaluation of tumours, the study of the processes of morphogenesis, the operative evaluation of the state of health) but also in economy (the diagnosis of stability at macroeconomic scale, the diagnosis of certain economic processes, the fractal market).

■ **The chaos theory** studies the dynamic of complex systems and introduces a new methodology of investigation and new concepts (transition sceneries to chaos, strange attractors, etc).

Toward the end of the 60ies the mathematician James Yorke gave for the first time the term “chaos” a mathematic status and meaning. The theory of chaos addresses, like the theory of ctstrophes, to the mathematic contribution of the science of dynamic systems. There is a big number of applications of the theory of chaos in economy. We give as examples the models of Benhabib and Day (1981, 1982), Benhabib and Nishimura (1985), Grandmont (1985, 1986), Day (1982, 1983), Stutzer (1980), Deneckereand and Pelican (1986), Baldrin and Montrocchio (1982), Stacey (1993).

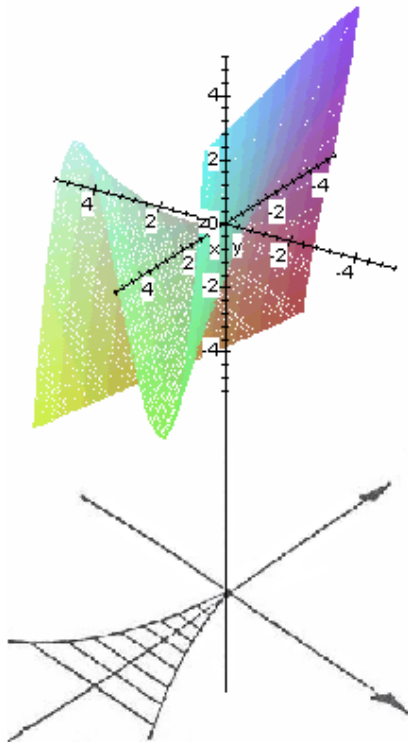
In his model, Stacey considers that the dependence between the current profit π_t and the previous one π_{t-1} is not linear because the raise of expenses generates a raise of the profit only in certain limits, taking into consideration the law of the decreasing efficaciousness, generally valid in economy. The dependency relation

between the current profit and the previous one has the form $\pi_{t+1} = A\pi_t - B\pi_t^2$. The non linear term is introduced to show that if the profit raises too much, its limitation will appear, given by the negative values generated by $-B\pi_t^2$. Stacey demonstrated that for $A < 1$ the company will register a raising profit while t is growing. For $1 < A < 3$ the model is stable, the trajectories tending to the balance point $\pi^* = 1/3$ (attractor). In exchange, for $A \geq 3.57$ a chaotic trajectory is obtained, any modification of the initial condition, even a slight variation of it, determining an evolution trajectory totally different from the initial one.

■ **The catastrophes theory** approaches the study of the critical states, of singularities, through the construction of a model that allows the comprehension and the analysis of the phenomena that happen in nature. This theory may be regarded as one of the possible solutions for surpassing the dilemma connected to the modelling of certain non linear dynamics, non conform to the theory of the continuous functions and to other theories based on continuity hypothesis, balance and stability of the optimum solutions. It resorts to this theory in order to solve problems that cannot be approached in a traditional manner.

The theory of catastrophe was introduced by Rene Thom in 1972 and popularized by Zeeman in 1976. It supposes the establishment of the multitude of points in which the considered functions have critical points, operation that takes place in the space of the phases and the establishment of the multitude of points in which they have singularities, operation that takes place in the space of parameters, also known under the name of control space.

In [4] is considered a company that produces x household objects, which it sells at the price p on a market with perfect competition. The total cost is $C(x) = x^3 + ax^2 + bx + c$ and using the change of coordinate $y = x + \frac{a}{3}$, and marking $\alpha = 3r^2 + 2ar + b$, $\beta = r^3 + ar^2 + br + c$ where $r = -a/3$ can be written $C(y) = y^3 + \alpha y + \beta$. The total revenue is py and the profit function has the expression of $\pi(y) = -y^3 - \alpha y - \beta$. As the maximization of the profit is not affected by β , by resorting to a translation the profit may be written as $f(x, p - \alpha) = \pi(x) + \beta = -x^3 + (p - \alpha)x$. Supposing that both the technical production and the cost conditions remain unaltered, that is α and β are constant the only relevant parameter is the price p which raises or



decreases as a response to the request conditions, respectively offer of the considered economic branch, conditions on which the producing company does not hold control. This way, f can be considered a potential function that can be brought at the standard canonical form from the theory of catastrophes. Equalizing with zero the first derivate we obtain $f'(x) = -3x^2 + p - \alpha = 0$ which in the space of phases, bi-dimensionally, (coordinates x and $p - \alpha$) represents a parabola, is the multitude of the critical points of this catastrophe. Further on, equalizing with zero the second derivate too, ($f'' = -6x = 0$) and eliminating the coordinate x between the two equations, the equation $p - \alpha = 0$ is obtained, which in the uni-dimensional space of parameters (which has only one coordinate $p - \alpha$) represents a single point only, the origin, the only point of ramification of the fold catastrophe. The critic output is $x = \pm \sqrt{\frac{p - \alpha}{3}}$. So, the equation $f'(x) = -3x^2 + p - \alpha = 0$ does not admit real roots for $p - \alpha < 0$ and has two real roots corresponding to the maximum and minimum for $p - \alpha > 0$ (figure 1).

The maximization of the profit may tend to the maximum in the branch when p varies. The price may decrease, according to the output x . The company may eventually lose but continue to produce until it passes over the maximum point, and at origin where the maximum and the minimum unify, at $p - \alpha = 0$ and $x = 0$, a jump takes place which leads to a dropping of the price. According to the initial conditions, this way an eventual bankruptcy of the company can be foreseen.

So, the conditions for the maximization of the profit are simple: $p - \alpha > 0$, and the quantity that has to be produced is $x^* = \sqrt{\frac{p - \alpha}{3}}$. This issue was presented as a static issue of optimization but it can be made explicit

and dynamic by considering the gradient function $\dot{x} = \nabla f(x, \dots) = -x^3 + (p - \alpha)x$ that is the output pursues the maximization direction of the profit.

■ **The bifurcation theory** was crystallized in the years '70 as a consequence of the accumulation of a great number of results in the non linear functional analysis, on one hand, and in the differential topology, on the other. The unification of all these results allowed the distinguishing of principles, of the fundamentals of the theory of bifurcation. Developed in more contexts, in the beginning preponderantly applicative, concrete, in the theory of bifurcation many concepts and results were formulated, sometimes difficult to be harmonized and thus unified. Different authors use different concepts of bifurcation and this thing began to be felt also in the studies of economic mathematics. Most notions in the theory of bifurcation suppose the knowledge of a very advanced mathematic device.

The theory of bifurcation studies the topological and differential changes, named bifurcations, of the non linear applications in certain singular points named bifurcation points. It was imposed following the ascertaining that, due to non linearity, the mathematic models of particular sciences, the presence of the bifurcation is the rule and not the exception. On the other hand the existence of more attractors for the same value of the parameter lead to the explication of many paradoxes of these sciences, imposing another sense to the notions of solving and solution of an equation, contributing to the formation of the paradigm of complexity.

The classic studies on the equations that used to model phenomena of the material world, referred to a certain solution of the equation, corresponding to a single point on the bifurcation diagram, or only to studied solutions, in that diagram, on a single branch, stopping in front of the bifurcation points. Through this, the phenomenon governed by that equation was not studied in its totality, but only for the physical situations corresponding to the positioning in a point or on a branch of the bifurcation diagram. This lead many times to contradictions between theory and experiment. The theory of bifurcation eliminates these shortcomings through a global study, complete and detailed of the bifurcation diagram.

In [5] we considered a model that supposes a Cauchy problem for a system of two ordinary differential equations of first order in real field. It describes the evolution of the capital of a company and of the work force implied.

Let K_t be the capital at t moment and L_t the volume of the work force (number of persons employed). Then the company has the business number y_t given by the production function $y_t = F(K_t, L_t)$.

The evolution of the capital is according to the development politic of the company, by the share part of revenues destined to investments, $(1 - \delta_t)\pi_t$, where π_t is the net profit realized in the year t , profit that may be allocated entirely to development or only partially, and that is the part remained after covering the dividends to the shareholders of the company, in a part of δ_t . Subsequently, $\delta_t\pi_t$ is the mass of dividends and $(1 - \delta_t)\pi_t$ is the remained volume for investments. Taking into account the depreciation of the capital with the average coefficient μ_t and the revenues obtained from the liquidation of the damped actives, at the recovery cost of λ_t the mathematic model of the development of a company is obtained, by using the basic equation of the evolution of the capital and considering the production function of the type Cobb-Douglas with raising efficaciousness:

$$\begin{cases} \dot{K} = A\gamma_t(1 - \delta_t)K^2L - \mu_t(1 - \lambda_t)K, \\ \dot{L} = \alpha_1K + \alpha_2L - \alpha_0. \end{cases}$$

In this system K and $L : \mathbb{R} \rightarrow \mathbb{R}$ are unknown functions which depend on the independent variable t (time). By transformations of coordinates the considered system is equivalent to:

$$\begin{cases} \dot{x} = cx^2y + bx, \\ \dot{y} = x + \alpha_2y - 1, \end{cases}$$

In the equations only remained three parameters, b , c and α_2 . This reduction has as economic consequence the distinguishing of certain expressions, functions of primary economic parameters, which interfere in the evolution of the capital and of the work force inside a company (figure 2). This way, the same value of a new parameter corresponds to a great diversity of values of the old economic parameters, being formed in this manner classes of equivalent economic situations.

In [6] it is shown that for certain values of the parameters, this model admits a limit cycle, so a periodic evolution in time distinguishes for the two variables considered.

The behaviour of the non linear system is given in the figure below, where it can be noticed both the variation of the work force reported to the capital, their variation in time, as their tri-dimensional evolution.

It is demonstrated that locally, the parametric portrait around the balance (1,0) for the non linear system is topologically equivalent to those around the origin for the linear system, even if this balance is non hyperbolic. In [6] we demonstrate that this balance point in neither of the type Hopf nor of the type Bautin, and that the

possible non resonant terms, which may lead to the topological non equivalence between the linear case and the non linear one, are strictly of higher degree than six.

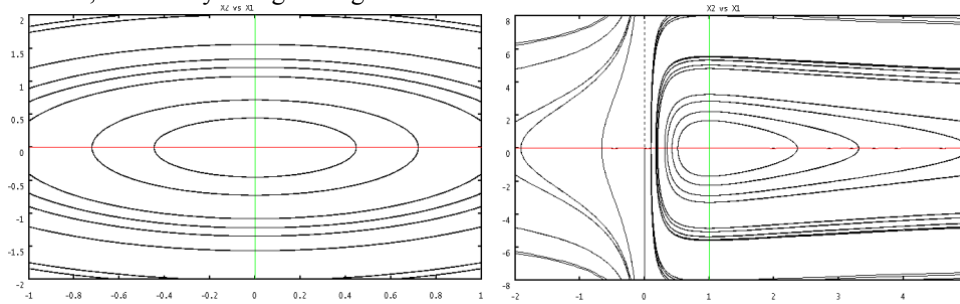


Figure 2. Phase portraits for a) linear case b) non-linear case.

From the economic point of view it may be followed the variation of the capital K and of the work force L in time, starting from significant initial data corresponding to certain points from the space of parameters. This way, there are situations in which the considered system admits a periodical solution which corresponds to a cyclic economic evolution. It can be distinguished both the negative phenomena like the lowering of production and the raise of unemployment, as well as the positive ones, characterized by the modernization of the production capacities which can determine both the increase of the request of consume goods and the determination of the degree of occupation of the work force.

3. Conclusion

The study of such systems, started with studies made by researchers in the field of mathematics and natural sciences, lead to the development of certain concepts and methods fundamentally new. Although their application in the economic science is still in the beginning, some remarkable results have already been obtained of great interest for economists. There are numerous fields and economic contexts in which the non linear techniques are extremely useful, like the behaviour of the capital markets and of the exchange rate, the problems of the external debt, the economic depressions, the hyperinflation and the banking risk, the estimation of the natural rate of unemployment, evolutions of capital or of the work force.

So, there is a theoretic-practical finality only by using certain modern and performant methods, of analysis of the non linear dynamic systems, capable to surprise the essence of the phenomena and economic processes researched, to realistically evaluate the dimensions and the tendencies of their evolution in the future.

We can say that the paradigm of complexity is able to offer the conceptual frame in which they can project, evaluate and coordinate processes specific to the living world (biology and environment, sociology and economy), respectively the processes governed by artificial intelligence (ingredient more and more used in informatics). We can state that this paradigm is essentially connected and even conditions the accomplishment of the objectives traced through the document from Lisbon 2000 regarding the structuring in Europe of the economy based on Knowledge, form of organization superior to the Industrial one (the industrial society) or to the Informational one (the Informational society) and which may assure a durable development of man on Earth.

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THE IMPACT OF THE NEW FINANCIAL PRODUCTS ON THE VOLATILITY OF THE ECONOMIC GROWTH

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Abstract

The derivative financial products, the result of the financial innovation process undertaken during the last decades, have a priori an important role in the continuous financing of the economy and in the diversification of the risks. Consequently, these financial instruments have to enable, beyond their speculative character, a reduction of the volatility of the economic and financial activity. Looking at derivatives from the perspective of physiology rather than pathology, we have analyzed the impact the use of these products has upon the economic volatility in four European countries whose financial markets are members of the Euronext stock-exchange market and we discovered a positive relationship between the amount of the transacted contracts and the reduction of the volatility of the macroeconomic activity. We have previously calculated the reduction of the volatility of the economic activity in the analyzed countries in the period 1988-2006, based on two different methods: the evolution of the standard deviation and the evolution of the contribution of the components to the volatility of an aggregate. The contributions of this article are, on one hand, the use of a more detailed analysis method for the reduction of the volatility, and, on the other hand, the testing of the relationship between the volatility of the real GDP, investments and commercial exchanges and the use of the derivative products. The results have to be interpreted with caution due to the assumptions taken into consideration because of the lack of complex statistic data.

Keywords: financial innovations, derivative products, volatility of the economic activity.

1. Introduction

The economic literature analyzing the reduction of the volatility of the economic cycle is split in two main categories. A first part analyzes the factors that contribute to the reduction of the economic activity and is mainly centered on the economy of the United States, and the second part focuses on the relationship between the economic and financial integration and its impact upon the volatility. Our study which is in line with the first series of analysis is based on the study of the recent situation in the countries whose financial markets are members of Euronext (except for Portugal) and compares two recent periods: 1988 – 1999 and 2000 – 2006. After performing the analysis, we observed that the volatility of the investments and that of the commercial exchanges is much more important than the volatility of the consumption and consequently we have to insist upon the analysis of the factors which contribute to the reduction of the volatility of the first two elements mentioned above. The relationship between the use of the derivative products and the reduction of the macroeconomic volatility has not been analyzed from an empirical point of view. Unlike the other studies which analyze the reduction of the volatility by calculating the standard deviation, we tried to carry out a sensitivity analysis to see which of the real GDP components contributes the most to its volatility. The structure of the article is as follows: the first part presents theoretical aspects related to factors that contribute to the reduction of the macroeconomic volatility as well as the trends observed in the analyzed countries, and the second part presents the results of the econometric tests and, finally, the findings.

2. Explaining the Decline in the Volatility of Growth

In theory, the factors that contribute to the reduction of the macroeconomic volatility present a diverse nature. One of the factors is represented by the reduction of the shocks on the demand and on the supply [Gordon, (2005)]. Blanchard and Simon (2001) consider as main factors for the reduction of the volatility of the economic activity a reduction of the volatility of the governmental expenses, of the investments and also a reduction of the inflation.

Another factor is represented by the technological progresses, particularly in the area of the informational technology. An easier access to the information enabled the investors to establish medium and long term strategies, contributing thus to the reduction of the fluctuations [Stiroh, (2006)]. The techniques used for stocks' management stand for one of the most common elements that contribute to the reduction of the volatility of the economic activity. The stocks management reduces the volatility of the production [Taylor, (2000)].

The financial reforms and the fiscal policy represent other elements proposed by Arias *et al.* (2006). The monetary policy is also considered a foreground element which contributed to the reduction of the macroeconomic volatility [Gordon, (2005)]. There are also opinions opposed to this point of view: Boivin and

Giannoni (2006) assert that the reduction of the volatility of the real GDP in the United States was accompanied by the alteration of the mechanisms used for the propagation of the monetary policy.

The modification of the economy's structural composition contributes to the reduction of the volatility of the economic activity. The services sector, which developed progressively, is less volatile than the industrial or agricultural sector. This factor was promoted by Stiroh (2006).

Kose *et al.* (2003) underline the impact of the international financial integration on the economic volatility. Their study was carried out on an extended group of industrialized countries and the results demonstrate that a weak commercial integration exposes more of the studied countries to the shocks on the external demand. De Souza (2004) considers that free commercial exchanges between the countries in Central and Eastern Europe led to the reduction of the volatility of the economic activity.

Arias *et al.* (2006) show that the volatility of the economic cycle in the United States diminished starting with 1983 due to the reduction of the shocks on the productivity. Stiroh (2006) shares the same opinion, adding to the reduction factors the increase of the labour market's flexibility and the reduction of the volatility of the capital. In fact, in respect of the last mentioned factor, it is about the access to the capital, access facilitated by the financial innovation process.

The factor financial innovation represents in its turn a potential source for the reduction of the shocks on the economic activity, contributing to the reduction of its volatility. Akhaveim *et al.* (2001) have analyzed the impact of the use the banks do of the scoring for the credits upon the productivity and upon the reduction of the volatility of the investments. Moreover, Jerman and Quadrini (2006) consider the innovation and the development of the financial markets as elements contributing to the reduction of the volatility of the production activity. These authors observed that the volatility of the financial activity increased with the reduction of the volatility of the economic activity.

Equally, Stock and Watson (2003) considered the reduction of the volatility as a result of the "good luck", as they believe that neither of these elements can justify the reduction of the volatility of the production.

In respect of the empirical studies, the results of the analysis are different and rather ambiguous. While Rincon (2007) does not find a positive and significant relationship between the globalization and the reduction of the volatility, Prasard *et al.* (2004) discover a significant relationship but in the context of a "better quality of the governance" of the authorities. On one hand, De Souza (2004) finds a positive relation between the degree of economical integration and the reduction of the volatility, and on the other hand Buch (2005) discovers that the volatility of the GDP is more important in the open economies¹.

Rose and Spiegel (2007) consider that the proximity to major international financial centers (New York, Londra and Tokyo) contributes to the reduction of the volatility of the production and consumption. In the opinion of Bekaert *et al.* (2006), the fact that the financial markets and the capital account are now open for foreign investors, represents an important factor for the reduction of the volatility. Using a theoretical model to demonstrate the reduction of the volatility, after simulations, the authors observe that the countries with a free capital account have in average a volatility of the consumption smaller with 2% as compared to the closed economies. The authors used the following control variables: the life expectancy, the demographic growth or the ratio between the governmental consumption and the GDP, considering that the volatility is smaller for countries applying sophisticated macroeconomic policies.

In order to demonstrate the relationship between the structural changes and the reduction of the macroeconomic volatility, Kent *et al.* (2005) use the OLS method, for a regression with fixed effects on a panel of data. The measurement of the volatility is performed on five-year rolling window, for 20 OCDE countries, between the years 1970-2003. A reduction of the volatility appeared in 14 out of the 20 analyzed countries. The explicative variables taken into consideration were the financial liberalization, the volatility of the inflation and that of the fiscal policy.

Only Dynan *et al.* (2006) emphasize the process of financial innovation as the main factor for the reduction of the volatility of the economic activity in the United States. These authors test empirically the relation between the credit products and the reduction of the volatility of the economic cycle. The financial innovations led, according to their opinion, to the increase of the capacity of the households and enterprises to borrow funds, reducing thus the volatility of the consumption and of the investments. The financial innovations have been sustained in this direction by the improvement of the methods used for risks' management, by the governmental policies or by the attitude towards the credit process. In their study this authors approached the term of financial innovation in a broad sense [Wachter, (2006)]. They analyzed the impact of the innovation on the reduction of the consumption's volatility, or, as we have already stated, the investments are those proving the highest volatility.

As mentioned above, most of the studies focus on the economy of the United States and the evolution of the economic volatility during the last two decades is compared with the evolution of the volatility between

¹ Obviously, the results are influenced by the chosen samples and by the used analysis methods, but the results do not prove the existence of a general phenomenon.

1960s – 1970’s. As a method for the calculation of the reduction of the volatility, the standard deviation is used for a rolling window of five years. In our study, we use the same method in the first step, but we diminish this window at two years (eight quarters) and we consider that the standard deviation of an interval corresponds to the quarter situated in the middle of this interval. The reduction of the interval used for the calculation of the standard deviation was possible because we use quarterly data, seasonally adjusted, (Eurostat database), which do not present cyclical fluctuations on short term, and also because we keep the same rolling window method². Moreover, this method enables us to observe if the use of the derivative products in a certain quarter will result in the reduction of the volatility of the investments and of the commercial exchanges in the following quarters. The evolution of the volatility, calculated based on the standard deviation for the United Kingdom, Netherlands, France and Belgium, is shown in Figure 1.

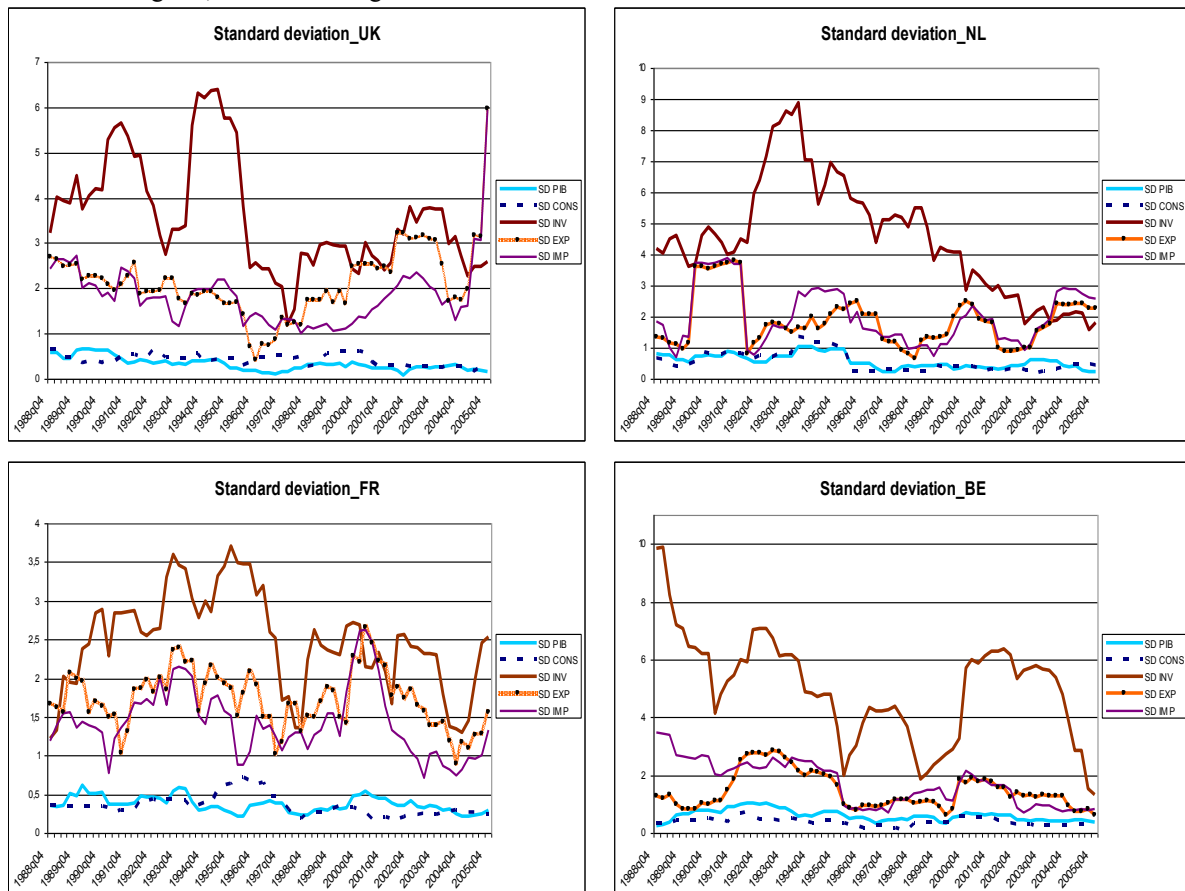


Figure 1. The evolution of the volatility, calculated based on the standard deviation for the United Kingdom, Netherlands, France and Belgium

In the figure above, it can be observed that in all the countries, the investments, the exports and the imports show the highest volatility, but this volatility tends to decrease. In the analyzed countries, the volatility of the GDP corresponding to the two periods is shown in Table 1.

Table 1. Standard Deviation of the real GDP and of its components for the periods 1988 – 1999 and 2000 – 2006

Standard Deviation Period	GDP		CONS		INV		EXPNET	
	1988-1999	2000-2006	1988-1999	2000-2006	1988-1999	2000-2006	1988-1999	2000-2006
United Kingdom	1,66	0,72	1,14	0,78	1,51	0,70	1,28	0,63
Netherlands	1,55	1,35	1,04	0,78	1,82	1,07	1,21	0,77
France	1,50	1,06	0,69	0,37	1,32	0,90	0,61	0,49
Belgium	1,67	1,29	0,88	0,78	1,46	1,36	1,19	0,97

² For example, the standard deviation for the “window” (t : t+7) corresponds to the “t+3” quarter and the deviation corresponding to the quarter t+4 will be calculated based on the interval (t+1: t+8).

The phenomenon of macroeconomical volatility reduction is also observed in the other countries in Western Europe. These countries could not be included in the analysis due to the fact that the data about the use of the derivative products are missing.

Firstly, if we compare the two periods, we observe that the volatility tends to diminish, and secondly, the trade of derivative products³ on the Euronext exchange⁴ presents a pronounced increasing trend – Figure 2:

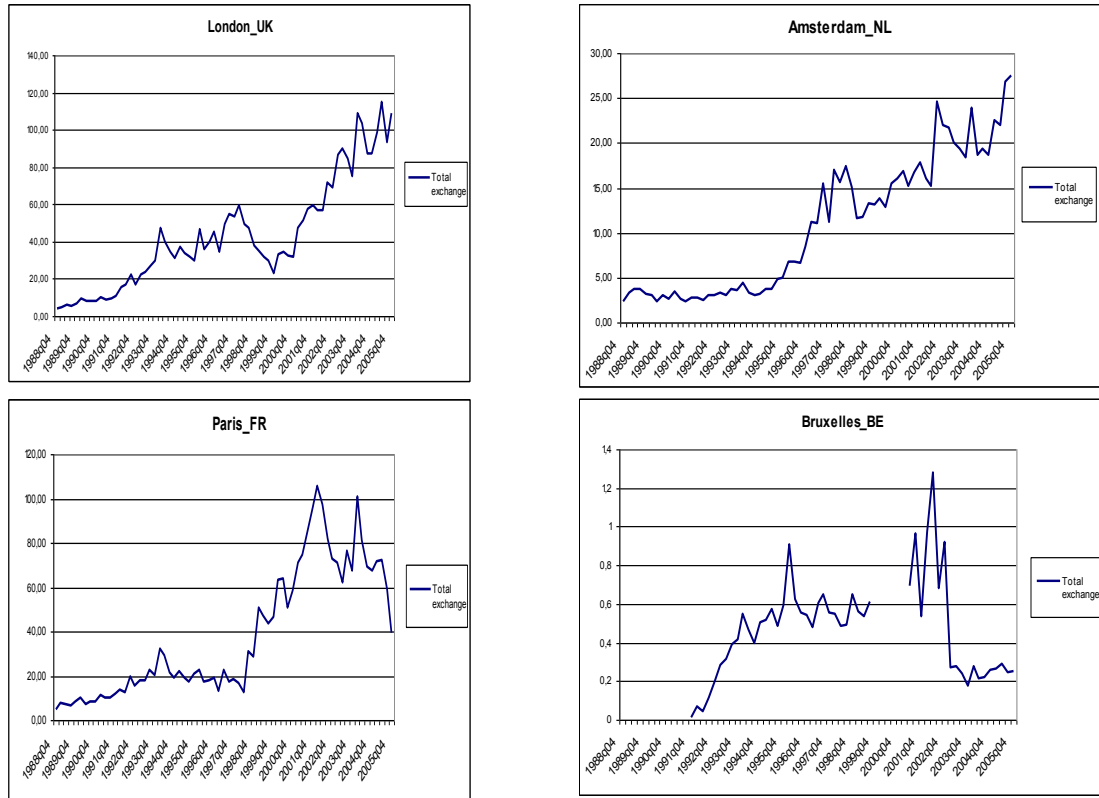


Figure 2. The Evolution of the no. of contracts⁵ with derivative products traded on the Euronext stock-exchange

In the next section we present the results of the econometric tests made on the panel data for these countries. Before proceeding to this analysis, we shall present a method that enables us to perform a finer analysis of the reduction of the volatility, namely to calculate the contributions to the volatility. We want to see if the contribution to the volatility also tends to reduce in case of the investments and of the commercial exchanges. Thus, we analyze the method of Chanut and Laroque (1979) – Box 1.

Box 1. The calculation method for the contribution of the components of an aggregate to its volatility

We study on T quarters, $t = 1, \dots, T$, the evolution of an aggregate $A(t)$ and of its “ m ” components $C_i(t)$,

³ The derivatives fall under two main groups: forward contracts which include future, swap and forward and options contracts. For example, a swap is an agreement between two parties in relation with the exchange of a cash-flow at a certain moment, at a price that will be established by the market at that specific moment. In this case, the exchange is compulsory. On the contrary, an option represents the right to sell or to buy an underlying asset at a price that will be established by the market at a future date. The holder of an option can always choose not to exert his right.

⁴ After the fusion of the markets, a series of contracts is traded only in London and Amsterdam, a fact which determined an increase of the number of contracts on these markets and their diminution, starting with 2002, on the Paris and Brussels exchange markets. However, the general increasing trend that can be observed is much more important. Euronext includes also the Lisbon stock-exchange, but we did not include Portugal in the analysis due to the special situation in this country (lack of data for the interval 1988-1994 and an excessive volatility caused by the budgetary conditions).

⁵ Taking into consideration the fact that the value of the contracts is relatively constant, the number of contracts is an appropriate indicator to measure the amount of the transactions.

where i varies from 1 to m :

$$A(t) = \sum_{i=1}^m Ci(t) \quad (1)$$

The growth rate of the aggregate is:

$$x(t) = \frac{[A(t) - A(t-1)]}{A(t-1)} \quad (2)$$

and the contributions $xi(t)$ of each component to this growth rate are defined by:

$$xi(t) = \frac{[Ci(t) - Ci(t-1)]}{A(t-1)} \quad (3), \text{ which implies}$$

$$x(t) = \sum_{i=1}^m xi(t), \text{ for } t=2, \dots, T \quad (4)$$

The model is the following (under the assumption of independence, we suppose that $[x_1(t), \dots, x_m(t), x(t)]$ represents the performance of a random stationary process of second order on date t . We note Ex_i , σ_{x_i} and $corr(x_i, x_j)$ represents the expected value of x_i , the standard deviation of x_i and the correlation factor between x_i and x_j . The result is :

$$x = \sum_{i=1}^m x_i \quad (5), \text{ which implies:}$$

$$E(x) = \sum_{i=1}^m Ex_i \quad (6) \text{ and}$$

$$\sigma_x = \sum corr(x, x_i) * \sigma_{x_i} \quad (7)$$

In (6) and (7), we replace the moments of the random variations for the associated empiric moments:

$$\bar{x}_i = \sum_{t=2}^T x_i(t) / T, \text{ for } Ex_i;$$

$$\bar{\sigma}_i = \sqrt{\sum_{t=2}^T [x_i(t) - \bar{x}_i]^2 / T}, \text{ for } \sigma_{x_i} \text{ și}$$

$$\sum_{t=2}^T [x_i(t) - \bar{x}_i][x(t) - \bar{x}] / T \bar{\sigma}_i, \text{ for } corr(x_i, x).$$

The growth contribution of the components will be:

$$GC_i = \frac{E(x_i)}{E(x)} \quad (8)$$

and the contribution of the components to the aggregate's volatility results from:

$$VC_i = \frac{corr(x_i, x) * \sigma_{x_i}}{\sigma_x} \quad (9)$$

This method enables the correction of the volatility of the extremely volatile components, depending on their share in the structure of the aggregate. The application of this method for the chosen group of countries leads to the results presented in Figure 3:

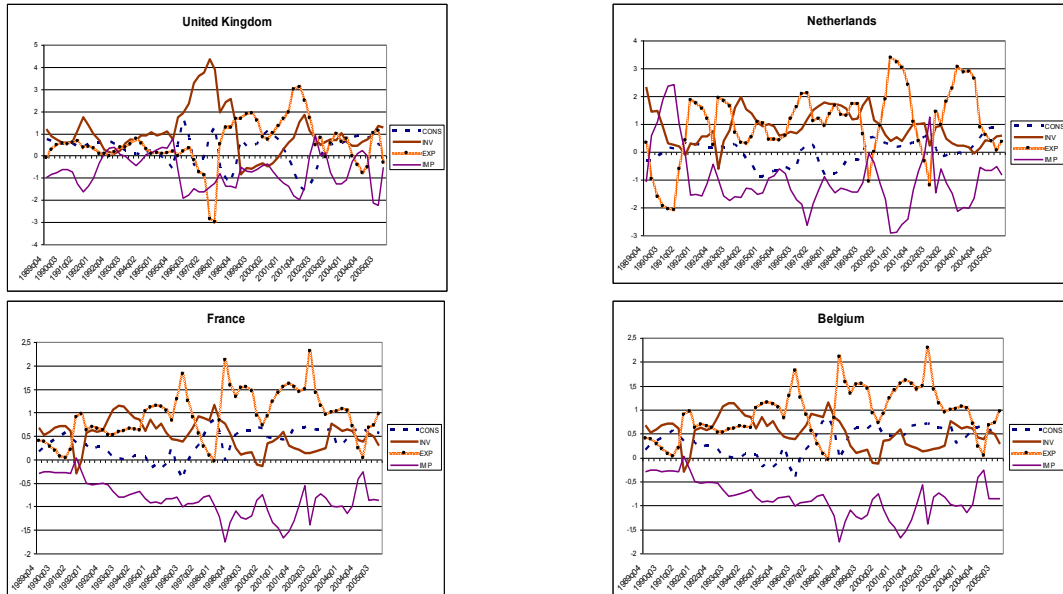


Figure 3. The evolution of the contribution of the real GDP components to its volatility

Analyzing the diagrams, we can say that, in relation with the real GDP, the contribution of the components to its volatility does not tend to decline in none of the analyzed countries. Using this method, the sum of the contributions to the volatility is always equal to 1, no matter the period. As we will see, the results of the econometric tests presented in the next section do not find a significant relationship between the use of the derivative products and the reduction of the contributions to the volatility. It can be observed that the investments and the commercial exchanges have the most important contribution to the volatility.

3. The Results of the Econometric Tests

Using a panel of data for the four countries taken into consideration, we performed two categories of regressions. The first category tests the relationship between the evolution of the standard deviation of the GDP, of the investments and of the commercial exchanges (the exports for exemple) and the amount of the traded derivative products, reflected by the number of contracts. The relationship between the volatility and the amount of the traded contracts is negative and significant, but no difference can be observed between the two periods (the coefficient of the introduced dummy variable is not significant), situation probably due to the considerable volatility of the economic activity after the crash of the stock-exchange occurred at the end of the year 2000. The control variables introduced are: domestic credit/GDP, the size of the real GDP and the stock-exchange capitalization/GDP. The second category of regressions tests the relationship between the contribution of the investments (gross fixed capital formation) and of the commercial exchanges (exports) to the volatility of the economic activity and to the amount of traded derivative products.

The results have to be interpreted carefully because the number of cross-sections is limited and we start from the assumption that the residents of a country effectuate most of the transactions on the national stock-exchange market (smaller direct costs related to transactions, a better knowledge of the market and of the regulations, etc.). Moreover, we only dispose of data corresponding to standardized markets.

The tested regressions are of the following type:

$$\text{Volatility}_i = c + \alpha X + \beta \text{dum} * X + \delta Z + \varepsilon_t, \text{ and}$$

$$\text{Contribution to the volatility}_j = c + \alpha X + \beta \text{dum} * X + \delta Z + \varepsilon_t, \text{ where:}$$

- the dependent variables i are represented by the standard deviation of the GDP [1], of the investments [2] and of the exports [3], and the dependent variables j are given by the contribution the investments [4] and the exports [5] have to the volatility; the explicative variable X , whose coefficient α is of special interest for us, represents the amount of the traded derivative products (deriv); the *dummy* variable acquires the value 1 in the period 2000-2006 and 0 for the other period; Z represents the vector of the control variables and ε_t represents the errors term.

As econometric methods, we have used the method of the ordinary least squares (OLS) as well as the method of the weighted least squares (WLS) but the findings are almost similar. The results of the two types of regressions (OLS method) are presented in Table 2 and 3.

Table 2. The derivative products and the macroeconomic volatility (panel regression)

OLS	1988 – 2006		
Volatility	[1] PIB SD	[2] INV SD	[3] EXP SD
c	0.969719***	3.896143***	1.494637***
deriv	-0.002543**	-0.015670**	-0.007332
dum_deriv	0.003192***	0.020008***	0.010975***
gdp_vol	-0.013458***	-0.080591***	0.006842
domcredit_gdp	-0.046469***	-0.355713***	0.048170
mkcap_gdp	-0.061496**	1.516011***	-0.015012
number of observations	225	225	225
R-squared	0.578322	0.474589	0.090971

Note. *, ** and ***, mean statistic relationship significant at 10%, 5% respectively 1% (t-statistic).

As it can be seen, the contribution of the use of the derivative products to the reduction of the volatility of the GDP and of the investments is significant. Equally, the control variables prove the fact that the relationship is robust: the big countries, with a more developed financial system, show a more reduced volatility. We can not state the same thing about the volatility of the exports. Moreover, it seems that the relation reached is weaker in the second period, as opposed to the initial assumptions (the sign of the *dummy* variable is positive and significant).

Table 3. The derivative products and the contribution to the volatility (panel regression)

OLS	1988 – 2006	
Contribution to the volatility	[4] INV VC	[5] EXP VC
c	0.656761***	-0.001618
deriv	-0.007203	0.019758***
dum_deriv	0.007383**	-0.011654***
gdp_vol	-0.735020***	-0.444265***
domcredit_gdp	-0.047442	0.026205
mkcap_gdp	0.008230	0.055895
number of observations	220	220
R-squared	0.569895	0.282295

Note. *, ** and ***, mean statistic relationship significant at 10%, 5% respectively 1% (t-statistic).

The insignificant results of the second category of regressions reflect the evolution of the contributions to the volatility, earlier explained by means of the descriptive statistics. Consequently, we can say that, even if the volatility of the investments and of the commercial exchanges tends to decline, their contribution to the volatility of the real GDP remains important.

4. Conclusion

After the performed analysis, we observed the fact that the volatility of the investments and of the commercial exchanges is much more important than the volatility of the consumption and consequently the accent has to fall on the analysis of the elements that influence these macroeconomic variables. We consider that the use of the derivative products can contribute to a better allocation of resources and to a better management of the risk, a fact which has a positive impact on the reduction of the volatility of the investments and of the commercial transactions.

In the present study we have analyzed two different methods to emphasize the reduction of the volatility. The second method for the evaluation of the contribution of the components to the aggregates' volatility represents a sensitivity analysis, being completely different as compared to the method for the calculation of the volatility based on the standard deviation.

The econometric results show a significant relation between the reduction of the volatility of the economic activity and the amount of the derivative products traded on the market. This relation is less significant in the second analyzed period and consequently the results have to be interpreted with reserves. The fact that the group of countries is reduced and that we start from the assumption that the resident investors perform most of the transactions on the national stock-exchange markets constitutes another limit for our study. Moreover, the statistics enable the analysis of the transactions with financial products traded on standardized markets (stock-exchange markets), or the most considerable amount of derivative products is traded *over-the-counter* (OTC).

The access to a data base that could enable the visualization of off-balance sheet banking data⁶ gives the opportunity to develop this analysis and to obtain more accurate results, a considerable part of the constraints being eliminated. The continuation of the study based on such data also enables the extension of the analysis over other countries.

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⁶ The trade of the derivative products represents the most important part of the off-balance sheet operations of the banks

FOREIGN DIRECT INVESTMENTS – RELAUNCHING FACTOR OF THE ROMANIAN ECONOMIC GROWTH

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Abstract

The modernization and the reorganization of the national economy with the investments help is a dynamic process, which assure the improvement of the fixed capital, the creation of one mobile and complex structure of production, the introduction of the most performant work methods and techniques. Investments are circulator of new, they always bring the change of the exist situation, the apparition of other elements than those who are previously known. Investments engage future, from where devolve the association characteristic of an important risk factor proper for any investitional process.

Key words: foreign direct investments, greenfield investments, brownfield investments.

1. Introduction

In the last years, Romania has become a more appealing target for an increasing number of foreign investors. After starting the EU accession procedure in 2000, and its accession in NATO in 2004, Romania positioned itself very firmly within the Euro – Atlantic zone, with all political, economical and military consequences deriving from it. The EU accession process is expected to end in 2007, when Romania is foreseen to obtain its EU membership.

For a better integration within the international economy, the restructuring and reform process of the Romanian economy requires significant foreign investment flows driven by the increasingly global character of production processes. This aspect, together with the already global character of trade, requires a new approach to the identification and distribution of resources. For all countries, a component of the development strategies and an essential instrument in the development of a strong and dynamic private sector is to attract foreign direct investment (FDI).

The FDI facilitates the indirect access to foreign markets through the complementary effect of the related technology and know-how implementation.

2. Evolution of the Foreign Direct Investment in Romania

In present, the foreign direct investments became the most important source of external financing for all the world countries, indifferent of their development level. This kind of investments prove to be a financing source more stabile and more used than investments portofolio even than bank advances, because are less affected by financial crisis.

Is necessary the characteristic feature identification to establish the foreign direct investments risk in different Romanian regions, from the view of risk factors influence and of evaluation methods.

So, we can distinguish:

- general factors, which act at national level and present specific form of manifestation at regional level (legislative and institutional frame, performances and economic structure, physical and business infrastructure etc.)

- characteristic factors at regional level (geographic position, local resources, access to majors ways of communications local culture, attitudes, availability for interregional and transborder cooperation).

The foreign investments attract is an important source of efficient reorganization of regions and, implicitly, of national economy, financial capital, efficient methods of management, commodity market assurance, ability to place an world and European market are some of benefits penetration of foreign capital.

To create an attractive environment for foreign investors we have acquainted with their criterions of risk evaluation to invest in Romanian regions who will must assure a correct usage of common funds fated to economic reorganization and to exploit efficient the created frame – legislative, institutional – to assure an attractive and stabile environment for foreign investors.

FDI differentiated by their contribution's development and renewal of economic assets in that country who receive FDI, are:

- **Greenfield**, investments in created and developed enterprises by or together with foreign investors, like investments started from zero;

- **Brownfield**, investments in enterprises taken integral or partial by foreign investors from cormorants, much more than 50 percent from tangible and intangible assets being realized after taking over;

▪ **Integral or partial taking over enterprises:** investments in enterprises taken integral or partial by foreign investors from cormorants, much more than 50 percent from tangible and intangible assets being realized before taking over.

The change of economic and politic system occurred in East – European zone, at the beginning of the 90's, opened an important potential market for FDI.

Majority of the economists estimated that, after an initial period, when external financing will be realized principally based on official security, the FDI flows and the other flows of particular capital will be principals ways to realize the external financing.

For many countries in transitions, the FDI flows are important, because are generating of external debt, but also because are perceptible as a sign of international growth trust to maintain the whole transition process.

For Romania, FDI represent not just a source of external financing, but also an economic growth, a way to accelerate the transition process, to create structural and qualitative mutations in economy and to contribute to putting to account the existing resources in country.

The Romanian comparative advantages in relation with the other East – European countries to attract foreign capital are:

- internal market admeasurement (the second like measure in Central and East Europe);
- cheap labour with a raised qualification level;
- facile access to natural resources;
- industrial development stage.

The instability of an institutional and legislative frame from many years strong affected the foreign investors:

▪ *direct*, through discouragement of the investments initiative in the conditions of preparing impossibilities of a business plan;

▪ *indirect*, through affection of the entire business climate and of the entire economic evolution, who became neattractive through the purchasing power decrease, investments reduction in economy etc.

The principal limit, both in FDI attraction and in economic evolution generally, was consist in absence of an industrial politics in period 1999 – 2002, who would established a series of priorities in the industrial branches and sectors development and would permitted an active politics to stimulate the economic activities based on qualitative criterions.

FDI volume has hit, from may 1990 untill December 2002, 4,68 billion dollars in a number of 60.410 enterprises with foreign participation.⁷

In period 1990 – 1991 FDI evaluate from 87,3 million USD in a total number of 1.427 trading companies to 129,2 million USD in 5.897 trading companies.⁸

In the year of 1992 was eliminated a series of distorsions from economy, began to function a part of the market economy institutions, and the governmental institutions (Ministry of Foreign Affairs) contribute at Romania active promotion to foreign countries, who opened a credible perspective to Romanian market and stimulated the FDI attraction.

As a result of this mutations, the volume of the foreign capital has doubled and hit 275 million USD in a number of 11.897 trading companies.

In the period of years 1991 – 1996 FDI level on inhabitant's head in Romania has growth at 9 \$ representing just 1% from gross internal product and a low level with 85 percent than region method.

Period 1997 – 2002 was labeled by an important growth of FDI flow in comparison with precedent period and with the group of those ten countries who was adhere in 2004, not but that the departure still remained quite raised.

The value of FDI flow was in 1997 from six times bigger than 1996, and in 1998 has doubled toward the level from precedent year. Year '98 was the first year when the value of FDI flow in Romania excel the limit of 2 billions dollars, after what in previously year the limit of 1 billion was excelled for the first time.

In 2004, Romania was manage to improve the comparative advantage mater the FDI flow, attracting over 50 % from FDI volume who was realized in the states of South – East Europe.

The absence of the functional market economy, the absence of political volition to create a transparent and stabile business environment, the chaotic tuning of fiscal stimulants who many investors (specially natural persons) utilized for the building of ghosts enterprises and tax evasion but also the absence of business opportunities because of the privatization process delay, determinate the removal of scope foreign investors. Besides, existing enough investmental attractions in Hungary, Czech Republic and Poland when the political volition in economic reforms ending and the fast ending of the transition process toward a market economy hasn't missing.

⁷ Bonciu, Florin, (2002), *Investițiile străine directe în România în contextul Europei Centrale și de Sud – Est*, Centrul Român de Politici Economici, Bucharest, <http://www.cerpe.ro>.

⁸ Reports collection of Trading companies with foreign participation on capital, period 1998 – 2002.

Romania receive from UE the statute of a functional market economy just at the country report from 2004 October, from one year after Bulgaria and 8 years after the top – ranking platoon from the Central Europe countries.

In absence of any priority sectors establish by the govern at economy level, every ministry consider his domain as the most important for the country economic growth. In these conditions investors was welcome in all sectors, but these opening without discernment bestud more distrust through this.

The legislative and institutional instability, the continues and unpredictable changes of the fiscality in the negative way, but also the underground resistance at changes of state’s structure and old mentalities of trading companies employers with stat majority capital corroborated with the absence of a real privatization offer, determinate investors, at the beginning of the 90’s, to reoriented them self to Greenfield investments in industries who use intensely work force or to setting up of mixed companies with local partners.

A study⁹ realized in 2005 point out that the net flow of FDI in Romania, in 2004 was leveled at 5.183 millions euro composed by:

- **Investors participation** at companies capital from Romania in value of 3.032 millions euro representing 58% from the FDI net flow. From that, the contribution in nature doesn’t excel 2 percents, that is 79 millions euro;

- **Reinvested profits** leveled at 1.452 millions euro (28% from net flows). In calculation of reinvested net profits it keeps account of net loss from 702,5 millions euro;

- **Net credit** received from the enterprises in witch was effectuated FDI from the shareholders in value of 699 millions euro representing 13% from net flows.

Generally, it can be observed that the values matter FDI differ depending on the source and methodology. So much in internal ground, but also in international ground, depending on the methodologies evolution, are making again gravels to different indicators among others like the FDI volume.

In the first years of transition, the total value of FDI was calculated and official communicated based on the dates from the Trade Registry being took in consideration only the subscribed capital. Then, after what the National Bank of Romania became a data source regarding FDI, the annual volumes was recalculated taking into account by those three components of Foreign Direct Investments. At the ending of the year 2004, the FDI stock from Romania was 15¹⁰ billions dollars, composed by direct investments representing 12 billions euro (80%) from the final stock and 3 billions euro, the net volume of the loans granted by the foreign shareholders. The net credits include short-term, medium term and long term loans witch foreign investors was giving them to Romanian enterprises directly or/and indirectly through intermediary enterprises.

The study shows that, from point of view of economic activities, the FDI majority is finding in mercery industry (46%), important percents being holded by the metallurgy (13%), foods, drinks and tobacco industry (7%) and means of transportation industry (6%).

Meaningful investments was contracted on trade (15%), financial intermediary (11%) and telecommunications (11%).

Table 1. FDI distribution on Romania economic sectors, 2004¹¹

Sector	Value [Euro]	Percent from total
Industry:	8101	53,9%
Mining	1225	8,1%
Mercery:	6876	45,7%
metallurgy	1981	13,2%
foods, drinks and tobacco	1109	7,4%
means of transportation	860	5,7%
cement, glass and ceramics	603	4,0%
wood inclusive furniture	507	3,4%
fabrics, leather goods	503	3,3%
electronic appliance	434	2,9%
processing oil, chemistry and plastic	387	2,6%
car buildings	274	1,8%
others	218	1,4%
Trade	2185	14,5%
Financial intermediary	1711	11,4%

⁹ Study realized in 2005 by National Bank of Romania and National Institute of Statistics on 6712 trading companies with foreign participation on capital, when 3170 with more than 50 employers.

¹⁰ Deutsche Bank record 16,3 billions USD for FDI stock from Romania at the ending of 2004.

¹¹ Source: *National Bank of Romania and National Institute of Statistics.*

Telecommunications and post office	1589	10,6%
Services	848	5,6%
Buildings	166	1,1%
Transport	160	1,1%
Hotels and restaurants	29	0,2%
Others	251	1,7%
Total	15040	100,0%

In spite of apparent meaningful potential, as well as created image by the local entrepreneurs, domains like fabrics and tourism was holded at the ending of year 2004 a reduced gravity in FDI structure on activity sectors. It became obvious that in absence of an acceptable infrastructure in matters of communications ways and accommodation units, tourism won't registered important foreign investments. Besides, the privatization process from tourism wasn't realized in a sufficient manner of transparence discouraging the foreign investors participation. In consequence, the accommodation units from traditional station on the littoral and from mountain space belong, preponderant, to those enterprises and Romanian natural persons who doesn't have sufficient capital for them rehabilitation. If add at this image that of a precarious racer and railway infrastructure, obtain the principals reasons of interest absence of foreign capital for the Romanian tourism development.

At 31 December 2005, National Bank of Romania and National Institute of Statistics realized the statistic research for the determination of FDI and effectuation of an analyses regarding FDI on principals branches of national economy, on development regions and source country.

Nets entries of FDI in year 2005 registered a level of 5213 millions euro and are structured as:

- *The participations of directs foreign investors* at social capital of enterprises direct investment from Romania in value of 2688 millions euro (51,6% from net flow of FDI). From this sum, 13 millions euro represent the contribution in nature, that who represent 0,2% from total net flow);

- *Net profit* reinvested who registered a level of 1164 millions euro (22,3% from net flow). In this determination has been took in consideration the net loss in value of 1169 millions euro, registered by the enterprises direct investment who ending the financial exercise 2005 with loss, sum with who the realized net profit was diminished by the profitable enterprises direct investment, but also the reinvested profit by these.

- *Net credit* received by the enterprises direct investment from the foreign direct investors, inclusive from the group, in total of 1361 millions euro, that who represent 26,1 % from FDI net flow.

FDI sales at the ending of 2005, resulting from the add of initial sales of FDI net flow, of value differences resulted from the reevaluations due to exchange rate and price modification, inclusive from the accounting retreats of value of some sales, registered the level 21.885 millions euro.

From foreign investors orientation point of view to economics branches FDI was localized, especially, in processing industry (37,3% from total), within this the most attractive for FDI being the metallurgy (8,21%), foods, drinks and tobacco industry (6,5%) and means of transport industry (5,1%).

Other activities who attract important FDI are retail and direct trade (15%), financial intermediary and assurance who include the banking and assurance activity and represent 14,5 % from FDI total and telecommunications (10,9%). It can be observed a weight still low, toward potential, of some domains as: fabrics, confection and leather goods industry (2,6%), inclusive hotels and restaurants (0,2% from FDI total).

From FDI type point of view, are distinguished the Greenfield investments, who represent 42,2 % from FDI sales at 31 December 2005, respective 9237 millions euro, the difference representing taking over enterprises.

Table 2. FDI assessment on principals economic activities on 31 December 2005
million euro

	Total		From what greenfield*:	
	Value	% from value	Value	% from ISD total
TOTAL:	21 885	100,0	9 237	42,2
Industry	10 689	48,8	2 846	13,0
Extractive industry	1 602	7,3	101	0,5
Processing industry, from what:	8 170	37,3	2 693	12,3
- metallurgy	1 791	8,2	186	0,8
- foods, drinks and tobacco	1 427	6,5	740	3,4
- means of transportation	1 112	5,1	407	1,9
- processing oil, chemistry products and plastic products	896	4,1	-2	0,0
- cement, glass and ceramics	704	3,2	76	0,3
- processing wood products, inclusive	615	2,8	294	1,3

furniture				
- fabrics, leather goods	575	2,6	462	2,1
- calculation technique, electrical appliance, radio-TV, communications	404	1,8	288	1,3
- cars and equipments	348	1,6	97	0,4
- other branches of processing industry	298	1,4	145	0,8
Electrical and thermal energy, gases and water	917	4,2	52	0,2
Trade	3 279	15,0	2 354	10,8
Financial intermediary and assurances	3 176	14,5	1 493	6,8
Telecommunications and post office	2 396	10,9	1 419	6,5
Services performed to enterprises**	1 679	7,7	831	3,8
Transports	289	1,3	107	0,5
Constructions	179	0,8	76	0,3
Hotels and restaurants	42	0,2	9	0,0
Other activities	156	0,8	102	0,5

*Contain Greenfield investments in enterprises with more than 50 employers, inclusive

**Immovable transactions, rents and activities of services performed to enterprises

From territorial point of view it can be observed the FDI reorientation especially to BUCHAREST – ILFOV (60,6%), other regions for development beneficiary of important FDI being the SOUTH – EAST region (8,4%), CENTER region (7,4%) and WEST region (6,8%).

Tabel 3. FDI assessment on development regions at 31 December 2005
million euro

	Value	Total % from TOTAL	From what greenfield: Value	% from ISD total
TOTAL from which:	21 885	100,0	9237	42,2
Bucharest	13 264	60,6	6456	29,5
South-East	1 838	8,4	212	1,0
Center	1 610	7,4	885	4,0
West	1 491	6,8	792	3,6
South	1 388	6,3	367	1,7
Nord-West	1 257	5,8	541	2,5
South-West	745	3,4	129	0,6
Nord-East	292	1,3	- 145	- 0,7

After the annual report for year 2006 realized by Romanian Agency for Foreign Investments observed that the FDI has reach the highest value beginning with the year 1990. FDI record in 2006 is due to a plus of confidence who Romania gain through stability and predictability of investitional climate, a competitive fiscal politics, low costs and qualified work force, but also to near adhesion to European Union, that who confer those who chose Romania for the implementation of capacities of production, access to European unique warranty of our country evolution, inclusive of perspectives who are offer by this to potential investors. Those who invest the capital in Romania are now conscious that once it became part from the big European family, exist a legislative stability, and the alignment to European Union standards will transform the investments who are effectuated in our country in European investments.

In one of the most recent studies effectuated by her experts, the impressive consulting agency Ernst & Young, consider Romania the most attractive destination for the investments from South – East Europe, in the conditions of a substantial improvement of foreign investors perception on this part of the old continent.

The same study named *South – East Europe Attractiveness Survey* betray the fact that exist necessary premises for the improvement of our country position as destination for investments in the next 3 years.

The improvement of business medium, the effects of introducing the unique quote for assessment and the positive attitude of foreign partners toward Romania manage at the attract of a volume of FDI in value of 9,1 billions euro in year 2006.

Record value from 2006 of 9,082 billions euro in development with 74,24 % comparative with the same period of the previous year (5,213 billions euro) include the value of 2,2 billions euro, representing the taking over by the Erste Bank of 36,8% from National Bank of Romania stocks.

The most important component of the FDI attracted by Romania was “capital sharing” (4098 millions euro representing 45,1% from the total volume of FDI) come-next-after “other capitals”, that is the loans gave by the mother company to affiliated structure from Romania (3029 millions euro representing 33,3% from the

total volume of FDI), and the component “reinvested profit” (1956 millions euro, representing 21,5% from FDI total volume).

Making an analysis of FDI annual flows, on 2000 – 2006 period, the year 2006 represent the absolute record regarding the FDI attracted by Romania (see diagram no. 1). In 2006, the accumulated volume of attracted FDI by Romania excel the limit of 30 billions euro, being registered a FDI stock of 31,130 billions euro.

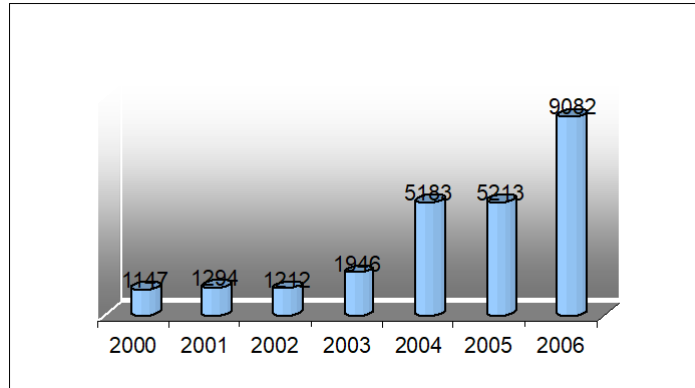


Diagram 1. FDI annual flows (million euro)

*Source: ARIS

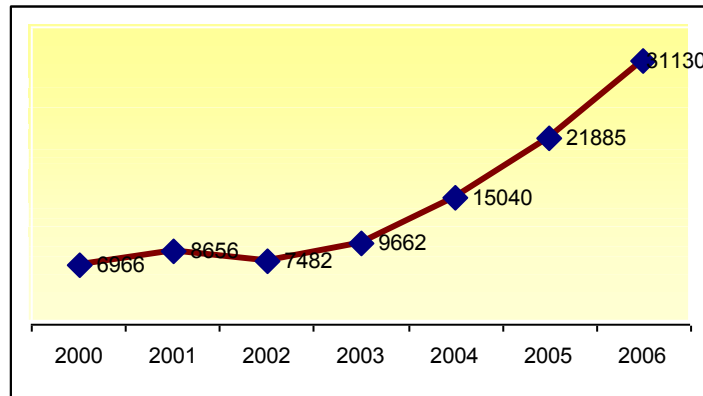


Diagram 2. FDI stock in 1990 – 2006 (million euro)

*Source: ARIS

From point of view of FDI monthly flows, the average value was for the year 2006 from approximately 757 million euro, strong stricken by the entrance in October of 2,2 billions euro from National Bank of Romania privatization.

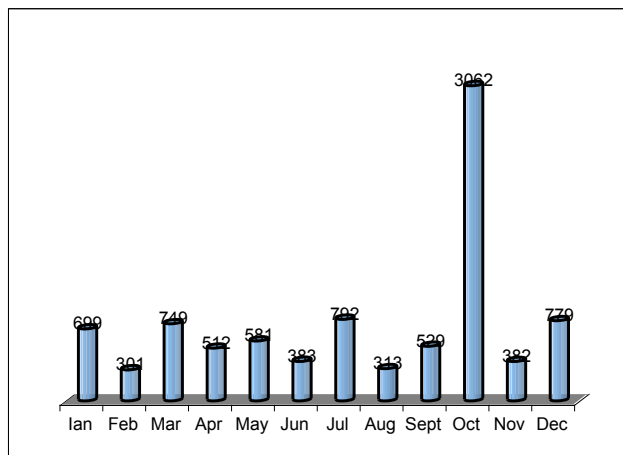


Diagram 3. Monthly FDI flows 2006

*Source: ARIS

In the year 2006, the bitter competition in the attract of FDI in the region of Central and the East Europe, Romania possessed a deserved place two with a value of 9,1 billions euro.

The Romania attractivity as destination country for the foreign investors was manifested inclusive through the development in 2006 with 9,2 %, comparatively with previous year, of the trade companies number with foreign participation new registered. As gravity, year 2006 represent 9,1% from the total number of trade companies registered in Romania in period of years 1991 – 2006.

From the viewpoint of monthly distribution the number of the trade companies with foreign participation at capital new registered had a relative constant tendency of development.

3. Conclusion

In conclusion, the FDI became the most important source of external financing for all the world countries, indifferent of their development level. This kind of investments prove to be a more stabile and used source of finance than those of portofolio even than banking loans, because are less affected by the financial crisis.

“Every investment represent an investment in Romania, in the people of this country, in her capacity to constituted in a credible partner for the representatives of the international business medium. Foreign investments are those who put you on the map. They represent the barometer, the health of a nation...Last year, Romania was situated through the first countries in region as FDI receiver and the positive signals from those who have a word to say regarding the business community hasn't delay to appear. International creditable companies at world level chose Romania and, today, our country is ticked of on the international map of the success locations as attractive destination to invest the capital.

Exist like country, like destination in business medium when you prove to you as nation, and to those from the outside who watching you, the fact you can offer, assure the premises and the necessary frame to obtain profit. Year 2006 prove not only that we exist like country from business destinations point of view, but we are situated on a position more honorable ahead the biggest international players who give today to Romania maybe the most value rating of country: the respect”.¹²

4. References:

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¹² Florin Vasilache, General Secretary Romanian Agency for Foreign Investments

XML PUBLISHING SOLUTIONS FOR A COMPANY

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Abstract

The eXtensible Markup Language, or XML is a method to add structure and context to unstructured information. This paper presents some of the latest issues in using XML as a standard for information publishing. We present XBRL (eXtended Business Reporting Language) and possible applications in elaborating financial documents. We also present DITA (Darwin Information Typing Architecture) as a new XML based standard developed by IBM. DITA is used for technical information structuring and publishing. In the final part we present a DITA implementation of a procedures manual for a hypermarket.

Keywords: XBRL, XML, DITA, HTML, taxonomy, instance document

1. Introduction

XML (EXtensible Markup Language) is an open standard that describes data from the Web. XML defines data elements on a Web page and business-to-business documents. XML uses tag structure like HTML but, whereas HTML defines how elements are displayed, XML defines what those elements contain. HTML uses predefined tags and XML allows tags to be defined by the developer of the page. Thus, data items can be described as database records. XML supports business-to-business transactions and has become a standard for electronic data interchange and Web services.

2.XML Based Languages

2.1. XBRL (eXtended Business Reporting Language)

XBRL (Extended Business Reporting Language) is a communication language that can be used to send/receive business or financial information in a standard form. It is based on XML technologies and is fast becoming a standard means of communicating information between businesses and on the Internet. XBRL can be used to efficiently :

- Elaborate reports
- Analyze financial data
- Share financial data
- Verify data

XBRL is a global effort for building a digital reporting language. This standard makes the global communication easier:

- XBRL creates a common vocabulary for financial information description
- Every country has a national chapter but the structure of the documents is the same.

Many European countries have developed taxonomies for XBRL implementation:

- Belgium-Belgium National Bank
- Denmark-Danish Commerce and Companies Agency (DCCA)
- European Union – European Committee of Central Balance Sheet Data Offices (ECCBSO)
- Germany – DeutscheBank, Bundesbank

2.1.1. XBRL structure

The taxonomy

A XBRL taxonomy [1] is a dictionary of terms built in a hierarchycal structure. The taxonomy consists of two important parts: the schema file (or more schemas) and linkbases.

The schema file contains the elements and their characteristics such as names, ids and other attributes. A schema file has an .xsd extension and it is an XML schema file.

The root element of all schemas is called <schema>. The starting root element is <schema> and the ending root element is </schema>. XML documents and XBRL documents as well use namespaces. A namespace is used to distinguish between elements of different schemas. A namespace is like an Internet address (“http://xbrl.iasb.org/int/fr/ifrs-gp/”) but it’s not. The reason for using such names is their uniqueness and so unique elements in the schemas can be identified.

Elements are in fact business concepts like *Assets*. In the following example we present a concept named “Depreciable”. The most important parts provided in this example, from a business perspective, are name, type, balance and PeriodType.

```
<element id="ci_Depreciable" name="Depreciable"  
type="xbrli:monetaryItemType" substitutionGroup="xbrli:item"  
xbrli:periodType="instant" xbrli:balance="debit" />
```

Name is a unique element assigned to the concept, *type* is the type of the concept (in our case is a monetary type), *PeriodType* makes a distinction between flows and resources.

Payments, revenues or profit have the *PeriodType duration*.

XBRL has also to express the balance nature of the concept: *debit* or *credit*. The schema document reflects the nature of the concept by using the *balance* attribute: *balance="debit"*.

Linkbases [1] are the components of the taxonomy that provide relationship between elements and link them with external resources.

The *linkbase files* are named using the name of the taxonomy followed by an underscore and then the type of the linkbase file :”*basicCalculation_labels.xml*”. In this case the taxonomy file name is *basicCalculation.xsd*.

The taxonomy *linkbase files* [1] are:

- labels
- references
- presentations
- calculations
- definitions

The *labels file* [1] has the detailed description for all the elements in the taxonomy. There are at least four entries for each element if a single language is supported:

- locator entry
- label entry
- arc entry from the taxonomy to the label
- arc entry from the label to the taxonomy

The *reference file* [1] points to source documents (documents issued by the authorities) indicating the relevant paragraphs and clauses.

The *presentation file* [1] is responsible for displaying the elements on the order in which it should appear in the financial statement.

The *calculation file* [1] improves the quality of the XBRL report. It has definitions of validation rules. These validation rules apply to all instance documents that refer to a specific taxonomy.

The *definition file* [1] creates all the parent-child relationships.

Instance documents

XBRL instance documents are electronic reports created according to the XBRL taxonomy. An instance document contains concepts with a given value and a context in which those concepts are used.

An instance document defines contexts such as *period* or *measure*.

For example:

```
<context id="I-2002">
  - <entity>
    <identifier scheme="http://www.SampleCompany.com">SAMP </identifier>
  </entity>
  - <period>
    <instant>2002-12-31</instant>
  </period>
</context>
```

and

```
<context id="I-2003">
  - <entity>
    <identifier scheme="http://www.SampleCompany.com">SAMP</identifier>
  </entity>
  - <period>
    <instant>2003-12-31</instant>
  </period>
</context>
```

define two instant moments.

The unit tag defines the type of the monetary item. In our case EURO.

```
<unit id="U-Monetary">
  <measure>iso4217:EUR</measure>
</unit>
```

Element’s definition in the taxonomy:

```
<element id="ci_ComputerEquipment" name="ComputerEquipment" type="xbrli:monetaryItemType"
substitutionGroup="xbrli:item" xbrli:periodType="instant" nillable="true" />
```

The following tags define the effective use and the contexts of the concept *ComputerEquipment* in the instance file.

```
<ci:ComputerEquipment contextRef="I-2002" unitRef="U-Monetary">5313000</ci:ComputerEquipment>
<ci:ComputerEquipment contextRef="I-2003" unitRef="U-Monetary">4169000</ci:ComputerEquipment>
```

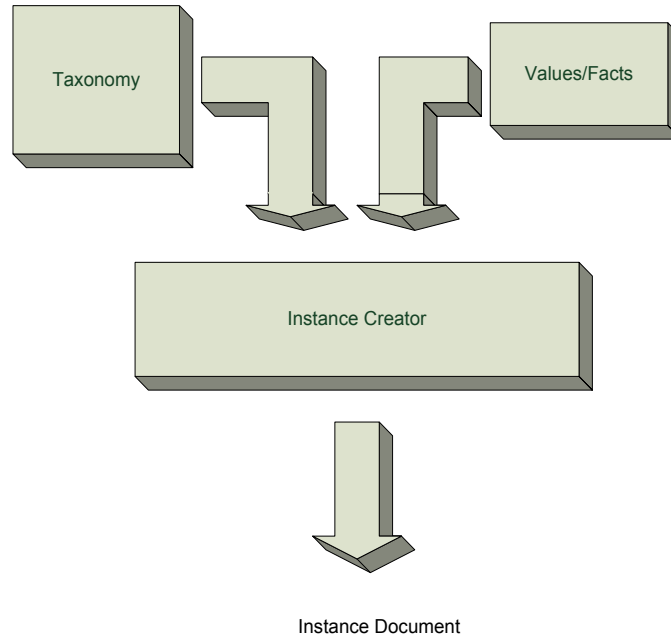


Figure 1. The process of creating an instance document

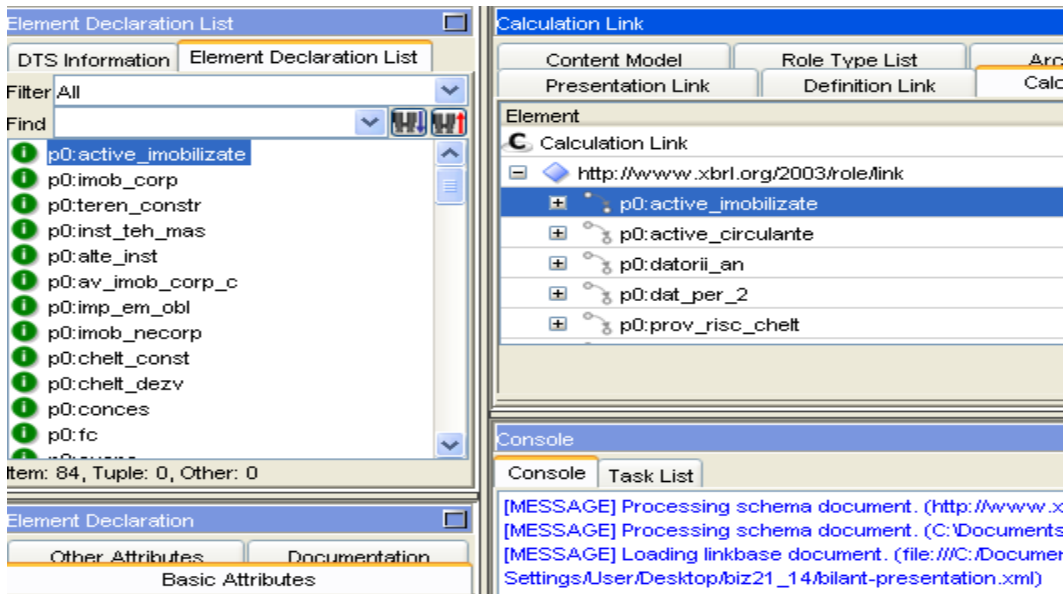


Figure 2. Fujitsu Taxonomy Creator Screenshot

The instance document may have the same layout as the original document. Reading an instance document is a process that extracts the data out of the document.

2.1.2. Sending XBRL Balance Sheet Documents to Local Financial Administration

The process of creating XBRL balance sheet documents needs a taxonomy and instance documents for every balance sheet. The taxonomy will contain all the concepts needed together with their attributes and relationships. The instance document was created using an instance creator named Fujitsu Instance Creator. The instance document contains values from the original document.

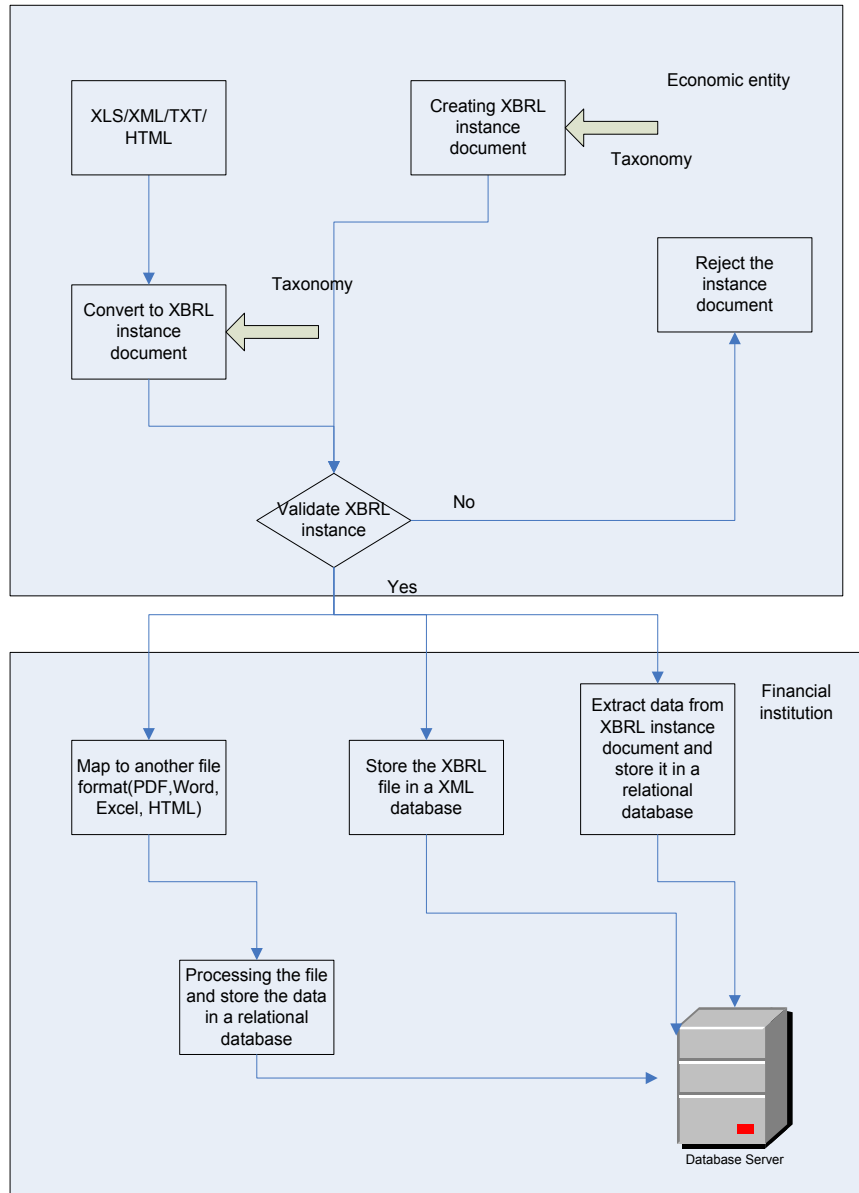


Figure 3. XBRL Framework

The above XBRL framework can be used to send financial documents/reports to a financial institution. The XBRL documents can be created from Excel files. In this case we have to use a conversion software. A good solution might be Rivet’s software Dragon Tag.

The XBRL instance document can be created, as you had already seen, by using instance creator software or some Adobe based solutions like the one provided by Corefilling company.

Storage and processing data collected from XBRL documents is made by using several ways:

- storage in files;
- storage in relational databases;
- storage in native XML databases.

There are several software vendors for the above storage solutions: Tamino XML server, Semansys Tamino XBRL Suite, Xindice.

2.2. Dita (Darwin Information Typing Architecture)

The Darwin Information Typing Architecture (DITA) [2] is an XML-based architecture for authoring, producing, and delivering technical information. DITA includes topics like: Task, Concept, Reference. A Task topic describes how to accomplish a task. It displays a list of steps that the users must follow to produce a specified result. Concept contains definitions, rules and guidelines. A Reference topic describes command syntax, programming instructions, reference material. DITA is an emerging standard that provides an outstanding platform to promote information interchange, in an orderly fashion, within an enterprise or with other organizations. DITA provides several good methodologies for managing an “information supply chain” where supplier and consumer can easily interchange topics. DITA provides an excellent infrastructure for managing information at a topic level, getting away from document hierarchies that in the past have added complexities to interchange. The DITA architecture, a related DTD and a W3C-Schema was originally developed by IBM. DITA is now an OASIS standard.

Using DITA for publishing procedures manuals

Procedures manuals are a collection of task to accomplish by the employees of a company. Structuring a procedure manual has become an easy task using DITA. Taking advantage of the DITA specification, the manuals can be structured using DITA topics: Task, Concept or Reference. On the other hand, the manuals may be print for different audience.

In this section we are trying to design a DITA structure for the procedures manual of a hypermarket.

The DITA Structure of a Procedure Manual for Goods Receiving in a Romanian Supermarket

Creating Content

We used the XMLMind editor for creating the DITA procedures manual. XMLMind is a free XML editor which has a free DITA plug-in that provides user-friendly templates for standard DITA topic types an for DITA map files.

First, we created the concepts, then the tasks and the references. Each concept or task or reference is an xml file. The topics that we have created are:

Topics

Concepts

- Receptie marfa
- Comanda
- NIR
- ...

Task

- Lansare comanda
- Verificare existența comandă
- Verificarea mărfii la recepție
- ...

Reference

- Starea comenzii
- Inregistrarea receptiei
- Document privind returul/refuzul de marfa
- ...

Audience

- Director magazin
- Sef departament
- Category manager
- Sef raion
- Operator calculator
- Lucrator comercial

After creating these topics we have created the ditamap file. Ditamap is a map file that puts together all the files into a single document. The map file describes the sequence and hierarchy of the topics and sometimes the relationship between them.

There can be created as many map files as one need. For example, one map file for a PDF output and one map file for the HTML output.



Figure 4. Creating a DITA Concept with XMLMind

An important step in creating DITA documents is conditional processing or filtering logic [3]. To exclude topics that have certain attributes from the output we have created a ditaval file using *prop* elements with attributes *att*, *val*, *action*. For example:

```
<prop action="exclude" att="audience" val="director departament">
```

will exclude all topics that are related with the “director departament” duties.

The final step is creating output. The Dita Open Toolkit [3] can build output in HTML format or PDF format. The output can be customized using CSS styles or by modifying XSL templates. We could create output for every category of audience: *director departament*, *sef receptie marfa*, ...

3. Conclusion

XML is fast becoming “the language” for information interchange and describing relationships. There is XML for biology, XML for chemistry, XML for rights management, XML for finance, XML for business rules, XML for publishing, etc. In this paper we tried to present some of the latest applications of XML. We have presented XBRL as the language for business reporting and DITA a new standard for writing documentation. We also have presented some adequate XML solutions for companies. In the near future, together with the Marklogic environment or TextML server we think that companies will implement XML solutions for document management as a standard.

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FLEXICURITY AS A FORWARD-LOOKING MODEL: EVIDENCE FROM NMS-12

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Abstract

The abstract should summarize the content and conclusions of the paper in less 200 words (Typically around 10 sentences). It should not contain any references or displayed equations. Typeset the abstract in 10 points, italic. Labour market in the NMS is extensive and expanding. Sound macroeconomic policies are essential to support a well-balanced economic expansion and the full realisation of current growth potential at the fact that long term unemployment remains one of the most persistent problem and social issue facing many economies. Labour market policy and social policy in the NMS are facing a challenge to regulate a rapidly evolving labour market in the context of the globalized economy. The NMS are seeking more stability and security in order to encourage employers to invest more in human capital to be able to boost productivity and competitiveness. Countries need to promote more flexibility and adaptability for both – enterprises and workers, and to better balance them with security. The share of traditional forms of flexible employment, such as fixed term and part-time jobs and other possibilities, has remained fairly stable; there has been a rise in employment based on non-labour contracts or work performed without a contract. Flexicurity system contributed to higher employment and also to higher mobility between unemployment and employment labour force in some European economies. Attitudes, values and tradition of certain economy are preconditions for successfullness of the flexicurity system.

Keywords: flexicurity, labour market, labour market policy.

1. Introduction

Slovenia became a member of the EMU on January 1, 2007 and is the only new member state (hereinafter referred to as NMS), which adopted the euro. During the process of integration in the European monetary integrations, NMS will have to gradually give up a part of their own monetary sovereignty, and abandon it completely when entering the EMU. Entering the European monetary union requires that the loss of independent monetary policy is substituted by other economic policies. Asymmetric shocks represent a problem in the common European monetary union, where the monetary policy is unable to work. Taking into account the fact that fiscal policy does not always represent a suitable instrument for taking actions, asymmetrical shocks at certain market rigidity can be neutralised only with increased capital and work mobility and a more flexible labour market.

Experience of Western European countries related to the labour market flexibility point to different strengths and weaknesses. During the period of favourable economic conditions, ageing of the population and ensuring high level of social security, during which academic and political circles believed that social economy cannot cope with structural changes and demands regarding increased labour market flexibility, increased interest among NMS for the model of flexicurity has been noticed.

There are two different approaches to flexicurity. The first approach includes flexibilisation of the whole work force and includes the majority of employees with typical working contracts. Flexibilisation can be implemented in two ways, either through new ways of organising work or through different, more diverse working time arrangements. At the same time, flexibilisation should be accompanied with some forms of employment security. In this respect, Denmark is a well-known example. It combines relaxed employment protection with a high level of employment benefits for the unemployed and active labour market policies. In doing this, the security component is ensured by the Government and not by the employers. Worker protection and not job protection is in the forefront. Austria also focused on this component, when it codified severance payments, which are transferable and not linked to one employer.

The second approach includes the normalisation of the rights of employees with atypical working contracts (part-time employment, different forms of temporary employment, and fixed-term employment), without reducing the flexibility of such contracts. The same idea will be implemented in the Netherlands through increased social security of the employees with atypical employment contracts and through the unification of their rights with those of full-time workers. Trade unions in Slovenia are also in favour of equal rights for workers on part-time employment contracts and those on full-time contracts (taking loans, education, pension rights, etc.).

There are huge differences regarding the proportion of atypical workers among the EU-15 states. In some countries have very high shares. Both the United Kingdom and the Netherlands have high percentage of part-time work, whereas Spain has a high percentage of fixed-term contracts. 30% of the entire workforce in Spain

represents employees on fixed-term contracts. Recent labour market reforms in Spain have attempted to redress some of the disadvantages associated with previous reforms, which aimed at the flexibilisation of the labour market. Excessive labour market segmentation and declining levels of per head productivity presented a huge problem. The purpose of recent reforms was to increase security and rights of workers with atypical workers and to create incentives for employers to convert atypical to typical contracts.

In our contribution, we try to answer the question if efficient combination of flexible labour market and employment security is possible in NMS and to explain the notion of flexicurity.

2. Labour market flexicurity in some EU-15 states

During the time of favourable economic conditions and high level of social security, during which academic and political circles believed that social economy cannot cope with structural changes and demands regarding increased labour market flexibility, increased interest among the majority of European countries for the Danish model of flexicurity has been noticed.

In Denmark, the balance between employment flexibility and social security is maintained by social policy, unemployment benefits, loose collective agreements, a lower degree of centralisation and with the decentralised negotiations between social partners, as well as with the help from internal labour market and setting up of small enterprises. Similarly, high level of social security is also a characteristic of the Swedish labour market, whereas the flexibility of Swedish labour market is considerably lower. This is mainly the consequence of low trust among social partners, but the situation in this area has improved considerably. Denmark belongs to countries with the lowest job security, which is nevertheless higher than in Switzerland, Canada, Great Britain and the United States.

In the Netherlands, the emphasis is on employment security and not job security. In this respect, negotiations between social partners and part-time employment play an important role. Belgium and Germany have high flexibility in their internal labour markets, whereas Denmark and the Netherlands have high flexibility in their external labour markets. Unlike the Netherlands, Germany and Belgium have more traditional forms of flexibility, emphasising internal numerical flexibility and job security (see Table 1).

Belgium, Luxemburg and Portugal developed a system, which ensures high employment security. The same holds true for Spain and Ireland, where employment security is slightly lower. In Spain, security and flexibility are differentiated with regard to different groups of employees, which is a consequence of a dual labour market. On one labour market employees are highly protected, whereas on the other they are much less protected, which leads to a higher flexibility of this labour market. In the United Kingdom the model of liberal labour market prevails, which enables easier and quicker promotion and thus leads to greater employment security. In Great Britain, Portugal and Luxemburg the time to convert atypical employment to typical is the shortest.

Table 1. EU states with regard to predominant flexicurity type

	Job security	Employment security	Income security	Combination security
External numerical flexibility	Spain	The Netherlands, Denmark	CEE countries	
Internal numerical flexibility	Belgium, Germany, Austria	The Netherlands, Spain	Austria	Finland
Functional flexibility	Germany, Portugal	Italy, Latvia	Germany	Denmark
Labour cost/wage flexibility	Portugal, Austria		Austria	
Externalisational flexibility				

Source: [1] and [2].

There are different forms of labour market flexibility: **1.** external numerical flexibility, **2.** internal numerical flexibility, **3.** functional flexibility, **4.** labour cost/wage flexibility and **5.** externalisational flexibility. With regard to security we differ between: **1.** job security, **2.** employment security, **3.** income security and **4.** combination security (see Table 2).

Table 2. Flexicurity matrix

Varnost/ fleksibilnost	Job security (protection against lay-offs and considerable changes regarding working conditions)	Employment security (availability of suitable jobs)	Income security (ensured minimal benefits when unemployed)	Combination security (a combination of afore-mentioned forms of security)
External numerical flexibility (flexibility regarding employment and laying-off)	<ul style="list-style-type: none"> ▪ Types of employment contracts ▪ Employment protection legislation ▪ Early retirement 	<ul style="list-style-type: none"> ▪ Employment services /active labour market policy ▪ training/life - long learning 	<ul style="list-style-type: none"> ▪ unemployment compensations ▪ other social benefits ▪ minimum wages 	<ul style="list-style-type: none"> ▪ protection against dismissal during various leave schemes
Internal numerical flexibility (flexibility regarding working hours)	<ul style="list-style-type: none"> ▪ shortened work /week / part - time employment 	<ul style="list-style-type: none"> ▪ employment protection legislation ▪ training/life - long learning 	<ul style="list-style-type: none"> ▪ part-time supplementary benefit ▪ study grants ▪ sickness benefits (e.g. due to sickness or injuries) 	<ul style="list-style-type: none"> ▪ different kind of leave schemes ▪ part-time pension
Functional flexibility (job rotations with regard to different jobs and types of work)	<ul style="list-style-type: none"> ▪ »multitasking« ▪ training ▪ labour leasing ▪ subcontracting ▪ »outsourcing« 	<ul style="list-style-type: none"> ▪ training/life-long learning ▪ job rotation ▪ teamwork 	<ul style="list-style-type: none"> ▪ performance related pay systems 	<ul style="list-style-type: none"> ▪ voluntary working time arrangements
Labour cost/ wage flexibility (adjustments regarding wages according to performance of employees and companies)	<ul style="list-style-type: none"> ▪ local adjustment in labour cost ▪ scaling/reductions in social security payments 	<ul style="list-style-type: none"> ▪ changes in social security payments ▪ employment subsidies ▪ in - work benefits 	<ul style="list-style-type: none"> ▪ collective wage agreements ▪ benefit for shortened work week 	<ul style="list-style-type: none"> ▪ voluntary working time arrangements
Externalisational flexibility (employment without employment contracts, through employment agencies)				

Source: [3] and author's amendments.

3. Flexicurity in NMS-12

After 1990, NMS-12 were faced with the decrease of the number of employed and increased long-term unemployment. Employment trends moved from large state-owned companies to small and medium-sized private enterprises and from primary and secondary to tertiary and quarter sectors.

In their efforts to adapt their labour markets, Slovenia and the Check Republic were among the most successful NMS countries (and also Slovakia). They succeeded in lowering the unemployment rate to one digit level, and at the same time retain high level of work activity. The reason for this is likely to lie in more favourable economic structure and efficient labour market policy.

Due to less favourable economic structure labour market adaptation in Poland lasted for a longer period of time than in other NMS. The reason for this lies in ineffective labour market policy. Kluwe, Lehmann and Schmidt [4] found out that the long-term labour market policy was efficient enough, but the efficiency of various employment programmes aimed at the improvement of professional worker mobility was hindered by market inconsistencies. Boeri and Flinn [5] for example, found out that low level of employing unemployed persons was the consequence of segregation of those who had been once employed in the public sector, because it was difficult for them to get employment in the private sector. An important reason for a slower labour market

adaptation can also be found in too low percentage of gross domestic product for financing active labour market policy. Poland had, similarly as Slovenia, introduced the programme of public works, with the purpose to improve full-time employment opportunities for the unemployed. The Slovene programme differed from the Polish programme in that it ensured jobs in education and culture also for more educated unemployed workers.

Among the NMS, Poland has highest degree of unemployment and second lowest degree of work activity. Only Hungary has a lower degree of work activity. Low professional and spatial mobility of workers can partly be explained by the increase in the number of unemployed workers and agricultural subsidies.

The Czech Republic implemented both active and passive labour market policy. Its active labour market policy was carried out in local employment offices. Within the framework of this policy, it also implemented programmes for the employment of disabled and graduates. Its passive policy was implemented through unemployment benefits. The unemployed were receiving such compensation for the maximum period of six months, and amounted to 60 % of their last net wage, and not exceeding 150% of minimal wage. In addition to programmes of active labour market policy, the Czech Republic effectively implemented programmes of passive policy, because they did not have a negative influence on the duration of unemployment.

Because spending for active labour market policy in NMS-12 is very low, they lag behind the Danish model of flexible security considerably. On the other hand, there are analyses that confirm the efficiency of some programmes (Ederveen and Thiessen 2004). Among NMS-6, Slovenia had the highest percentage of GDP expenditure for active labour market policy in 1998 (0.83), and was followed by Slovakia (0.32), Poland (0.30), Hungary (0.30), Estonia (0.07) and the Czech Republic (0.05). The highest percentage for GDP expenditure for active labour market policy per percentage of unemployment among NMS-6 in 1998 had Slovenia (0.11), Hungary (0.036), Poland (0.028) and Slovakia (0.026), the lowest the Czech Republic and Estonia (0.007). Despite the fact that Slovenia had the highest percentage among NMS-6, it was still below the EU average (0.16), and lagged considerably behind the Netherlands (0.55) and Denmark (0.34), which belong to OECD countries with the highest percentage of GDP expenditure aimed at active labour market policy per percentage of unemployment. The OECD average in 1998 was 0.14.

Between 1996 and 2004, the expenditure from GDP in NMS-7 regarding active labour market policy decreased considerably. The Czech Republic and Lithuania were the only exception. Despite the fact that all NMS implemented different programmes of active labour market policy, the expenditure remained low. At the same time, their growth lagged behind the growth in GDP, which remained considerably high all the time. Despite high level of unemployment in Poland and Slovakia, they also recorded, as all other NMS, decreased expenditure for active labour market policy (see Table 3).¹³

Table 3. Expenditure for active labour market policy [% of GDP],
(in brackets: normalised to the unemployment level)

	EU-14	NMS-7	CZ	EE	HU	LV	LT	PL	SL	SK
1996	1.17 (0.13)	0.26 (0.026)	0.12 (0.031)	0.06 (0.006)	0.37 (0.039)	0.16 (0.012)	0.09 (0.006)	0.49 (0.040)	-	0.56 (0.048)
1998	-	-	0.05 (0.007)	0.07 (0.007)	0.28 (0.036)	-	-	0.30 (0.028)	0.83 (0.11)	0.32 (0.026)
2004	0.7 (0.11)	0.12 (0.013)	0.133 (0.016)	0.043 (0.004)	0.207 (0.034)	0.085 (0.007)	0.154 (0.015)	0.16 (0.008)	-	0.072 (0.004)

Note: (-) data not available. Source: [6] and own calculations.

In addition to expenditure for active labour market policy, expenditure for passive policy also decreased during the period between 1998 and 2004 in NMS-7. The only exception being the Czech Republic, Estonia and Poland. Among NMS-7, the highest percentage for passive labour market policy expenditure in 1998 had Hungary (0.91) and Slovenia (0.89), and the lowest in Estonia (0.10), Latvia (0.22) and the Czech Republic (0.27). All NMS-7 had a lower percentage than the EU-15 average (see Table 4).

The highest percentage of expenditure from GDP for passive labour market policy per percentage of unemployment level can be found in 1998 in NMS-7 in Slovenia (0.11), Poland (0.058) and Slovakia (0.044), the lowest in Estonia (0.01) and Lithuania (0.017). NMS-7 average amounted to 0.05, in 2004 to 0.03.

¹³ NMS experiences proved that DFI (direct foreign investment) is extremely important for the creation of new jobs. Thus, the promotion of DFI can be considered as a measure of active labour market policy.

Table 4. Expenditure for passive labour market policy [% of GDP],
(in brackets: normalised to the unemployment level)

	EU-15	NMS-7	CZ	EE	HU	LV	LT	PL	SK	SI
1998	2,4 (0,26)	- (0,05)	0,26 (0,036)	0,10 (0,01)	0,91 (0,036)	0,62 (0,043)	0,22 (0,017)	0,59 (0,058)	0,56 (0,044)	0,89 (0,11)
2004	1,94 (0,22)	- (0,03)	0,28 (0,034)	0,25 (0,026)	0,37 (0,06)	0,35 (0,034)	0,10 (0,009)	0,65 (0,034)	0,36 (0,02)	- -

Note: (-) data not available. Source: [7] and own calculations.

Before entering the EU, NMS established the majority of labour market institutions, which exist in EU-15. By doing so, they wanted to increase labour market flexibility and improve adjustment capability of the economy. The majority of states introduced the system of social security in cases of unemployment, which included unemployment benefits. Initially, unemployment benefits were rather high, and had to be lowered later. The reason for this lies in the development of rent seekers and in increased pressure on public finance.

The level of unemployment benefits range in the EU-15 between 50-70 % and are considerably higher than in NMS. The unemployed receive benefits for 6 to 12 months. The amount of unemployment benefits decreased in Lithuania, Hungary, Poland and in Slovakia and remained more or less the same in Lithuania and the Czech Republic. The only exception is Estonia, which increased the amount of unemployment benefits in 2003 by 7 %. Despite the increase, the amount remained below the EU average (see Table 5).¹⁴

Table 5. The amount of unemployment benefits (2003)

	EU	NMS-8	CZ	HU	PL	SK	SL	EE	LV	LT
First month	63	50	50	64	40	60	63	50	50	25
60th month	37	16	31	24	30	42	0	0	0	0

In NMS unemployment benefits are received for a shorter period than in the EMU. Despite higher level of long-term unemployment, unemployment benefits are less progressive in CEE states than in EMU countries. The amount of unemployment benefits ranges between 67 and 130 % of average wage.

In the period of transition, minimum wage in NMS was rather low, and was only partly adapted to price growth level, and if so usually with a considerable delay. Not so long ago, minimum wage was adapted to the growth of cost of living. In NMS, the value of Kaitz index (which represents the relationship between minimum and average salary) is around 30, which is considerably below the EU average (50). The average minimum wage in NMS amounts to one fifth of the average wage in the EMU. Only in Slovenia the average wage can be comparable to the average wages of countries at the bottom of the EMU scale. Among NMS-8, Slovenia had the highest minimum wage in the second part of 2006 (511,6€), whereas the lowest minimum wage had Latvia (129,3€) (see Table 6).

Table 6. Minimum wage (2006, 2nd half of the year)

	NMS-8	CZ	HU	PL	SK	SL	EE	LV	LT
€/month	240.1	280.2	229.5	223.3	181.3	511.6	191.7	129.3	173.8

In NMS, the limitations regarding the salaries in private sector are not binding. The percentage of employees, who are trade union members, is in NMS comparable with the EMU average, whereas the percentage of employees, who are involved in collective bargaining, is not comparable. In NMS, the role of trade unions is weaker than in the EMU and in the EU-15. The percentage of employees, who are trade union members, amounts to 23 % in NMS-8, and to 43 % in EU-15. The percentage of employees, who are involved in collective bargaining, is 37 % in NMS-9, and 72 % in the EU-14. In NMS, collective bargaining is carried out mainly on entrepreneurial level, whereas in the EU-15 they are carried out in the sectoral level. Slovakia and Slovenia are the only exception. The percentage of employees, who are trade union members, has decreased considerably lately (see Table 7). The highest decrease is seen in Baltic countries, Poland, Slovakia, and slightly less in the EU-15. The reason for such decrease is the decrease of the share of processing services and an increase in the share of services, which are less unified.¹⁵

¹⁴ The correlation between the amount of unemployment benefit and employment security is negative.

¹⁵ Privatisation of state companies, higher level of unemployment and increased number of small and medium-sized enterprises are key reasons for the decrease of unification in individual sectors.

Table 7. The percentage of paid workers, who are trade union members (1995/2002) or are involved in collective bargaining (2002)

	EU-15	NMS-8	CZ	EE	HU	LV	LT	PL	SK	SI
% of paid workers, who are trade union members	44/43 ¹ (30) ^{3,4}	46/23 ² (22) ^{3,5}	43/30	36/14	60/20	30/15	40/15	34/15	62/35	60/41
% of paid workers, who are involved in collective bargaining	72	37	25-30	28	31	<20	10-15	40	48	100

Notes: ¹Unweighted EU-13 average. ²Unweighted NMS-8 average. ³Weighted average for 2002. ⁴Data for EU-14. ⁵Data for NMS-9. Source: [8]

Employment security index (index EPL)

During the previous socio-economic system employment security was extremely high in the majority of NMS-12. The basic feature of labour markets was high employment growth. During the 70s of the previous century the employment growth level in Slovenia increased by 3.8%, which was the consequence of the then socio-economic system, which allowed for permanent retention of jobs. After 1973, when the opportunities to get employment abroad decreased and when, after 1980, economic growth in the ex-Yugoslavia begun to stagnate, the autonomous employment growth caused the growth of disguised unemployment. Due to the economic crisis the annual employment growth level decreased to 0.3%. After 1987, registered unemployment also started to increase. Because of economic restructuring and higher efficiency in the distribution of production factors, employment security decreased in the majority of NMS-12 after 1990.

In the majority of NMS EPL index has decreased from the 90s of the previous century to 2004. In 2003, the Czech Republic and Hungary had the lowest EPL index among the NMS-12, which have the most flexible working legislation. They were followed by Slovakia, Poland and Lithuania, and Latvia, Estonia and Slovenia, which have similar EPL index as the EU-14 states. Bulgaria, Estonia, Lithuania and Romania have strict employment legislation, especially in the area of collective redundancies (see Table 8). Baltic states have a higher EPL index and lower amounts of unemployment benefits, whereas Central European states have a more flexible legislation and higher amounts of unemployment benefits.

Table 8. EPL index¹ za NMS-9 [1-6] (end of 90s of 20th cent./2002/2003/2004)

	Index EPL (1-6)	EPL index components		
		Full-time employment	Part-time employment	Collective redundancies
Bulgaria	2,8/2,5/-/2,0	2,3/1,9/-/2,1	3,4/3,4/-/0,9	2,9/1,8/-/4,1
The Czech Republic	2,2/2,1/1,9/2,0	3,0/2,8/3,3/3,3	0,5/0,5/0,5/0,5	3,2/4,3/2,1/2,6
Estonia	2,4/2,6/2,6/2,3	2,9/3,1/3,1/2,7	1,7/1,4/1,4/1,3	2,9/4,1/4,5/4,0
Lithuania	-/-/2,7/2,8	-/-/3,0/2,9	-/-/1,4/2,4	-/-/4,9/3,6
Hungary	1,8/1,7/1,7/1,6	2,1/2,1/1,9/2,2	1,2/0,6/1,1/0,4	2,5/3,4/2,9/3,4
Poland	2,0/2,0/2,1/2,2	2,3/2,2/2,2/2,0	1,4/1,0/1,3/2,0	2,7/3,9/4,1/3,5
Romania	-/-/2,8	-/-/1,7	-/-/3,0	-/-/4,8
Slovakia	2,3/2,4/2,0/1,7	2,6/2,6/3,5/2,7	2,0/1,4/0,4/0,3	2,4/4,4/2,5/3,0
Slovenia	3,3/3,5/2,3/2,6	3,4/3,4/2,9/2,7	2,7/2,4/0,6/2,3	4,5/4,8/4,9/3,3
NMS-9 average	-/2,5/-/-	-/2,5/-/-	-/1,7/-/-	-/3,9/-/-
EU average	2,4/2,4/-/-	2,4/2,4/-/-	-/2,1/-/-	-/3,2/-/-

Note: ¹Employment Protection Legislation Index. EPL index is calculated as weighted average of 22 indicators, which are regarding to procedures, expenses, limitations and conditions regarding the termination of employment contract. The value of EPL index can be 1-6: countries with the most flexible legislation have index close to 1, countries with the least flexible legislation have index close 6. (-) data not available. Source: [9], [10] and [11].

With regard to security indicators of part-time employment, convergence was noticed among the EU-14 states in the period between 1990 and 2003. In Southern European countries, the flexibility of labour legislation increased, whereas in Anglo-Saxon it decreased. This is also one of the reasons why the Czech Republic, Slovakia and Slovenia are getting closer to Great Britain and Ireland with regard to part-time employment security indicators. In 2003, Slovakia liberalised labour legislation regarding collective redundancies and full-time employment. The most important reforms in the labour market were carried out in Slovenia, which had an influence on the lowering of EPL index in 2003. Slovenia does not lag behind the Western European countries with regard to flexible employment practices. Among all newly signed contracts 70 % were part-time contracts. Despite reforms Slovenia still has the most restrictive labour legislation among CEE-8 countries.

Full-time employment

In the Czech Republic and Bulgaria an employer does not need to give a valid reason in order to give notice. On the other hand, it is obligatory in Slovenia to give a valid reason for the termination of employment. Slovenian legislation states the following among valid reasons for the termination of employment: business reason, the reason of incapacity and fault reason. The Act also states unfounded reasons for the termination of an employment contract: temporary absence from work due to disease or injury or due to parental leave, trade union membership and participation in trade union activities (including participation in a strike). Exercising workers' rights against an employer is also stated in the Act. Before the employment termination, the employer has to carry out certain procedural obligations – the employer must in writing call the worker's attention to the possibility of employment termination. The employer must provide the worker an opportunity to defend himself (this is also the case in Hungary). If thus requested by the worker, the employer must inform in writing the trade union. The trade union may give its opinion within eight days. If the trade union opposes the termination, the termination of the contract is not effective until the expiration of the term for arbitration and/or judicial protection. Because the termination of contract is not effective, the worker remains employed until the process is concluded. This is an extremely important protection. In Estonia, the employer also has to inform trade unions about the employment termination, whereas in Ukraine, the employer only has to do so in cases when the worker has not been offered another job or in cases when a worker does not want to accept the offered job.

Trade Unions also have an important role in Croatia, the Czech Republic and in Lithuania, as well as in Slovakia, where employers have to negotiate the employment termination with the Trade Union (which is similar to the situation in Poland).

The amount of unemployment benefit depends on the reason for the employment termination in Bulgaria, Estonia, the Czech Republic and in Slovakia. In Slovenia, the amount depends on years of service, if the employment termination is due to business reasons (because of economic, technological, structural, organisational and other reasons).

In some NMS-12 states (e.g. in the Czech Republic and in Lithuania) age, years of service, the number of dependents, etc have to be considered before the employment termination. In Hungary, Poland and Bulgaria employers have to offer another job before the employment termination. In Estonia, workers are treated preferentially with regard to their trade union activities and skills, whereas in some NMS countries social components are taken into account.

In the case of unfounded reasons for employment termination the employer is obliged to pay the worker the compensation for any loss of income and penal provisions. This does not hold true for Croatia, Estonia and Slovenia. Slovenian legislation does not directly determine the amount of compensation for the loss of income and penal provisions, whereas in Estonia and Bulgaria the legislation determines that the compensation for the loss of income should amount to six last average salaries. In Croatia the amount of compensation depends on the duration of the last signed employment contract and on the age of the worker. Frequently, the amount of compensation for loss of income also depends on the employer who may or may not offer the worker who has been previously made redundant to conclude a new employment contract.

Part-time employment

Part-time employment depends on objective circumstances, among which the following should be mentioned: temporary increased amount of work, seasonal work, project work, employment of a foreigner, employment of a manager, etc.¹⁶ In Hungary, Slovakia and Poland there are no limitations regarding the reasons for concluding part-time employment contracts. On the other hand, the conclusion of employment contract outside objective reasons differs among the states considerably due to different legislation. Croatia and Ukraine have limited the use of part-time contracts to objective, whereas Slovenia, Estonia and Lithuania also state certain special circumstances. Slovenian legislation states, for instance, that the conclusion of part-time employment contracts is possible for jobs that are temporary in their nature.

In Bulgaria, part-time employment contracts can be concluded for the period not longer than three years, and cannot, in some cases, be prolonged. There are also limitations regarding minimum duration. Such system was also introduced in 2004 by Lithuania, Estonia and Poland, whereas Hungary, Croatia and the Czech Republic introduced limitations regarding contract chaining and the total duration of such employment. Due to the problem of contract chaining in Slovenia, the duration of such employment was limited to the maximum of two years. It is not allowed, according to the legislation, to sign one or more part-time employment contracts with the same worker and for the same work for more than two years (for three years during the transitional period). After this period of time, a full-time employment contract should be signed. If the fixed-term employment contract has been concluded contrary to law or if the worker continues to work even after the period for which he had concluded the employment contract, it shall be assumed that the worker had concluded an employment contract for an indefinite period of time (see Table 9).

¹⁶ Objective circumstances are defined differently in different countries.

Table 9. Percentage of part-time employees (2005), NMS-12

	EU-27	CZ	EE	CY	LV	LT	HU	MT	PL	SI	SK	BG	RO
1995	11.7	6.7	2.1	-	-	-	6.6	-	11.6	-	-	-	-
2000	12.6	8.1	3.0	10.7	6.7	4.4	7.1	4.1	19.9	13.7	4.8	6.3	2.8
2005	14.5	8.6	2.7	14.0	8.4	5.5	7.0	4.5	19.5	17.4	5.0	6.4	2.4

Note: (-) data not available.

Slovenian legislation also determines part-time employment through Employment Services. Such part-time employment contracts are of temporary nature and can only last up to one year (the same situation is in Croatia and the Czech Republic, whereas Hungary and Slovakia do not limit the duration of such contracts). During the time, when the worker is employed, he receives a full payment, whereas during the time, when the worker does not work, the wage cannot be lower than 70% of minimum wage, the risk is being carried by the Employment Service. In some cases, the legislation does not allow such employment practices: in cases when workers employed with the user are on strike, in cases when the user has during the period of the past 12 months terminated employment contracts to a large number of workers employed (full-time) with him and in cases of workplaces that shows that workers are exposed to dangers and risks. In Poland, this employment practice can be used only within objective circumstances.

In Bulgaria, the employer can sign a part-time contract with the worker only in cases stipulated in the law, whereas Estonia and Poland do not stipulate any limitations. In the Czech Republic, the employer is not allowed to sign a part-time contract with the candidate, who completed the probation, secondary school or a faculty period less than two years ago, and who acquired suitable qualifications for certain jobs, except if the candidate is willing to sign such a contract.

In Hungary, the conditions for chaining part-time contracts have become stricter lately. The same has also been done in Poland, which, at the same time, introduced very strict legislation regarding part-time employment through Employment Services. In Bulgaria, Estonia and in the Czech Republic, chaining of part-time employment contracts is not limited in any way. This is not the case in Poland, where the employer and worker can only sign a part-time contract twice, whereas the third contract automatically becomes a full-time employment contract. In the Czech Republic, Poland and in Estonia, the labour legislation does not limit the cumulative length of part-time employment, which, on the other hand, is not the case in Bulgaria.

In Bulgaria, Estonia, the Czech Republic and in Poland labour legislation does not govern part-time employment through Employment Services.

Collective redundancies

Laying off of workers is considered collective redundancies if an employer makes workers redundant in the following way: within the period of 30 days at least 10 workers with the employer employing more than 20 and less than 100 workers are made redundant, at least 10% of workers (with the employer employing at least 100 workers, and less than 300 workers) or at least 30 workers with the employer employing 300 or more workers. This definition differs from one state to another (say in the Czech Republic, Hungary, Poland, Estonia and Latvia). In Bulgaria, collective redundancies is mentioned in the Employment Act, but not precisely defined. In Estonia and Poland, there is no legal act, which would regulate collective redundancies.

4. Conclusion

The choice of a particular form of flexicurity depends primarily on historical development of labour markets, collective agreements and the role of government in these, as well as on basic considerations of social and labour policy.

Labour market flexibility ensures labour cost adjustments and the reduction of the number of unemployed workers. This has been proved by the experiences of countries with a high labour market flexibility and low employment security. On the other hand, countries with high employment security and poor labour market flexibility have a higher level of unemployment. Labour market flexibility has an important impact on the supply of workforce, because the workforce can, under the active labour market policy, education and training adapt to the market demand. The latter can also represent a reduction in social security entitlements for the employees. Therefore, it is necessary to choose such a combination of economic policy measures in the NMS-12 that will increase labour market flexibility on one side and retain a high level of social security on the other side.

Experiences of some NMS show that it is necessary to judge the appropriateness of individual forms of labour market flexibility and security both from the point of view of competitiveness of the economy as a whole and social security of employees. The system of flexicurity requires a certain degree of »maturity« of the society and social partners, trust during negotiations and a certain negotiation culture, needed for the harmonisation of different interests among the participants (employers, employees, government). Values, ethics, competences and the attitude of workers towards success should also be taken into account. Imposing different forms of flexicurity

on the environment with rigid labour market and poorly developed labour legislation can lead to unfavourable effects, threaten social security of employees, lead to abuse of the system, increase expenses for active and passive labour market policy and question the soundness of the reforms.

An important question is also to what extent the success of different forms of flexicurity depends on economic conditions and labour market characteristics. The advantages of individual forms are, above all, shown during the period of lower economic growth, when employees become increasingly resistant to more flexible forms of employment, and when the demand for more security is on the increase. Experiences of Western European countries proved that favourable trends on the labour market during favourable economic conditions are mainly due to favourable economic trends and not more flexible employment practices. This, of course, did not bring to light all disadvantages of individual types of flexicurity.

High administrative expenses should also be mentioned among the disadvantages of flexicurity (expenses related to employment brokerage, ensuring unemployment benefits, etc.), which may appear in the case of low efficiency of the public sector. Therefore it is necessary to determine the expenses and benefits stemming from the introduction of different types of flexicurity. With frequent job changes the question may be raised about the motivation of the employers to finance education and training of employees with atypical employment contracts and what level of uncertainty is acceptable for the employees.

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MATHEMATICAL MODEL OF MEASURING THE QUALITY OF SERVICES OF THE HIGHER EDUCATION INSTITUTIONS

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Abstract

The evaluation of educational services' quality through clearly defined criteria and methodologies is a basic requirement of the Bologna Process. The authors are proposing to debate in this study a mathematical model which could be used by the higher education managers in their approaches for determining the quality of the educational services offered, and especially for establishing the place of the higher education institution managed by them in the university hierarchy.

The study uses a set of indexes proposed by various authors, adapted to the classification structure of the intellectual capital unanimously accepted world wide, namely the external and internal structure and the employees' competence. As calculation method the ROMPEDET method was used. For verifying the model's usability, this was applied in the case of the universities from Constanța, and the results thus obtained are included in the study.

Key words: quality of educational services; ROMPEDET method; intangible assets indicators

1. Introduction

In the context of the admission of Romania into the European Space of Higher Education, the exigency of national institutions for the assessment of the educational services' quality is essential, as well as the exigency of creating by each university the internal evaluation systems, by implying all the educational stake-holders. The competent authority in Romania for the assessment of the academic activity is since 2006 the Romanian Agency of Higher Education Quality Assurance (ARACIS), which in October 2006 framed a *Methodology of the quality assurance, of the provisionally authorization of functioning and the accreditation of the study programs and the higher education institutions*. Consequently, the Romanian higher education system has nowadays a system of performance indexes through which the quality of the services of various higher education institutions can be evaluated and compared. ARACIS is not yet member of the European Agency for Quality Assurance (ENQA), but it hopes that until October 2007 to become associate member. Creating such an agency, not considering that is incumbent, in the new European context, can be proved very useful if the criteria and the methodology of assessment the academic quality will succeed to apply on the reality in the market which they assess.

2. The critical analysis of the methodology of quality assessment

With regard to this subject there are currently running many debates, both public or official and informal, between those implied in a way or another in the higher education. This situation can be explained mostly by the fact that the methodology is very recent „product”, whom practical applicability begins to be tested and, moreover, which has not had the chance to be subject of the specialists' opinions, of all that are part from the higher education system, other than the ARACIS members, because has not been yet subject of the public debate.

Therefore, among the critics raised can be counted:

- using as a performance index the percentage of the graduates who enlist themselves to the master studies – it is considered to be a formal index, because many universities can enroll preferentially their own students, for accomplishing this requirement; moreover, the enlistment to the master studies can be done very easily, in the most cases for a tax of study, without exam, so practically any graduate can became master student etc;
- using as a performance index the percentage of the graduates who in two years from graduation to be employed at the level of their academic qualification – although in principle the index is relevant, it has an operational deficiency – how can prove the graduates where they work and what they do after two years from their graduation?; how can the universities find them?; how can be checked the universities if they report accurate what they have found from their graduates? etc. ;
- the assessment of the satisfaction level of the students in connection with the professional and personal training assured by the university – again, one cannot argue against this index at theoretical level, but is

also true that, at least to these days, this index cannot assume any practical significance. First of all, it should be created a common national instrument of assessment for this satisfaction, and then it should be provided a way to collect the opinions that to assure a non-vicious assessment of the answers, through the fear not to make difficulties to the universities if the subjects do not answer „like they should”;

- the fact that, by law, in Romania cannot function in the same time more agencies of assessment for the quality of the educational services, although in other European countries this is practiced and, moreover, although in this matter it is difficult, even impossible, to find that method of quality assessment against no one can argue, and the competition could be in our benefit etc. [1]

I believe these assessments to be useful, especially because until 1st of September 2007 ARACIS tests the methodologies of evaluating and external assurance of quality, in order to elaborate a final report regarding the results of the testing. Therefore, the external evaluation of the quality of higher education in Romania is yet at an experimental stage, fact which presumes that it is open to the improvements.

Beginning with the academic year 2007–2008 the methodologies of internal and external evaluation for assuring the quality will be applied, considering the results of the experimental stage. Therefore, from October 2007 it will be incumbent the implementation of a quality system in every university, with all things thus implied, and the success of this action will depend on the measure in which the management of the higher education institutions will understand that this charge is to be done by the specialists.

The authors have been elaborated and propose a model for evaluating the quality of the higher education services. The model includes the next stages:

Stage I. The issuance of a set of indicators

It is very important that they are easily understood, operated and used. Taking into account the multiple roles of the educational services, they can be grouped in the following categories, according to the structuring model of intangible assets and to the intellectual capital used in specialized literature. [2]

External structure indicators – present the situation clearly from the clients point of view – students, parents, firms which want to buy research results from university

Table 1. External structure indicators

Indicator	Symbol	Comments
Clients' satisfaction	(E ₁)	indicator determined on the basis of questionnaires addressed both to the students and to economic operators who have worked with students and gradulators
Graduators' rate	(E ₂)	calculated by reporting the number of graduates to the number of those admitted
Students' selection	(E ₃)	calculated by report between the number of those admitted in the higher education establishment and the total number of candidates
The number of students per teacher	(E ₄)	calculated by report between the number of students and the number of teachers
The existence of didactic areas related to the specifics of the area	(E ₅)	calculated by report between the space surface for didactic activities expressed in m ² and the number of student at ordinary education.
Owned market share	(E ₆)	it can be calculated at local and/or national levels
The number of research contracts signed with representatives of the business area	(E ₇)	graded depending on the period of time

Internal structure indicators – are necessary for the management of the company in order to notice the registered progress and to initiate corrective actions when needed. Such indicators may be:

Table 2. Internal structure indicators

Indicator	Symbol	Comments
Investments in the data processing systems	(I ₁)	The informational system plays an important role in obtaining the necessary information, helping in identifying the origin of any further problem.
The percentage of the number of jobs filled in with right-holder.	(I ₂)	Calculated by report between the number of right-holders and the number of available didactic jobs.
The structure of didactic jobs of professors	(I ₃)	
The proportion of the auxiliary personnel	(I ₄)	The inverse of this indicator is the specialists' proportion.

Indicator	Symbol	Comments
Employees attitude towards the workplace	(I ₅)	The employees' attitude towards the institution can be measured in the same way as customers' attitude.
Personnel fluctuation	(I ₆)	The smaller the fluctuation is, the more efficient.
"Beginners" rate	(I ₇)	Beginners will be considered the persons having seniority in office of less than 3 years.
A balanced allocation on income sources	(I ₈)	The way of allocating will be determined on three sources: study, research and other activities fees.

Development perspective – answers the question “Can the institution create, on long term, value and improve it?”

Table 3. Development indicators

Indicator	Symbol	Comments
The percentage of professors-leaders in ScD./PhD. Thesis of the total of professors	(D ₁)	It will be appreciated by grades
Investments made for personnel basic and advanced vocational training	(D ₂)	The money invested for participation at conferences, seminars, libraries' supply, etc
International collaborations intensity	(D ₃)	Takes into account both the visits to/from abroad and research contracts
Necessary instruments for the implementation of the requests provided by the Bologna process	(D ₄)	It is about a basic implementation and not one of form, which has already been realized

The indicators presented above are not restrictive but they can be further completed and improved, the authors mainly trying to emphasize their structure. [3]

The second stage of the proposed methodology obviously becomes the choice of the institutions with which the comparison will made. In the present paper the authors have chosen in order to verify the model the next universities: „Spiru Haret” University, „Dimitrie Cantemir” University, Maritime University, „Ovidius” University, „Gaudeamus” University.

The third stage. ROMPEDET method application – ROMPEDET = Romanian Model of Performance Determination.

This is a Romanian model for determining the performance; the model has been invented by Prof. Univ. Dr. Ion Stancioiu in order to appreciate the quality level of a variant in comparison with the others and applied by the authors for higher education, in order to evaluate the quality levels of Romanian universities.

The ROMPEDET method, compared with ELECTRE, Combinex and KT methods that present serious inconveniences regarding the credibility of the conclusions they reach, does not allow the subjectivity of the appreciation of quality and technical levels. Therefore, performance H_i of a variant V_i ($i = 1, 2, \dots, m$) can be obtained by adopting variant V_{k_i} as a basis and reporting it to its characteristics of variant V_i , taking into account the importance of each and every characteristic, according to the formula:

$$H_i = a \prod_{j \in S_1} \left(\frac{x_{ij}}{x_{kj}} \right)^{\gamma_j} \cdot \prod_{j \in S_2} \left(\frac{x_{kj}}{x_{ij}} \right)^{\gamma_j} \tag{1}$$

in which:

- a – scale factor (it has been proposed $a=100$ for a more evident differentiation between variants);
- x_{ij} – characteristic values of j of variant V_i ;
- x_{kj} - characteristic values of j of variant V_k ;
- γ_j – the percentage of characteristic j in defining the performance level of H_i ; γ_j is rated as such: $0 \leq \gamma_j \leq 1$; $\sum \gamma_j = 1$.
- S_1 – the subdivision of characteristics which is desirable to have high values for the performance to be higher;
- S_2 – the complementary subdivision of the characteristics which is desirable to have smaller values for the performance to be higher;

If the information about the exploiting costs are missing or the function writing of these costs reported to the characteristics of the products is difficult, the percentage γ_j can be established on the basis of the formula:

$$y_j = y_{j1} = \frac{\sum_{j_2} a_{j_1 j_2}}{\sum_{j_2} \sum_{j_1} a_{j_1 j_2}}; 0 \leq y_j \leq 1; \sum_j y_j = 1; j_1 j_2 = \overline{1, n} \quad (2)$$

in which $j_1 j_2$ represent the elements of the matrix square $A_{n \times n} = \|a_{j_1 j_2}\|$, having the values:

$$a_{j_1 j_2} = \left\{ \begin{array}{l} 1, C_{j_1} I C_{j_2} \text{ (caracteristica } C_{j_1} \text{ este de egală importanță cu } C_{j_2}) \\ 2, C_{j_1} P C_{j_2} \text{ (caracteristica } C_{j_1} \text{ este mai importantă decât } C_{j_2}) \\ 4, C_{j_1} P P C_{j_2} \text{ (caracteristica } C_{j_1} \text{ este mult mai importantă decât } C_{j_2}) \\ 0, \text{ în rest} \end{array} \right\} \quad (3)$$

where: I represents logic operator of indifference, and P logic operator of preference. [3]

For establishing the preference matrix A which represents the basis of applying the (2) formula, it is recommended the hierarchy of indicators presented above and grouped in three categories, as follows:

		External Structure Indicators							Internal Structure Indicators								Development Indicators				Grades	λ_j
		E ₁	E ₂	E ₃	E ₄	E ₅	E ₆	E ₇	I ₁	I ₂	I ₃	I ₄	I ₅	I ₆	I ₇	I ₈	D ₁	D ₂	D ₃	D ₄		
External Structure Indicators	E ₁	1	2	1	4	2	0	2	1	2	4	2	0	1	0	2	2	0	4	0	30	0,063
	E ₂	0	1	1	2	4	0	1	2	4	0	1	2	4	0	1	2	4	0	1	30	0,063
	E ₃	1	0	1	0	1	2	4	0	1	2	4	0	1	2	4	0	1	2	4	30	0,063
	E ₄	0	0	2	1	0	1	2	4	0	1	2	4	0	1	2	4	0	1	2	27	0,057
	E ₅	0	0	0	2	1	2	4	0	1	2	4	0	2	4	0	1	2	1	4	30	0,063
	E ₆	4	2	0	0	0	1	2	4	0	1	2	4	0	1	2	4	0	1	2	30	0,063
	E ₇	0	0	0	0	0	1	2	4	0	1	2	4	0	1	2	4	0	1	22	0,046	
Internal Structure Indicators	I ₁	1	0	4	0	2	0	1	0	1	2	4	0	1	2	4	0	1	2	25	0,053	
	I ₂	0	2	1	4	1	4	0	2	1	2	4	0	1	2	4	0	1	2	35	0,074	
	I ₃	0	4	0	1	0	1	2	1	0	1	4	2	0	1	2	4	0	1	26	0,055	
	I ₄	0	1	0	0	0	0	1	0	0	0	1	1	2	4	0	1	2	4	17	0,036	
	I ₅	2	0	2	0	4	0	0	2	0	1	1	4	0	1	2	4	0	1	24	0,051	
	I ₆	1	0	1	2	0	2	0	4	1	2	0	0	1	1	2	4	0	1	24	0,051	
	I ₇	2	2	0	1	0	1	4	1	1	1	0	2	1	1	4	1	0	2	28	0,059	
Development Indicators	I ₈	0	1	0	0	2	0	1	0	0	0	4	1	0	0	1	1	2	4	17	0,036	
	D ₁	0	0	4	0	1	0	0	0	2	0	1	0	0	1	1	0	1	13	0,027		
	D ₂	2	0	1	4	0	2	0	4	1	2	0	2	2	0	4	1	2	31	0,065		
	D ₃	0	4	0	1	1	1	2	1	0	4	1	0	0	1	0	1	0	20	0,042		
	D ₄	4	1	0	0	0	0	1	0	0	0	4	1	0	0	4	0	0	16	0,034		
																				475	1,000	

Table 4. Results of model application

University	External Structure Indicators							Internal Structure Indicators								Development Indicators				H
	E1	E2	E3	E4	E5	E6	E7	I1	I2	I3	I4	I5	I6	I7	I8	D1	D2	D3	D4	
	note	%	%	nr.	mp/stude nt zi	% local	nr./cadru	um/cadru	%	%	%	note	%	%	note	%	um./ cadru did.	vizite/ cadru did.	note	
Univ. Spiru Haret Constanța	0,7	0,0	0,0	0,0	1,0	1,0	0,5	1,0	1,0	1,0	1,0	0,8	0,9	0,2	0,6	0,0	0,9	0,0	1,0	635
Univ. D. Cantemir Constanța	0,2	0,5	0,0	0,3	0,6	0,3	0,2	0,2	0,2	0,7	0,7	0,5	0,2	0,7	0,5	0,0	0,4	0,1	0,2	371
Univ. de Marină Constanța	0,5	0,0	0,5	1,0	0,8	0,4	0,2	0,5	0,5	0,7	0,7	0,8	0,8	1,0	0,8	0,0	0,6	0,1	0,4	587
Univ. Ovidius Constanța	1,0	1,0	1,0	0,6	1,8	0,8	1,0	0,5	0,9	0,0	0,0	1,0	1,0	0,0	1,0	1,0	1,0	1,0	1,0	844
Univ. Gaudeamus Constanța	0,0	0,3	0,0	0,3	0,0	0,0	0,0	0,0	0,0	0,0	0,7	0,7	0,0	0,0	1,0	0,0	0,0	0,0	0,0	163
Criterii	Max	Max	min	min	Max	Max	Max	Max	Max	Max	min	Max	min	min	Max	Max	Max	Max	Max	

Global indicator of quality H_i for each analyzed university, can be determined following the application of this percentage on the previously determined indicators.

3. Conclusions:

The present methodology is part of an attempt to create an important methodology-managerial instrument for any higher education establishment manager. Using this managerial tool, they can periodically evaluate the institution they are managing and to interfere in those indicators with high percentage in order to raise the general quality level of the institution.

The proposal of the authors has the advantage of being easily applied for any university and periodical and comparative assessment is a criterion for appreciation of managerial capacities. The flexibility of the method allows the replacement and modification of the indicators in order to be permanently up-to-date to the requests of the national regulatory institutions (ARACIS in Romania).

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INTERNATIONAL COMPETITIVENESS OF POLISH ECONOMY IN YEARS 1995-2005

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Abstract

The aim of article is the analysis of international competitiveness and competitive position of Polish economy in the years 1995-2005. The first, were defined expressions -international competitiveness of economy and -international competitive position with simultaneous indication of suitable factors determining the changes of international competitiveness of economy. On the basis of conducted analysis, one may say, that the international competitiveness and competitive position of Polish economy is relatively low yet. However, in the years 1995-2005 appeared the gradual growth of competitiveness and competitive position of Poland on international arena, what confirms favorable changes of analyzed competitiveness indexes. The possibilities of increasing international competitiveness of Polish economy depend on that, whether Poland will fully use existing chances resulting mainly from the membership in European Union. Moreover, the improvement of international competitiveness of Polish economy depend on overcoming of existing barriers, such as the necessity of public finance reforms, continuation of structural reforms, enlargement of investments, increasing the elasticity of the labour market and the gradual aiming at knowledge based economy.

Key words: competitiveness of economy, international competitive position

1. Introduction

In economic literature, it exists many definitions of international competitiveness of economy. The most often the international competitiveness of economy is defined as an ability to derive the possibly largest advantages from participation in international division of labour. Next, the international competitive position (called as a competitiveness of outcome type) is the narrower notion than the international competitiveness of economy (the international competitive ability) and it mainly treats to share of economy in international trade sense largo. Therefore, it concerns the international exchange of goods, services and production factors [Misala, (2005)].

In practice, there are used many indexes to evaluate the international competitiveness and competitive position of given country. To the most often used measures belong: the indexes of macroeconomic stabilization pentagon, indexes of economic freedom, shares in world trade, indexes of revealed comparative advantages, indexes of intra-industry trade, balance of global capital flows, balance of foreign direct investments and changes of effective exchange rates [Misala, (2001)].

2. Indexes of international competitiveness of Polish economy

If Poland, according to valid constitution is a social state, then presented outline of conception of social market economy is not simple reflection of existing economic practice. According to conception of social market economy, economic policy should form cohesion integrity with a social policy, which also should be important instrument for economic development. However, in Polish reality, economic policy and social policy are led separately.

In turn, foreign policy of Poland is based on principles of liberal economy. In the area of foreign trade the most attention, concentrate on continuing the process of trade liberalization, as well as on deepening the process of economic integration with European Union. Economic policy led in this way finds one's reflection in changes of indexes of macroeconomic stabilization pentagon [cf. table 1].

Table 1. Indexes of macroeconomic stabilization pentagon for Poland in years 1995-2005 [in %]

Details	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
GDP growth rate	7,0	6,0	6,8	4,8	4,1	4,0	1,0	1,4	3,7	5,3	3,2
Unempl Unemployment rate	14,9	13,2	10,3	10,4	13,1	15,1	17,4	20,0	20,0	19,0	17,6
Inflation rate	27,8	19,9	14,9	11,8	7,3	10,1	5,5	1,9	0,8	3,5	2,1
Share of budget deficit in GDP	-3,3	-2,3	-2,7	-2,4	-2,0	-2,2	-4,3	-5,1	-4,6	-4,5	-2,8
Share of current account deficit in GDP	4,2	-1,0	-3,0	-4,3	-7,5	-6,3	-3,9	-3,5	-1,9	-4,1	-1,6

Source: The own study on the basis of Central Statistical Office data.

From data presented in above table results that generally in years 1995-2005 appeared relative improvement of international competitiveness of Polish economy. What's more, the most noticeable improvement of indexes of macroeconomic stabilization pentagon took down in 2005 year, what shows about essential improvement of Polish competitiveness.

The analysis of individual macroeconomic indexes does not show full sight of economy and this makes difficult for the evaluation of economic situation changes in time. The more effective method of analysis is simultaneous view on several main economic measures of country. One of instrument, which enable evaluation of five such macroeconomic indexes, is the graphic presentations in the form of macroeconomic stabilization pentagon (Babińska, 2004). In that method are used the statistical data concerning five basic macroeconomic measures, such as GDP growth rate (GDP), unemployment rate (U), inflation rate (CPI), share of budget deficit in GDP (G) and share of current account deficit in GDP (CA). The points of macroeconomic stabilization pentagon are scaled in such way, that the better situations in the range of analyzed macroeconomic indexes, the farther from the system center are laid points marked on individual axes [Bukowski, (2003)].

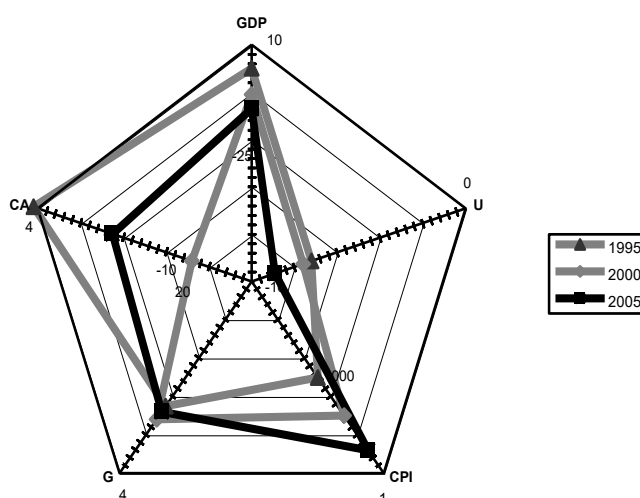


Figure 1. Macroeconomic stabilization pentagon for Poland in years 1995, 2000 and 2005

Source. The own study on the basis of data in table 1.

The macroeconomic stabilization pentagon for Poland characterized in analyzed years by area considerably differs from ideal regular pentagon. Nevertheless, in comparison to 1995, shape of figure appointed by suitable values of macroeconomic indexes in 2000 was in even smaller degree approximate to shape of regular pentagon. However, the shape of pentagon appointed by macroeconomic variables in 2005 year was in the largest degree approximate to form of regular pentagon, what testifies to increasing international competitiveness of Polish economy. Mentioned development tendencies confirm also the changes of index of economic freedom in years 1995-2005 [cf. table 2].

Table 2. Index of Economic Freedom (IEF) for Poland in years 1995-2005

Details	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Rank	66	75	71	54	50	52	50	44	61	55	42
Score	3,51	3,29	3,14	2,91	2,83	2,84	2,69	2,65	2,83	2,81	2,59
Trade policy	4,5	4,5	4,5	2	2	2	2,5	2,5	3	3	2,5
Fiscal burden	4,6	4,4	3,9	4,1	4,3	4,4	3,4	3,5	3,8	3,6	2,9
Government intervention	4	4	2	2	2	2	2	2	2	2	2
Monetary policy	5	5	5	5	4	4	3	3	3	2	1
Foreign investment	2	2	2	2	2	2	2	2	3	3	3
Banking and finance	3	3	3	3	3	3	3	2	2	2	2
Wages and prices	3	3	3	3	3	3	3	3	3	3	3
Property rights	3	2	2	2	2	2	2	2	2	3	3
Regulation	3	3	3	3	3	3	3	3	3	3	3
Informal market	3	2	3	3	3	3	3	3,5	3,5	3,5	3,5

Source: Heritage Foundation, <http://heritage.org>.

The levels of index of economic freedom for Poland characterized in years 1995-2005 considerable variation, but its value placed Poland on distant position among analyzed countries, what it thereby testifies to relatively low competitiveness of Polish economy on international arena. If, Poland in ranking of countries with the highest economic freedom took 66 position in 1995, then in 2005 Poland have placed on 42 position. Moreover, on the basis of data showed in above table, one may say, that Poland to 1997 was numbered among rather illiberal economies (*the mostly unfree*), and since 1998 among rather liberal economies (*the mostly free*).

3. Measures of international competitive position of Polish economy

The first of analyzed indexes of competitive position of Poland is the share of this country in world trade. The data showed in following table indicate, that Poland in more and more degree gets involved in international trade. What's more, gradual growth of Poland's commitment in world trade in years 1995-2005 is visible both on the export side, as well as on the import side. This confirms the thesis about growing international competitive position of this country [cf. table 3].

Table 3. The share of Polish export and import in world trade in years 1995-2005 [in %]

Share of Poland in:	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
World export	0,44	0,55	0,46	0,46	0,48	0,50	0,58	0,63	0,71	0,81	0,86
World import	0,55	0,60	0,74	0,75	0,78	0,75	0,77	0,82	0,87	0,94	0,94

Source: The own calculation on the basis of World Trade Organization data.

One of measures illustrating international competitive position of Poland is also balance of foreign trade in years 1995 – 2005. In this case, the gradually deepening deficit in foreign trade took place to 1998 year. It resulted from the higher dynamic growth of Polish import, in relation to dynamic growth of Polish export. The negative balance of foreign trade has gradually decreased since 1999 year, what testifies to growing international competitiveness of Poland [cf. table 4].

Table 4. Polish foreign trade in years 1995-2005 [in mln USD and in %]

Years	Export mln USD	Import mln USD	Balance mln USD	Trade Coverage Index w %
1995	22895	29050	-6155	78,8
1996	24440	37137	-12697	65,8
1997	25751	42308	-16557	60,9
1998	28229	47054	-18825	60,0
1999	27407	45911	-18504	59,7
2000	31651	48940	-17289	64,7
2001	36092	50275	-14183	71,8
2002	41010	55113	-14103	74,4
2003	53577	68004	-14427	78,8
2004	73781	88156	-14375	83,7
2005	89346	100900	-11554	88,5

Source: The own study on the basis of Central Statistical Office data.

Described above development tendencies confirm also the index changes of the import coverage by the export (TC_i - Trade Coverage Index), which belongs to relative measures of competitive position of the country. Namely, analyzing the value changes of trade coverage index it may notice the gradual growth of trade coverage index since 2000 year, what is also the symptom of gradual improvement of Polish competitive position.¹⁷

The one of the most often used measures of competitive position of given country is *Revealed Comparative Advantage Index* (RCA_i). It expresses relative advantage of country A in export of given good (group of goods) to country B (or the group of countries) in relation to the share of the country A in total export to the country B (or the group of countries). Following table shows the data concerning RCA indexes in Polish foreign trade in years 1995 – 2005 [cf. table 5].

¹⁷ Value of TC_i index show about export to import relation of given country and it is express in percent.

Table 5. Revealed Comparative Advantage Index (RCA_i) in Polish foreign trade in years 1995-2005 (by CN section)

CN sections	1995	2000	2003	2005
I Live animals; animal products	0,72	0,72	0,98	0,90
II Vegetable products	-0,24	-0,18	0,06	-0,04
III Fats and oils	-1,35	-1,10	-2,15	-0,88
IV Prepared foodstuffs	0,08	0,42	0,36	0,38
V Mineral products	-0,10	-0,76	-0,78	-0,80
VI Products of the chemical industry	-0,50	-0,65	-0,73	-0,66
VII Plastics and rubber and articles thereof	-0,75	-0,43	-0,35	-0,31
VIII Raw hides and skins, articles thereof	-0,07	-0,09	-0,24	-0,43
IX Wood and articles of wood	1,88	1,47	1,36	1,02
X Pulp of wood, paper, paperboard and articles thereof	-0,63	-0,10	0,05	0,01
XI Textiles and textile articles	0,25	0,29	0,00	-0,18
XII Footwear, headgear and articles thereof	0,65	0,58	0,10	-0,17
XIII Articles of stone, ceramic products, glass	-0,10	0,08	0,32	0,44
XIV Pearls, precious stones and metals, articles thereof	2,56	1,86	1,44	1,01
XV Base metals and articles thereof	0,80	0,43	0,17	0,09
XVI Machin. and mechan. applian., elect. engines equipment	-0,74	-0,28	-0,10	-0,12
XVII Transport equipment	0,57	0,32	0,18	0,45
XVIII Optical, photographic, measuring, checking instruments and thereof	-1,57	-1,27	-0,72	-0,76
XIX Arms and ammunition	0,65	-0,21	-1,62	-0,61
XX Miscellaneous manufactured articles	1,30	1,39	1,46	1,36
XXI Antics, collections	1,33	0,82	0,65	-0,46

a) RCA index was calculated according to equation:

$$RCA_i = \ln\left[\frac{x_i}{m_i} \div \frac{X}{M}\right] \quad (3.1)$$

where:

x_i – value of Polish export of commodity group „i”;

m_i – value of Polish import of commodity group „i”;

X – value of global Polish export;

M – value of global Polish import.

Source: The own study on the basis of Central Statistical Office data.

If indexes of revealed comparative advantage presented above are treating as measures of inter-industry competitiveness of Polish economy, then it is possible to affirm that competitiveness of Poland makes gradual improvement. In whole analyzed period Poland had revealed comparative advantage in the range of such commodities group as “live animals; animal products”, “prepared foodstuffs”, “wood and articles of wood”, “pearls, precious stones and metals, articles thereof”, “base metals and articles thereof”, “transport equipment” as well as “miscellaneous manufactured articles”. However, in the case of remaining commodity groups Poland did not have revealed comparative advantage in the whole of analyzed period. Moreover, in years 1995-2005 it took down the relative improvement of RCA indexes in the range of many commodities having essential share in the global Polish export (“machines and mechanic applicants., electric engines equipment”, “transport equipment”).

In the contemporary world economy greater and greater role plays intra - industry trade. It consists in simultaneous import and export of finished goods and their components come from the same industry by given country or group of countries in given period (Martin, Blanes, 1999). For the sake of specific structure of Polish trade, the intensity of intra-industry trade is so far comparatively high. It is confirmed by the data of next table [cf. table 6].

Table 6. Intra-industry trade indexes in Polish trade in years 1995-2005 (by CN section).

CN sections	1995	2000	2003	2005
I Live animals; animal products	0,68	0,66	0,45	0,63
II Vegetable products	0,77	0,89	0,99	0,92
III Fats and oils	0,21	0,17	0,05	0,54
IV Prepared foodstuffs	0,63	0,72	0,90	0,87
V Mineral products	0,65	0,73	0,58	0,57
VI Products of the chemical industry	0,53	0,36	0,39	0,63
VII Plastics and rubber and articles thereof	0,50	0,52	0,61	0,79
VIII Raw hides and skins, articles thereof	0,98	0,81	0,85	0,73
IX Wood and articles of wood	0,20	0,39	0,42	0,58
X Pulp of wood, paper, paperboard and articles thereof	0,46	0,56	0,71	0,94
XI Textiles and textile articles	0,91	0,97	0,97	0,85
XII Footwear, headgear and articles thereof	0,55	0,86	0,90	0,85
XIII Articles of stone, ceramic products, glass	0,77	0,72	0,92	0,85
XIV Pearls, precious stones and metals, articles thereof	0,13	0,34	0,46	0,58
XV Base metals and articles thereof	0,73	1,00	0,94	0,98
XVI Machin. and mechan. applan., elect. engines equipment	0,48	0,72	0,93	0,88
XVII Transport equipment	0,85	0,97	0,99	0,84
XVIII Optical, photographic, measuring, checking instruments and thereof	0,27	0,39	0,56	0,58
XIX Arms and ammunition	0,51	0,24	0,08	0,65
XX Miscellaneous manufactured articles	0,47	0,48	0,39	0,45
XXI Antics, collections	0,47	0,92	0,92	-
Average	0,56	0,64	0,67	0,70

a) IIT index was calculated according to equation:

$$JIT = \frac{(x_i + m_i) - |x_i - m_i|}{x_i + m_i} \quad (3.2.)$$

where:

all symbols like in previous equation.

Source: The own study on the basis of Central Statistical Office data.

In years 1995-2005 intensity of intra-industry trade in global Polish trade was on relatively high level. Furthermore, in the case of majority commodity groups it was observed, gradual growth of this intensity. Taking into account the average intensity of Polish intra-industry trade one should affirm, that in global Polish trade have changed relations between intensity of extra-industry and intra-industry trade, in second favour. In 2005-year average intensity of intra-industry trade have increased in relation to 1995 from 56% to 70%.

The next measure of international competitive position of economy is international investment position. The net international investment position is the difference between foreign assets and foreign liabilities and it shows, whether the given country is the net creditor or the net debtor in relation to abroad.

The net international investment position of Poland in years 1995-2005 was negative, what marks that Poland was net debtor in relation to abroad in analyzed period. This is the typical situation for countries with open market economy, in the phase of fast economic development. Next, the relation of the net international investment position to GDP of Poland increased from 20,1 % in 1995 to 43,0 % in 2005. About the relative deterioration of the net international investment position of Poland decided the first of all essential increase in

foreign direct investment and portfolio investment inflow do Poland [cf. table 7].

Table 7. International investment position of Poland in years 1995-2005 [in mln USD and in %]

Details	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
International investment position	-27 338	-29 769	-30 531	-41 788	-49 158	-55 164	-57 731	-73 424	-93 659	-127 498	-123 920
Assets	31 966	28 746	31 908	38 399	40 100	44 835	49 397	51 704	58 556	79 155	92 201
Liabilities	59 304	58 515	62 439	80 187	89 258	99 999	107 128	125 128	152 215	206 653	216 121
International investment position in relation to GDP in %	-20,1	-19,4	-21,7	-23,8	-31,7	-31,9	-30,8	-33,5	-38,8	-45,9	-43,0

Source: Data of National Polish Bank.

Moreover, to estimation the international competitiveness of the country are also used such indexes as the balance of foreign direct investments in absolute and relative forms (per capita and in relation to GDP). Suitable data are presented in following table [cf. table 8].

Table 8. Absolute and relative amounts of foreign direct investment in Poland in years 1995-2005

Details	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Inward stocks of foreign direct investment in mln USD	7843	11463	14587	22461	26075	34227	41247	48320	55268	61427	71029
Inward stocks of foreign direct investment per capita w USD	203,2	297,0	377,9	580,4	673,8	886,7	1079,8	1264,9	1450,6	1612,3	1864,3
Inward stocks of foreign direct investment in relation to GDP in %	5,2	7,5	9,5	13,2	15,9	20,5	22,2	25,2	26,4	25,4	28,5

Source: The own study on the basis of Central Statistical Office data.

The inward stocks of foreign direct investment in Poland characterized by increasing trend in analyzed period. The similar situation took place in the case of inward stocks of foreign direct investment in Poland per capita and in relation to GDP. The growth of these indexes goes to show about increasing international attractiveness of Polish market and thus about growing competitiveness of Polish economy in years 1995 – 2005.

Sometimes the expression of international competitiveness of economy is identified with exchange rate changes of given country. In this case the comfortable tool for practical analysis of competitiveness is the real, effective exchange rate, which expresses external price of given currency with respect to currencies of main trade partners of given country, after elimination the inflation in home and abroad [Jasiński, (2003)].

On the basis of analysis of the real, effective exchange rate of Polish zloty in years 1995-2005, it can perceive comparatively high stability of exchange rate of Polish currency, with insignificant tendency to appreciation. Such exchange rate changes of Polish zloty point at comparatively slow increasing of international competitive position of Poland in analyzed period [cf. figure 2].

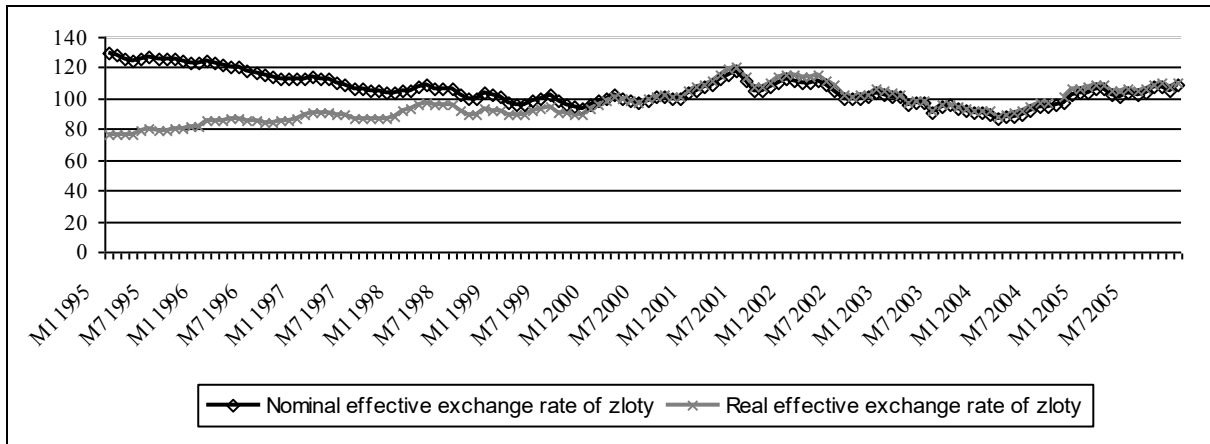


Figure 2. Nominal and real effective exchange rate changes of Polish zloty in years 1995-2005 (year 2000 equals 100)

Source: International Financial Statistics, IMF.

The index of real, effective exchange rate changes expresses crucial aspect of current competitiveness of given economy. The exchange rate has substantial influence on foreign trade in a short time, however its meaning in analysis of competitiveness of economy is smaller in a long time.

On the basis of analysis of selected indexes of the international competitiveness and competitive position of Polish economy one may say, that the competitiveness of Poland was on relatively low level in years 1995 – 2005. What's more, in analyzed period, the international competitiveness of Polish economy improved generally, but the largest growth of Polish competitiveness took place in 2005. Relatively low international competitiveness of Polish economy was mainly determined by internal factors (e.g. the difficult situation in public finances, weakly developed economic infrastructure etc.) as well by external factors (e.g. growing prices of petroleum on the world market, decreasing flows of FDI in the world etc.).

Analyzing changes of indexes of international competitiveness and competitive position of Polish economy, it is necessary to be conscious of indexes disadvantages. Thereby, one should be conservative in formulation the conclusions and recommendations concerning economic policy of given country.

To the basic shortcomings of measures of international competitiveness and competitive position of economy are numbered the comparatively casual relationships with theory of international trade, fragmentariness and arbitrariness in making the opinions as well as the limited usefulness for constructing the foundations of the future economic policy [Misala, (2005)].

4. Conclusions

On the basis of conducted analysis, one may say, that the international competitiveness and competitive position of Polish economy is yet relatively low (e.g. in comparison to the most economically developed EU members). However, in years 1995-2005 took place gradual growth of competitiveness and competitive position of Poland, what it was confirmed by favorable changes of analyzed competitiveness indexes.

The possibilities of international competitive growth of Polish economy are depended on that, whether Poland will fully use existing chances resulting from the membership in European Union. Moreover, improvement of the international competitiveness of Poland is depended on the possibilities of developmental barriers overcoming, such as the reform of public finances, continuation of structural reforms, increasing the elasticity of the labour market and reorientation of economic policy towards the knowledge based economy.

It is necessary to emphasize, that the growth of competitive ability of Polish economy will be only possible thanks to suitable economic policy focused on competition protection and favorable climate creation for companies' development (especially micro, small and medium firms). The economic policy should also characterize greater elasticity, what will enable quick adaptation to changing conditions in international environment.

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ASSESSMENTS REGARDING METHODOLOGY AND THE SIGNIFICANCE OF THE MAIN MACROECONOMIC INDICATORS

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Abstract

This paper highlights a parallelism between the methodology of determining the macroeconomic factors used in Romania before and after 1990. It is known that before 1990, the Romanian statistics used a methodology which was based on the Material Production System (MPS) in order to determine the macroeconomic indicators (social product, national income). Taking into consideration the experience of the occidental countries and Romania's intention to integrate in the European Economic Community, the Romanian statistics has adopted and gradually introduced after 1990 the National Accounts System (NAS), which is used in the European Community. This article will reveal some aspects regarding the characteristics of the two systems, as well as some observations which aim at the methodology which is used within these systems in order to determine the macroeconomic indicators. Thus, the main characteristics of the methodology of Material Production System are presented together with a particularization of the components of the Global Social Product. Consequently, the characteristics of the methodology of the National Accounts System are highlighted, emphasizing the calculation of the Gross Domestic Product. A parallelism between the calculations of the two indicators is conducted, indicating which components are included in each calculation.

Keywords: social product, gross domestic product, material production system, national accounts system

1. Introduction

It is known that before 1990, the Romanian statistics used a methodology which was based on the Material Production System (MPS) in order to determine the macroeconomic indicators (social product, national income). The balances of the national economy were used within this system as practical instruments for the summarization of the statistic data. This system was used on a large scale by the socialistic countries, which had a planned economy.

After 1990, once the socialist system collapsed, there has been a gradual series of radical transformations in the Romanian economy, thus foreshadowing more and more conspicuously, the components of an economy based on the free exchanged, which is specific for capitalist economies. The fundamental principles and laws, which acted according to the new conditions, would entail – as an objective necessity – the change of the assessment system and of the quantification system for the national economy resources. This fact had a direct influence over the structure and dynamics of the macroeconomic indicators.

Taking into consideration the experience of the occidental countries and Romania's intention to integrate in the European Economic Community, the Romanian statistics has adopted and gradually introduced after 1990 the National Accounts System (NAS), which is used in the European Community.

This article will reveal some aspects regarding the characteristics of the two systems, as well as some observations which aim at the methodology which is used within these systems in order to determine the macroeconomic indicators.

2. The main characteristics of the Material Production System (MPS)

We shall characterize this system by mainly focusing on the use of its components within the calculation of the Social Product (SP) and National Income (NI).

It is known that one of the essential traits of the MPS has been the structure of the national economic branches in two main categories:

- The material production sphere – which consists of the goods production branches (production means and consumption goods);
- The services sphere (was considered for a long time a non-productive sphere) – which contains the educational system, health care system, cultural system and sports system, etc.

Within the Social Product and implicitly within the National Income the results of the branches integrated in the material production sphere were taken into consideration, but not completely (as in the case of Transport and Commerce, for example). Because of this, the level of the two indicators do not completely reflect the results of the activity specific to every branch, which entered the economic circuit, regardless of their form – material or immaterial – whose purpose was the satisfaction of a social needs, as goods. From the same reason, the international comparability of the level of the two indicators was affected.

By analyzing the calculation methodology of the Social Product a series of aspects appear, which deepen the discrepancy between the level of this indicator and that of the real result, which it should have synthesized.

There are at least two types of social product:

- Global social product;
- Final social product.

The Global Social Product (GSP) – is determined as being the sum of the global products (GP) which are achieved within the branches of the material production sphere([2]):

$$GSP = \sum GP_i \quad (2.1)$$

where

i represents the number of branches within the material production sphere.

E.q. (2.1) is valid only for industrial branches.

If we only focus on this type and go on with representing the methodological line, the global product from any branch is also determined as being the sum of the global productions (Pg) achieved within a year by the companies which belong to the respective branch:

$$GP_i = \sum Pg_{ij} \quad (2.2)$$

where

GP_i = global product from branch i ;

Pg_{ij} = global production of the companies belonging to branch i ; j =the number of these companies.

Finally, the global production of each company had the following calculation relation ([3]):

$$Pg = A + S_t + L_t + (S_2 - S_1) + (N_2 - N_1) + (M_2 - M_1) \quad (2.3)$$

where

A = the value of the final products, which are finished within a given period (month, trimester, year);

S_t = the value of the half-finished materials from the personal production, delivered to third parties or destined for selling;

L_t = the value of the industrial works, completed for third parties;

$S_2 - S_1$ = the variation of the semi-finished inventories from the personal production, destined for internal productive consumption;

$N_2 - N_1$ = the variation of the inventories from the unfinished production;

$M_2 - M_1$ = the variation of the matrixes, patterns, tools, devices inventories, from the personal production.

It is worthy to notice that:

- S_1 , N_1 and M_1 = existing inventories at the beginning of the period;
- S_2 , N_2 and M_2 = inventories at the end of the period;

The production with a manufacturing cycle which exceeds a month's period was considered unfinished production

If the first three elements, respectively A , S_t and L_t , could be altered on a small scale, the other elements of global production had a rather high level of uncertainty, because the control of the exactness of the respective inventories level was very difficult to achieve. Usually, the tendency to increase the fictive inventories level at the end of the period manifests itself, so that the variation of the inventories should bear the sign "+". There had become notorious some situations in which the level of global production had increased so much that the discrepancy between figures and reality was strikingly big. These shortcomings were transferred on the methodological line up to the level of the global social product.

3. The main characteristics of the National Accounts System (NAS)

In contrast to the MPS, within the NAS, for the calculation of the macroeconomic indicators, one takes into consideration the results of all economic units, which have entered the economic circuit, as goods.

The activity branches are classified in three categories:

- Branches which produce goods and services for the market;
- Branches of the general government which produce non-market goods and services;
- Branches of the non-profit institutions with activities in the household service, which produce non-market goods and services.

The National Accounts System (NAS 93) offers a classification of the activities according to the International Standard Industrial Classification-*ISIC*, which is made by the Statistics Office of UN. This classification represents the basis for the systems used in every country, thus guaranteeing the methodological unity and comparability of the data.

The European Union uses the *NACE* classification (Classification of Economic Activities in the European Community) and Romania uses the Classification of the National Economic Activities (*CNEA*), which is absorbed by *ISIC* and *NACE*.

Within the NAS, the methodology used for the calculation of the macroeconomic indicators is different from the one used in the Romanian system before 1990. Consequently, the shortcomings of that system have been completely eliminated.

If we only refer to the Gross Domestic Product (*GDP*), by using the National Accounts a final source for summarized data at the national economic level, there have been created three possibilities to quantify the level of this indicator, i.e.:

a) Production approach (or value added approach) – implies the aggregation of the gross value added (*GVA*) which corresponds to the activity branches. According to this approach, the *GDP* is expressed using the prices of the production factors. The calculation relation is ([1]):

$$GDP_{pf} = \sum_{i=1}^k GVA_i \quad (3.1)$$

where

i represents the number of goods and services producing branches.

In its turn, the Gross Value Added, determined at the level of each branch is obtained by eliminating the intermediate consumption (i.e., the productive domestic consumption) from the Global Product, thus the calculation relation would be ([1]):

$$GVA_i = GP_i - C_i \quad (3.2)$$

where

C_i represents the intermediate consumption.

Therefore we met again the Global Product indicator. But this time its calculation is not only based on using the global production, as in the case of *MPS*, to which we made reference in the previous pages.

In order to determine the *GP*, one takes into consideration not only the elements of goods production ($A + S_t + L_t$) from the old global production. On the other hand, the area of the branches for which the global production is calculated, is much larger, as it contains the complete results of these branches and in addition, a series of activities which are ignored in the *MPS*, such as the activities in hotels and restaurants, transport, storage and communication, financial brokerages, real estate transactions, public administration, education, health care, etc.

b) Final usage approach (or the expenditure approach) – implies the aggregation of the components which express the final usage of goods and services, respectively: personal consumption (private) – *PC*, public consumption – *PLC*, gross formation of capital – *GFC*, net export (Export - Import sale) – *NEX*.

The calculation relation is ([5]):

$$GDP_{mp} = PC + PLC + GFC + NEX \quad (3.3)$$

Remark. The obtained *GDP* is expressed using current market prices.

c) The income approach – consists of the aggregation of the elements which express the compensation of the production factors, which are materialized in: wages, interests, annuities, profits, allowances for the fixed capital consumption, pay-offs, indirect taxes, production and import-related taxes, exploitation and import subsidies (are taken out).

The calculation relation is ([5]):

$$GDP = C + GOS + NIT + OTP - OSP \quad (3.4)$$

where

C = compensation of employees;

GOS = *NOS* + *AFCC* = gross operating surplus;

NOS = net operating surplus;

AFCC = allowances for the fixed capital consumption;

NIT = net indirect taxes;

OTP = other taxes on production;

OSP = other subsidies on production.

The range of macroeconomic indicators which can be calculated within the National Accounts System is very large, which entirely covers the informational requirements of all decisional factors. Thus, we can enumerate: the Gross National Product, the Net National Product, the Gross Disposable Household Income, the Gross Disposable Income, etc.

4. Conclusion

The two systems MPS, NAS respectively, aim at highlighting the results of the economic activity, the connections between the structural elements of the economy, the dimensions, proportions and rhythms of the development, but regarding the content of the measured categories and the interpretation of the production sphere, they greatly differ from each other. The material production system considers that the object of the research is the material production sphere, while the national accounts system – the entire economic activity. Therefore, the main difference is given by the type of interpretation and inclusion in the calculations of the services sphere.

MPS is based on the Marxist conception according to which the production activity resumes to material goods production (industry, agriculture, commerce, etc.) and productive services (repairs, goods transportation, commerce, etc.), on one hand, and on the other, it resumes to the fact that only labour creates new value.

Starting from this conception, the material production sphere which creates value contains only branches which directly produce material goods and branches whose activity determines or supports the evolution of the production process. “Unproductive services” which are obtained in the “non-material branches” are education, health care, culture, administration, defense, public order, etc, to which we add the state and the private households, which are considered non-productive, by considering that they do not contribute to the production of the national income and they only consume it. “Non-material services”, which according to the MPS does not bring national income, but it creates gross domestic product, according to the national accounting, include: general government services; educational services; instruction and health care; credit units and insurance services; renting of movable and immovable assets. The services from the non-material sphere are not included in the production in the MPS, even if they are the result of the secondary activities conducted by the units which are included in the material sphere.

Both the limited definition of the concept of production in MPS in comparison with NAS and the ignorance in the MPS of the other production factors apart from labour, determine the background difference between the two systems, which is materialized by the fact that the national income calculated in the MPS is much smaller than the corresponding indicator from the NAS with value added in the sphere of non-material services (and considered to be non-productive in the MPS).

In the MPS, on the other hand, the material expenditures relevant for the non-material services do not distinguish themselves in the productive consumption of the material sphere, this consumption being included in the value added.

From the limited delimitation of the production in MPS derives the existence of the institutional sectors, in the sense defined by the NAS. This happens because of the fact that the state and the private households are considered not to create value.

We underline the fact that by the adoption of the NAS by the Romanian statistics, even from the first years after 1989, we can definitely claim that – from this point of view – Romania has integrated in the European Union long before January the 1st 2007.

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RETHINKING THE BUSINESS PROCESS THROUGH REENGINEERING

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Abstract:

Rethinking business through reengineering is based on the assumption that to meet contemporary demands of quality, service, flexibility, and low cost, processes must be kept simple. Examples of simplifying processes are combining several jobs into one, letting workers make decisions, performing the steps in a process in a natural order, and performing work where it makes the most sense. The net result is that work may be shifted across functional boundaries several times to expedite its accomplishment. Traditional inspection and control procedures are often eliminated or deferred until the process is complete, providing further cost savings.

The authors, focusing their research on enterprises from Oltenia Region, demonstrate how reengineering can be carried out in a variety of corporate settings. But although workers are the ones who need to be empowered to carry out reengineering, the authors are adamant that the process must start at the top. This is because it involves making major changes that are likely to cut across traditional organizational boundaries. Those empowered to make the changes at lower levels must know they have the support of top management, or change won't occur.

Keywords: reengineering, rethinking business processes, regional economy, leadership, organization

1. Introduction. Regional irregularities towards 2010

The fundamental objective of the policies of regional development is the reduction of territorial disparities, the achievement of a balance between the levels of economical and social development of different areas.

An objective of the regional policy which characterizes this period is to facilitate the structural and sectorial adjustments, to support the restructuring processes and economic re-launching, to remake and stimulate the regional competitive capacity, to support the European integration processes.

Most countries, including the ones with developed economies, face regional irregularities, and, as a consequence, apply regional development strategies and policies. We must take into consideration the difficulties caused by the regional irregularities and the possibilities to solve them cannot be approached without taking into consideration the general development level of each region.

The eight regions present certain particularities as far as their economic structure is concerned, which makes certain sectors play a decisive part in their future development. Thus, the economy of the regions in the south of the country (South – East, South – Muntenia, South – West Oltenia) is influenced by the evolution of the agricultural sector, with important majority of over 15%, which leads to a bad development in the years with bad weather conditions. Also, there are regions with important touristic potential (areas in the North – East and South – East, etc.), the economic evolutions of these areas being influenced by the usage level of this potential. Another peculiarity is represented by the areas where the extraction industry has an important role (Jiu Valley basin from the South region – West Oltenia) and where the economy was affected by the restructuring process of the mining sector.

2. Critical analysis regarding the present business development stage in South-West Oltenia Region

South – West – Oltenia region has an average of the GDP/ total economy of approximately 8%. In this region, **agriculture** plays an important part, with an average of 18%. Also, **industry** plays an important part in the regional economy, supplying approx. 30% of the regional GDP. The main industrial domains in the region are: Non- iron manufacture (aluminium production), electrotechnical industry (Electroputere SA Craiova – locomotives), industry of making agricultural machines and tractors, chemical industry, light industry (textiles and footwear), building materials, food industry. **Constructions** are over the national average (6%), representing around 6,5% of the regional GDP. In the **services** area, with a contribution in the GDP of only 39%, way below

the national average (over 45%), we notice education, health, social work, public administration and defense, with a contribution of 12% and real estate with over 9%.

As a result of some obvious structural misbalances, as well as of the lack of economic performance and competitiveness, the **employed population** followed an ongoing decrease up to 2005, when most counties in the region increased, except for Gorj county which continues to decrease because of the mining industry which is being restructured.

In 2005 the South- Western region contributed 10,1% to the total **employment rate** and held 14,0% of the total employment rate.

Agriculture represents one of the main occupation of the inhabitants, the agricultural jobs being 42,1%, second place after the North Eastern. Services hold 32% (commercial services 18,9% and social services 13,1%) and the industry and construction hold 25,9%.

For the following period, at the regional level, estimations regarding the GDP show evolutions above the national average in the regions with a lower development level (North- East, South, etc) and equal rhythms or under the national level in the regions with a greater development degree.

The annual evolutions of the regional GDP are supported by the increase of the activity in all domains. To be noted evolutions in construction, with an average annual rhythm of over 10% in all regions. Also, the services sector will support the economic growth of each region, the annual average rhythm during 2007 – 2010 going over 6%, but, because of the present capacities, the industry remains the sector where different growth rhythms contribute to proximity tendency.

This evolution of the economic growth at the regional level does not lead to significant changes of the regional contribution to the national GDP on an average term, differences being 0,1-0,2 percent points, some regions maintaining its current level (South, South West Oltenia, North – West). Thus, for the year 2010, Bucharest still remains the most important contributor (21%), the regions South, North- West and Central with 12 - 12,5% contributions, and the regions North East and South East with 11,9% and 11,4% of the total GDP.

Although up to the year 2010 there are no foreseen structural changes, still two tendencies are to be noted: - as a result of the consistent growing rhythms of the regional DP in construction, their average in the regional GDP follows a growing tendency, in the year 2010 its values being 7,8% in the Southern region and 10,7% in the South West;

- the services will increase the GDP of every region, going over 40% in all regions, almost 49% in the Northern region and 49.5% in the North Western region. In Bucharest region the GDP level will go over 65% in 2010.

Table 1. Evolution of the main economic and social indicators during 2005 – 2010, in the South – Western Oltenia - percentual changes -

	Average	Dolj County	Gorj County	Mehedinți County	Olt County	Vâlcea County
2005						
Real increase of GDP	1,5	3,7	0,0	-2,0	3,7	0,2
GDP /Inhabitant - euro	2999,6	2954,6	3757,2	2686,6	2503,2	3182,8
Employed population at the end of the yr	1,0	1,1	-2,7	1,7	2,3	2,3
Average number of employed people	-0,5	-1,0	-5,4	1,7	0,6	3,5
Unemployment rate - %	7,4	6,3	9,3	9,5	7,1	6,6
Average net wages	21,2	20,6	30,6	14,2	21,2	16,7
2006						
Real increase of GDP	9,0	9,0	9,2	7,1	9,6	9,1
GDP /Inhabitant - euro	3730,6	3671,7	4674,2	3292,3	3142,2	3958,9
Employed population at the end of the yr	0,0	0,4	-1,2	0,1	0,3	0,0
Average number of employed people	0,1	-0,5	-1,2	1,1	0,6	1,3
Unemployment rate - %	6,9	6,0	9,0	8,8	6,8	5,9
Average net wages	12,3	14,6	12,1	11,2	11,2	11,2
2007						
Real increase of GDP	6,4	6,7	5,7	7,4	5,8	6,8
GDP /Inhabitant - euro	4465,9	4405,4	5534,6	3985,3	3753,2	4747,1
Employed population at the end of the yr	0,0	0,3	-1,0	0,1	0,2	0,1
Average number of employed people	0,5	-0,3	-0,7	1,6	0,8	1,6
Unemployment rate - %	6,8	5,8	8,8	8,7	6,7	5,8
Average net wages	16,8	19,1	15,6	18,0	15,6	15,6

	Average	Dolj County	Gorj County	Mehedinți County	Olt County	Vâlcea County
2008						
Real increase of GDP	6,0	6,0	5,4	6,3	6,2	6,2
GDP /Inhabitant - euro	5163,7	5085,9	6362,8	4628,5	4355,2	5501,7
Employed population at the end of the yr	0,1	0,2	-0,6	0,2	0,3	0,1
Average number of employed people	0,5	0,0	-0,4	1,1	1,0	1,0
Unemployment rate - %	6,7	5,7	8,7	8,6	6,6	5,6
Average net wages	13,0	13,7	13,1	13,1	12,6	12,6
2009						
Real increase of GDP	5,9	5,9	5,3	6,2	6,1	6,0
GDP /Inhabitant – euro	5823,4	5742,1	7147,8	5248,1	4913,0	6199,9
Employed population at the end of the yr	0,1	0,3	-0,5	0,1	0,2	0,1
Average number of employed people	0,6	0,1	0,0	1,1	1,0	1,3
Unemployment rate - %	6,7	5,7	8,7	8,5	6,5	5,6
Average net wages	10,1	11,0	9,4	10,2	9,4	10,5
2010						
Real increase of GDP	5,8	0,9	5,3	6,1	6,1	5,9
GDP /Inhabitant - euro	6561,1	6464,3	8019,3	5940,2	5546,0	6994,5
Employed population at the end of the yr	0,01	0,2	-0,3	0,1	0,1	0,0
Average number of employed people	0,6	0,1	0,0	1,0	1,0	1,1
Unemployment rate - %	6,6	5,6	8,7	8,4	6,4	5,5
Average net wages	7,9	8,2	7,0	8,0	7,8	8,7

3. The Reengineering – Efficient Solution for Basic Restructuring of Business in Oltenia Region

Business process reengineering is one approach for redesigning the way work is done to better support the organization's mission and reduce costs. Reengineering starts with a high-level assessment of the organization's mission, strategic goals, and customer needs.

Basic questions are asked, such as "Does our mission need to be redefined? Are our strategic goals aligned with our mission? Who are our customers?" An organization may find that it is operating on questionable assumptions, particularly in terms of the wants and needs of its customers. Only after the organization rethinks *what* it should be doing, does it go on to decide *how* best to do it.

Within the framework of this basic assessment of mission and goals, reengineering focuses on the organization's *business processes* – the steps and procedures that govern how resources are used to create products and services that meet the needs of particular customers or markets. As a structured ordering of work steps across time and place, a business process can be decomposed into specific activities, measured, modelled, and improved. It can also be completely redesigned or eliminated altogether. Reengineering identifies, analyzes, and redesigns an organization's core business processes with the aim of achieving dramatic improvements in critical performance measures, such as cost, quality, service, and speed.

Reengineering recognizes that an organization's business processes are usually fragmented into sub-processes and tasks that are carried out by several specialized functional areas within the organization. Often, no one is responsible for the overall performance of the entire process. Reengineering maintains that optimizing the performance of sub-processes can result in some benefits, but cannot yield dramatic improvements if the process itself is fundamentally inefficient and outmoded. For that reason, reengineering focuses on redesigning the process *as a whole* in order to achieve the greatest possible benefits to the organization and their customers. This drive for realizing dramatic improvements by fundamentally rethinking how the organization's work should be done distinguishes reengineering from process improvement efforts that focus on functional or incremental improvement.

Enterprises need to define their strategic direction (*where* they need to go and *what* they need to accomplish) before expending time and resources on improving *how* they do their work. Only then can an enterprise be in a position to assess whether its activities, business processes, and resources are properly aligned to support its mission and achieve desired outcomes.

As will be emphasized in this paper, reengineering is not a panacea. There are occasions when functional or incremental improvements are the method of choice, as when a process is basically sound or when the organization is not prepared to undergo dramatic change.

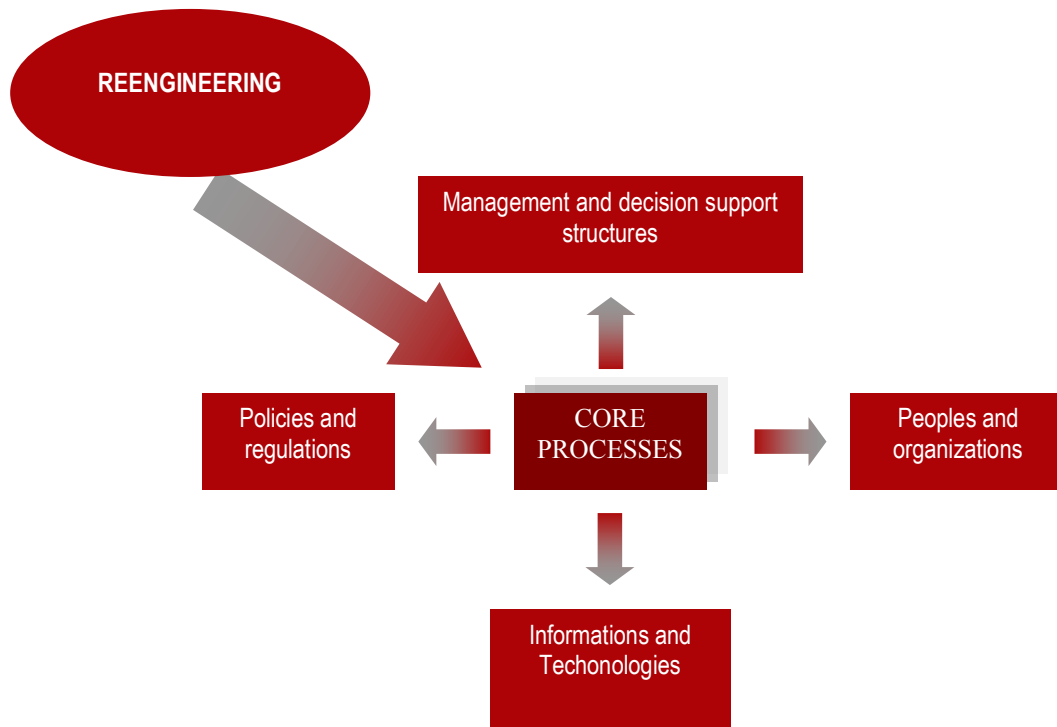


Figure 1. The Reengineering and his changes
Sources: www.prosci.com

Because so many issues are interconnected in reengineering (see Figure1), initiators need to scope their assessments broadly and take a holistic view of the effort. *For example*, an enterprise that is in the midst of designing a new process should have previously laid a solid foundation for change by clarifying its mission, identifying customer and stakeholder needs, assessing performance problems, setting new performance goals, and determining that reengineering is an appropriate approach to take. Even implementation issues need to be considered in the early stages of the project, so that executives can begin preparing the enterprise for changes in goals, values, and responsibilities.

Furthermore, although the main key reengineering issues in this paper are presented in a sequence, many of them include activities that should be occurring throughout the reengineering effort. For example, strong executive leadership in leading the effort and managing change (issue 3) should be a constant force from start to finish. Without it, even the best process design may fail to be accepted and implemented. Similarly, the business case for reengineering (issues 3 and 6) should be a dynamic document that is periodically updated to reflect changes in costs, benefits, risks, customer needs, agency priorities, and other key factors.

4. Reengineering Framework. The main key reengineering issues

Enterprises from Oltenia Region are being challenged to reduce the costs while improving their performance. As noted by McCaffery and Jones (2004) in *Budgeting and financial management for national defense*, achieving major levels of cost savings and performance improvement nearly always requires that enterprises redesign the business processes they use to accomplish their work. Many of the largest enterprises from Oltenia Region find themselves encumbered with structures and processes rooted in the past, aimed at the demands of earlier times, and designed before modern information and communications technology came into being. These enterprises are poorly positioned to fulfill their mission and meet their strategic goals.

Reengineering starts with a high-level assessment of the organization's mission, strategic goals, and customer needs. Basic questions are asked, such as "Does our mission need to be redefined? Are our strategic goals aligned with our mission? Who are our customers?" An organization may find that it is operating on questionable assumptions, particularly in terms of the wants and needs of its customers. Only after the organization rethinks what it should be doing, does it go on to decide how best to do it.

In the following figure we try to synthesize the typically elements emphasized in process redesign and reengineering methodologies. The assessment questions deal with issues and activities that reengineering practitioners have found to be critical in defining reengineering opportunities and goals, ensuring that reengineering projects are well managed, maximizing the return on resources invested in reengineering (including information systems), and managing the many changes needed to implement a redesigned work process.

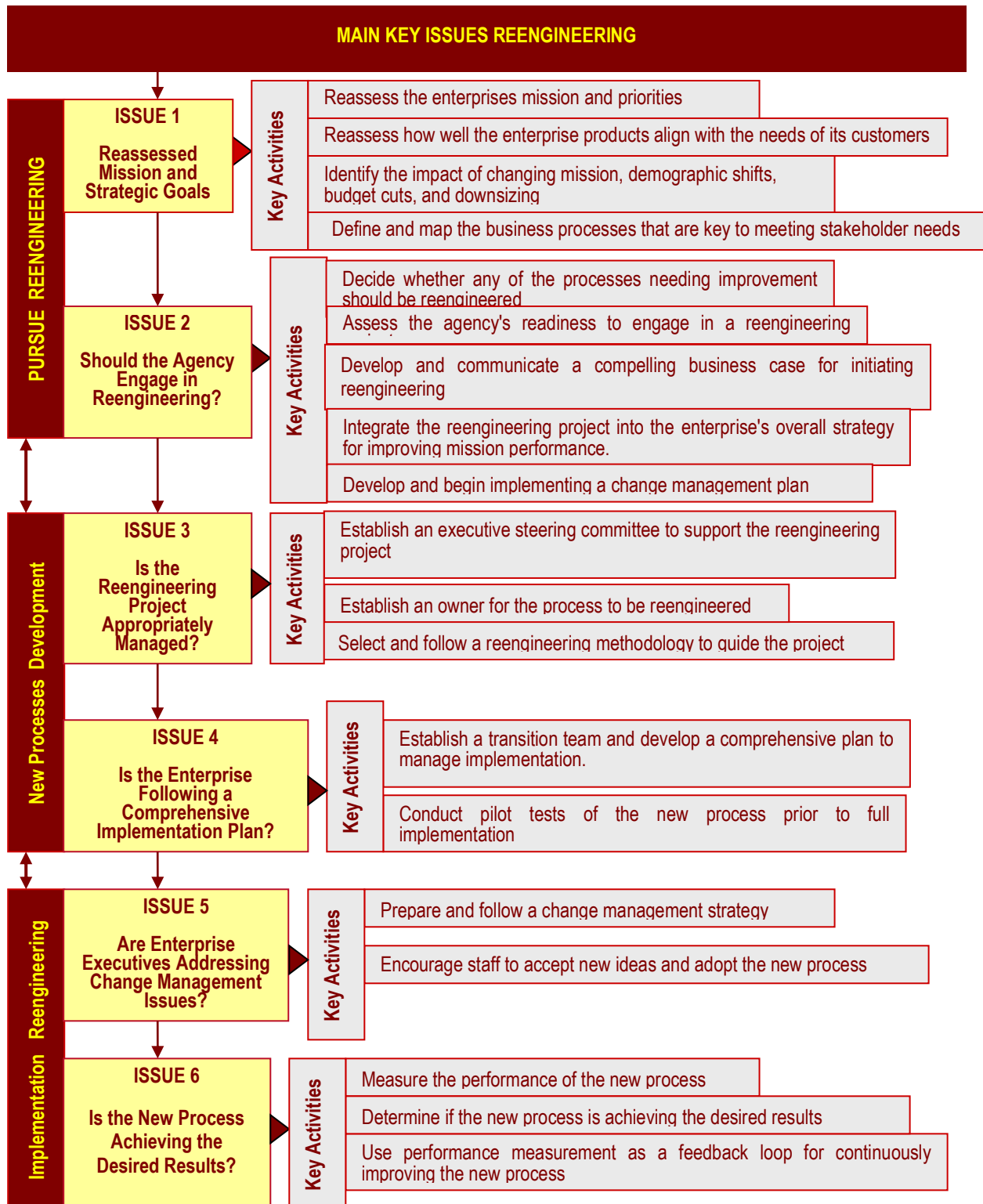


Figure 2. A framework for reengineering enterprises

To develop this framework, we reviewing the growing body of literature and methodologies on process redesign [Arun, (2001); Becker, Kugeler, Rosemann, (2003); Davis (2005); Raijers, (2005)] and reengineering [Harrel, Walker, Powers, (2003), Waltson, Burns, Kimberly (2000)] that have been published by consulting firms [Rockford Consulting, Prosci Learning Center], and individual researchers and practitioners.

Under each of the six issues, we list several key activities that the enterprise typically should do to develop the information, manage the risks, and make the decisions needed at that point. For each phase, we provide a short discussion highlighting its significance. Because reengineering is very situational, all these activities are framed at a high level, delineating the general line of inquiry that initiators should pursue.

Pursue Reengineering focuses on strategic and general management issues that need to be resolved before an enterprise embarks on a reengineering project. New Process' Development picks up at the point where the enterprise has decided to begin a reengineering project. The assessment issues focus on the management of the reengineering team, the team's process redesign activities, and the business case it develops to support a decision to begin implementing the new design. Implementation Reengineering deals with the problems involved in piloting and deploying a new business process. Both the human and technical issues surrounding implementation are touched on, along with the need to evaluate the performance and results of the new process.

The key issues and activities identified by us to be necessary for success in performing reengineering are commonly accepted by most experts. In addition, optional activities proposed by a variety of management consulting firms who have had success assisting their clients also included. These issues, activities and assessments are identified to help organizations from Oltenia region to decide how they should perform reengineering.

In our opinion, the **Reengineering Recommendations** for organizations from Oltenia Region are:

- BPR must be accompanied by strategic planning, which must address leveraging IT as a competitive tool;
- Place the customer at the center of the reengineering effort – concentrate on reengineering fragmented processes that lead to delays or other negative impacts on customer service;
- BPR must be “owned” throughout the organization, not driven by a group of outside consultants;
- Case teams must be comprised of both managers as well as those will actually do the work;
- The IT group should be an integral part of the reengineering team from the start;
- BPR must be sponsored by top executives, who are not about to leave or retire;
- BPR projects must have a timetable, ideally between three to six months, so that the organization is not in a state of “limbo”;
- BPR must not ignore corporate culture and must emphasize constant communication and feedback.

5. The most common business reengineering success and failure factors

According to Hammer, there a number of common pitfalls that company's fall into while reengineering key business processes. These include

- **Trying to fix a process instead of changing it.**
- **Ignoring everything except process redesign.** Sometimes reengineering teams fail to address needed changes in job designs, management systems and organizational structures that are required for a successful outcome.
 - **Neglecting people's values, beliefs and the corporate culture.**
 - **Placing prior constraints on the definition of the problem and the scope of the reengineering effort.** An example might be defining the problem in the context of the way the company is doing business today, not the way it will need to do business in the future. Reengineering is not simply about making a process faster or more efficient, though ROI (Return on Investment), ROA (Profit/Assets) and ROM (Management) are important measures of success.
- **Trying to make reengineering happen from the bottom up.**
- **Concentrating exclusively on design, to the exclusion of actual implementation through pilot or full blown projects.**

BPR is not just for large corporations. Personally, I have worked with a number of small to mid size local companies that failed to anticipate change brought about by economic downturn, deregulation and stringent customer quality expectations. One of our goals is to help prospective clients reengineer key business processes in order to thrive in a changing environment. Another goal is to help our clients leverage and expand their information technology to address their reengineering needs.

In 1996 Davenport published an article entitled *Why Reengineering Failed: The Fad that Forgot People* in which he reports: To most business people in the United States, reengineering has become a word that stands for restructuring, lay-offs, and too often, failed change programs.....companies that embraced [reengineering] as the silver bullet are now looking for ways to re-build the organization's torn fabric [Davenport, (1996)].

Also in 1998 it was reported that only around 30% of BPR projects were regarded as a success [Galliers, (1998)]. BPR was not reaching its potential and there are various reasons for its limited success. Some explanations of such high rates of failure for BPR projects have been discussed in BPR literature. For example, employees' resistance to change as they consider BPR as threats to their jobs. In addition, BPR approaches lack detailed guidance and support for the actual implementation of reengineering. Many publications describe the situation before and after BPR but do not discuss the path to reach the final situation. Some experts explain that one reaction to this failure was to retain faith in IT as a dominant support and just adapt business activities to IT.

Finally, just as companies allow themselves to decline and get locked into old assumptions and habits, so do individuals and entire societies. And like companies, it all too often takes a major crisis to shatter old

assumptions and begin anew. Being a relatively new topic, research into BPR failures has only just begun. Table 1, summarises the research that has been identified.

Table 2. Reasons for BPR failure

Source & (Background)	Failure Rate	Reasons
Andrews and Stalick (1994) (Management Consultants)	66% (p28)	Culture: „failure to anticipate the power of biases and assumptions” (p. 28). Also opposites of success criteria: focus, methodology, time, participation, leadership (p. 16 – 18)
Bashein <i>et al.</i> (1994) (unknown)	-	“Reengineering is a high risk, high reward endeavour”
Belmonte and Murray (1993) (quoting unknown change management consultants)	80%	Change Management failure
Best and Forman (1992) (unknown)	-	IT: “fragmented, inflexible application software infrastructures”
Greene (1993) (Academic)	> 50%	Led by IT people; Scale: “new civilization, with a new culture, new values, and new ways of working;... change at that fundamental level will have deep repercussions.” (p. 47)
Hammer and Champy (1993) (Management Consultants)	50-70%	19 reasons: Focus 8; people 5 (incl. values and beliefs); Management / methodology 4; Other 2
Johansson <i>et al.</i> (1993)	-	Lack of: Leadership, Developing teamwork, Managing the transition, Individuals “linked by common values and highly motivated” (Chap. 8 and p. 202).
Liddle, L. acting director of US Patent and Trademark Office Business Reengineering Team (in Taylor, 1994) (User)	-	“But, it is so big and affects so many areas, virtually no aspect of the organization is untouched. ... People feel threatened ... reengineering is really, really hard,”
Martin (ed.) (1994) (Management Consultants) (Survey of IT Executives)	10% (+28% don't know) (p. 17)	None given, but concern expressed over ability of organisation to transform (e.g. “new roles, responsibility, and technology”, p20)
Moad (1993) (unknown)	often	“faltering support from upper management sponsors”
Stoddard and Jarvenpaa (in Anon, 1994) (Harvard academics) (35 case studies)	often	Lack of: “managers must be united ... willing to invest considerable corporate resources”; And “[In] Europe belief in social rights [and] residual nationalism” (p. 82)
Willcocks and Smith (1994) (Academics ex Mgt. Consultant) - (4 case studies)	-	Failure to manage the politics and power. - Also BPR is “multi-disciplinary, cross functional ambitious complex implementation issues” (p. 25)

There is a wide discrepancy in the failure rate, from as low as 10% to as high as 80%, though many are in excess of half. Whilst the key reasons appear to be the scale of the changes and the inadequate change management, quite often the people aspects are mentioned, including culture (or its attributes). Of the two academic studies, Willcocks & Smith’s study interestingly highlights the political and power dimension. This was also mentioned by a number of other academic papers and books on organisational change [Pfeffer (1993, p. 201 – 206), Schein (1985, p. 66, 72 – 74), Andrews and Stalick (1994, p. 7)] although more in the context of power being a key dimension as opposed to being a culture type.

Following the publication of the fundamental concepts of BPR by Hammer (1990) and Davenport and Short (1990), many organizations have reported dramatic benefits gained from the successful implementation of BPR. Companies like Ford Motor Co., CIGNA, and Wal-Mart are all recognized as having successfully implemented BPR.

However, despite the significant growth of the BPR concept, not all organizations embarking on BPR projects achieve their intended result. Hammer and Champy (1993) estimate that as many as 70 percent do not achieve the dramatic results they desire. Having BPR repeatedly at the top of the list of management issues in annual surveys of critical information systems shows executives' failure to either implement properly or acquire the benefits of BPR. These results make the issue of BPR implementation very important. BPR has great potential for increasing productivity through reduced process time and cost, improved quality, and greater customer satisfaction, but it often requires a fundamental organizational change. As a result, the implementation process is complex, and needs to be checked against several success/failure factors to ensure successful implementation, as well as to avoid implementation pitfalls.

There are both soft and hard factors that cause success and failure of BPR efforts. The factors listed below are based on various articles and empirical research on BPR implementation. These dimensions are:

- change management;
- management competency and support;
- organizational structure;
- project planning and management;
- IT infrastructure.

Factors relating to change management systems and culture

Factors relating to change management systems and culture are important to the success of BPR initiatives. Change management, which involves all human- and social-related changes needed by management to facilitate the acceptance of newly designed processes and structures into working practice and to deal effectively with resistance, is considered by many researchers to be a crucial component of any BPR effort.

Effective communication is considered a major key to successful BPR-related change efforts. Communication is needed throughout the change process at all levels and for all audiences, even with those not involved directly in the reengineering project. Effective communication between stakeholders inside and outside the organization is necessary to market a BPR program and to ensure patience and understanding of the structural and cultural changes needed as well as the organization's competitive position. Communication should be open, honest, and clear, especially when discussing sensitive issues related to change such as personnel reductions.

As BPR results in decisions being pushed down to lower levels, empowerment of both individuals and teams becomes a critical factor for successful BPR efforts. Since it establishes a culture in which staff at all levels feel more responsible and accountable and it promotes self-management and a collaborative teamwork culture. Empowerment means that staff is given the chance to participate in redesign processes. When empowered, employees are able set their goals and monitor their own performance as well as identify and solve problems that affect their work thereby supporting the BPR efforts.

In reengineering, there is the human involvement element in which all people must be openly and actively involved and should be consulted at all stages of the process and its leaders. This includes line managers, process owners and those involved in IS and human resources. The idea of experimentation is an essential part of a successfully reengineered organization and, therefore, people involved or affected by BPR must be prepared to endure errors and mistakes while reengineering is taking place.

Factors for Management Competency

Sound management processes ensure that BPR efforts will be implemented in the most effective manner. The most noticeable managerial practices that directly influence the success of BPR implementation are top management support and commitment, championship and sponsorship, and effective management of risks. Commitment and leadership in the upper echelons of management are often cited as the most important factors of a successful BPR project. Leadership has to be effective and creative in thinking and understanding [Hammer and Champy, (1993)] in order to provide a clear vision of the future. This vision must be clearly communicated to a wide range of employees who then become involved and motivated rather than directly guided.

Commitment to and support for the change must constantly be reinforced from senior management throughout a BPR project. Sufficient authority and knowledge, and proper communication with all parts in the change process, are important in dealing with organizational resistance during BPR implementation [Hammer and Champy, (1993)].

Barriers such as political, economic, and organizational risks are all associated with BPR-related change. And champions of the change play a major role in overcoming these barriers and increasing the chance of successful BPR implementation. The champions must be able to persuade top management of the need to change and to continually push the change efforts throughout the organization.

BPR implementation involves radical change to several systems in the organization. Risks associated with acceptance of changes in the organizational structure, deploying emerging technologies with little familiarity, large investment in new resources needed for the new processes, loss of personnel, and loss of earnings [Towers, (1994); Clemons, (1995)] are some examples of the many risks that an organization may take when implementing BPR. Therefore, continuous risk assessment is needed throughout the implementation process to

deal with any risk at its initial stage and to ensure the success of the reengineering efforts. Anticipating and planning for risk handling is important for dealing effectively with any risk when it first occurs.

Factors relating to Organizational Structure

As BPR creates new processes that define jobs and responsibilities across the existing organizational functions [Davenport and Short, (1990)], there is a clear need to create a new organizational structure which determines how BPR teams are going to look, how human resources are integrated, and how the new jobs and responsibilities are going to be formulated. An adequate job integration of organizational human resources infrastructure is important to a BPR project's success. When individuals within a process perform a series of tasks efficiently, product quality, processing time, and cost are all going to improve. However, the move to integrate human resources necessitates a careful consideration of all related organizational changes. Effective BPR cross-functional teams are a critical component of successful BPR implementation.

Team members should be experienced in variety of techniques. Teams should be made up of people from both inside and outside the organization [Hammer and Champy, (1993)]. The determinants of an effective BPR team are as follows: competency of team members, their credibility within the organization and their creativity, team empowerment, motivation, effective team leadership, proper organization of the team, complementary skills among team members and adequate size. As BPR results in a major structural change in the form of new jobs and responsibilities, it becomes necessary for successful implementation to have formal and clear descriptions of all jobs and responsibilities that the new designed processes bring along with them.

Factors related to BPR Project Management

Successful BPR implementation is highly dependent on an effective BPR Program management, which includes strategic alignment, effective planning and project management techniques, identification of performance, adequate resources, effective use of consultants, building a process vision integrating BPR with other improvement techniques. Proper planning for the BPR project with an adequate time frame are key factors in delivering a successful BPR project on time. Effective use of project management techniques and managing people-related issues have also a crucial role in smoothing the flow of the process redesign stages. Measurement of project progress should also be maintained continually throughout a BPR project.

Factors related to IT infrastructure

Building an effective IT infrastructure is a vital factor in successful BPR implementation. An adequate understanding of technologies for redesigning business processes is necessary for proper selection of IT platforms. Effective overall system architecture, flexible IT infrastructure and proper installation of IT components all contribute to building an effective IT infrastructure for business processes. The IT infrastructure and BPR are interdependent in the sense that deciding the information requirements for the new business processes determines the IT infrastructure. In addition, recognition of IT capabilities provides alternatives for BPR. Building a responsive IT infrastructure is highly dependent on an appropriate determination of business process information needs. This, in turn, is determined by the types of activities within a business process, and the sequencing and reliance on other organizational processes.

An effective IT infrastructure follows a top-down approach, beginning with business strategy and IS strategy and passing through designs of data, systems and computer architecture. Linkages between the IT infrastructure components are important for ensuring integrity and consistency among the IT infrastructure components. IT standards also have a major role in reconciling various infrastructure components to provide shared IT services that are of a certain degree of effectiveness to support business process applications. The IT infrastructure shared services and the human IT infrastructure components, in terms of their responsibilities and their expertise, are both vital to the process of the IT infrastructure composition.

6. Selecting an IT Application

One main objective of BPR is to use IT to support radical change. Some authors view IT as the central implementation vehicle of BPR. However BPR has not really worked as its proponents expected. Davenport and Short (1990) attribute this problem to a lack of understanding of the deeper issues of IT. They claim that IT has traditionally been used to increase the speed of work but not to transform it and BPR is about using IT to do things differently. Therefore, IT plays an important role in BPR. Properly implementing IT can improve the competitive position of organizations. But inappropriately implementing IT may create barriers to responding to the rapidly changing business environment. Further, simply picking IT packages cannot achieve successful BPR if it is simply used to speed up the process rather than reengineer it. As Davenport (1993) contends: ... information and IT are rarely sufficient to bring about the process change; most process innovations are enabled by a combination of IT, information and organizational/human resource changes.

IT can continuously reflect and reinforce bureaucratic and functional structures or IT can help to create a leaner, flatter and more responsive organization. For example, IT tools that are designed for functional hierarchies are primarily designed to support incremental improvements and cannot achieve the radical change in BPR projects.

IT Applications Delivery Strategy

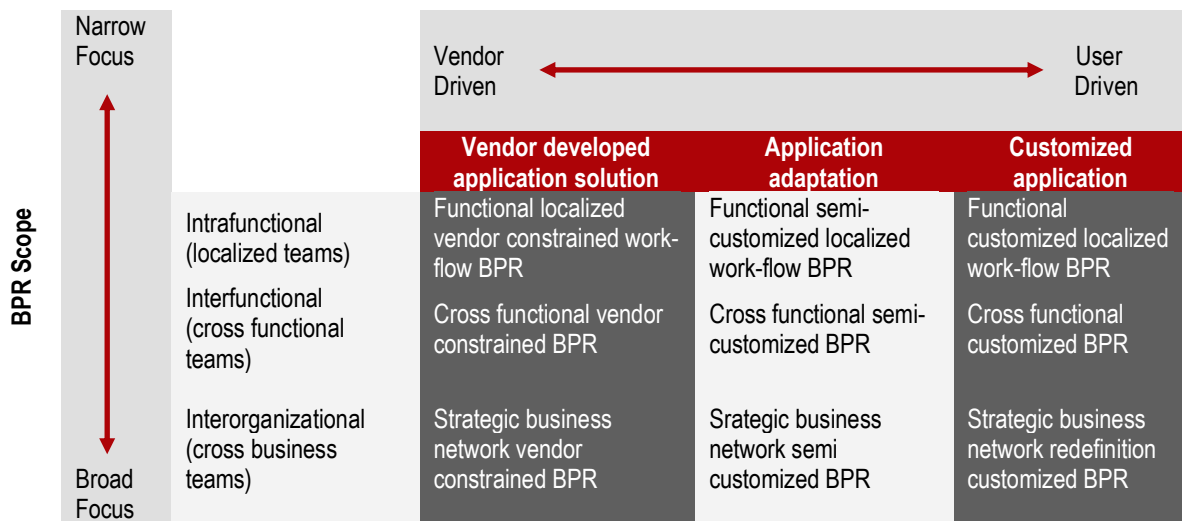


Figure 3. BPR Strategies [Light, (2000)]

While information systems provide fast processing and response, they often fail to provide the flexibility for human communication, which can lead to serious consequences. This means IT may sometimes have a negative impact by merely automating the existing processes. However, it could also have a positive impact if it is deployed correctly in conjunction with the organization’s goals. IT is the enabler to reengineer processes and is an important driving force for business transformation.

7. Relationship between IS and Organizations

There are many techniques for systems analysis and modeling, operations research, information systems (IS), and human resource management to name a few. However, system development techniques play an important role in BPR that helps make sense of the current systems. In addition, analyzing the potential benefits of the redesigned systems can help identify those information systems that will function as the greatest supporter for the radically redesigned processes. Information systems are widely used in business and identify those systems inserted into organizations to support data processing and the decision making process. In general, information systems are regarded as a kind of structure, which reflects the activities of the organization, and software system is a part of it. From this viewpoint, information systems represent abstractions of social systems. The following figure represents the relationship between the world and a software system, with the software system becoming an abstraction of the world. The following figure links the world and software.

For BPR, it is likely that providing IT to support a process may change the process itself, which leads to additional degrees of support. Therefore, if IT is accepted in organizations then a change to the organizational environment will be necessary. This suggests that the process of reengineering is dynamic and will inevitably lead to further iterations in which the reengineered processes need to be reevaluated and redesigned. The conclusion is that business reengineering and software development cannot be independent of each other. The redesign of business processes will decide the requirements of a software system, whereas the introduction of software systems will inevitably affect the way the business is currently running. The development of software systems and the process of BPR are considered interdependent. The evolution of software systems should be based on two facts: first, the organizational software should be dynamic, and second, the outcome of the software system operation is somewhat unpredictable. That is, a software system cannot move from steady state to steady state. It must constantly evolve to meet new goals, and to facilitate the development of organizational processes.

It is obvious that the introduction of software systems will change people’s perceptions as well as their behavior and, when such systems are implemented in a networked structure, this has far-reaching impact on the behavior of organizations.

People’s perceptions of organizations and the relationships between IT and organizations may be different depending on which model is used. The three dimensions of an organization include machines, organisms and processes. Each represents three waves of organization theory. The first wave, to perceive an organization as a machine, suggests that IT can be seen as a controllable resource, which is not part of the organization and is used to achieve specific objectives. The introduction of IT does not affect the organizational structure but does affect

the relationship between management and workers. The second wave, regards IT as more integrated and less controllable. IT is an element of an organization that has the potential to be an unpredictable resource.

Typically, the workers have more ownership of the technology than management. The third wave perceives an organization as a process and IT as a behavioral phenomenon.

Conventional system development methods consider an organization as a machine, whose behavior is merely determined by the behavior of individuals within the organization. Systems development tends to concentrate only on the physical parts of IT because it is hard to cope with the abstract things such as the perception and the interaction of human beings. Unfortunately, these methods are not great for the analysis of BPR because they only reflect the situations before and after the implementation of the systems, but do not emphasize the change of people's behavior once affected by IT.

There is also a similar problem appearing in BPR, because it is common that many BPR methodologies try to reduce the dynamic levels of business processes to predictable management techniques. Methodologies focusing on static definitions of data, role and processes to reflect organizational structures tend to remain less flexible for long periods.

However these static methodologies cannot define dynamic processes because people operate in dynamic manner and are prone to error causing a need for flexible systems. From a systems viewpoint, an organization has more meaning as a whole than just as a sum of its parts. The characteristics of an organization cannot identify the components of an organization. Today the greatest resource in organizations is the skill and knowledge of people. Individual knowledge and technology does not only belong to the people, but is also a part of the organization. Therefore, the behavior of organizations can be regarded as a pattern of interactions between people. After the introduction of software systems into organizations, the behavior can be understood as a pattern of interactions between people, between people and software systems, and between the software applications. The systems approach analyzes the impact upon organizations.

For this, the systems approach can be used to analyze the impact of IT upon organizations, because the nature of IT can only be assessed in terms of its total impact. An organization is a creation of the perceptions of the people involved within it. Any change in the organization will have an impact on people's perception of the organization. When analyzing business processes, we find that people interact with each other within the process and are also influenced by that process. How people will react in organizations depends on how they perceive a particular action, and their perception is important in the process of interaction. Today IT plays an important role in organizations because people use their systems to interact with others and the environment. Therefore any changes in IT may cause changes in organizational structure. Harrington (1991) suggests that systems methodology is a successful way to analyze the impact of IT organizations because "it not only reflects the way people tend to interact, and therefore capturing the essence of how people organize, it also shows the changes that occur as a whole rather than just a part of the organization."

8. BPR and Information Technology

There is a relationship between BPR and information technology (IT). Hammer (1990) considers it to be the key implementation of BPR. He says the use of IT is to challenge the assumptions inherent in the work processes that have existed since before the advent of modern computer and communications technology. He argues that at the heart of reengineering is the idea of discontinuous thinking. Discontinuous thinking is a way to recognize and break away from the outdated rules and fundamental assumptions that underlie operations. Usually, these rules are based on assumptions about technology, people, and organizational goals that no longer exist. Hammer (1990) suggests the following principles of reengineering:

- a. Organize around outcomes, not tasks;
- b. Have those who use the output of the process perform the process;
- c. interleave information processing work into the real work that produces the information;
- d. Treat geographically dispersed resources as though they were centralized;
- e. Link parallel activities instead of integrating their results;
- f. Put the decision point where the work is performed, and build control into the process;
- g. Capture information once and at the source.

Davenport and Short (1990) argue that BPR requires taking a broader view of both IT and business activity, and of the relationships between them. IT should be viewed as more than an automating or mechanizing force but rather as a way to fundamentally reshape the way business is done. Many researchers and practitioners have increasingly considered factors related to IT infrastructure as a vital component of successful BPR efforts. Effective alignment of IT infrastructure and BPR strategy, building an effective IT infrastructure, adequate IT infrastructure investment decision, adequate measurement of IT infrastructure effectiveness, proper IS integration, effective reengineering of legacy IS, increasing IT function competency, and effective use of software tools are a few of the most important factors that contribute to the success of BPR projects. This alignment of IT infrastructure and BPR strategy are needed to ensure the success of the BPR initiative.

IT can best enhance an organization's position by supporting a business-thrust strategy [McDonald, (1993)]. The business strategy should be clear and detailed. Top management should act as a strategy formulator who provides commitment for the whole process of redesign, while the IS manager should be responsible for designing and implementing the IS strategy. The strategy describes the role of IT in leveraging changes to business processes and infrastructures. IT strategic alignment is approached through the process of integration between business strategy and IT strategy, as well as between IT infrastructure and organizational infrastructure. The degree of alignment between the BPR strategy and the IT infrastructure strategy is indicated by including the identification of information resource needs in the BPR strategy, deriving the IT infrastructure strategy from the business strategy, examining the IT infrastructure strategy against the BPR strategy, the active involvement of management in the process of IT infrastructure planning and IT managers in business planning, and by the degree of synchronization in formulating the two strategies. The following figure shows the multidimensional nature of BPR.

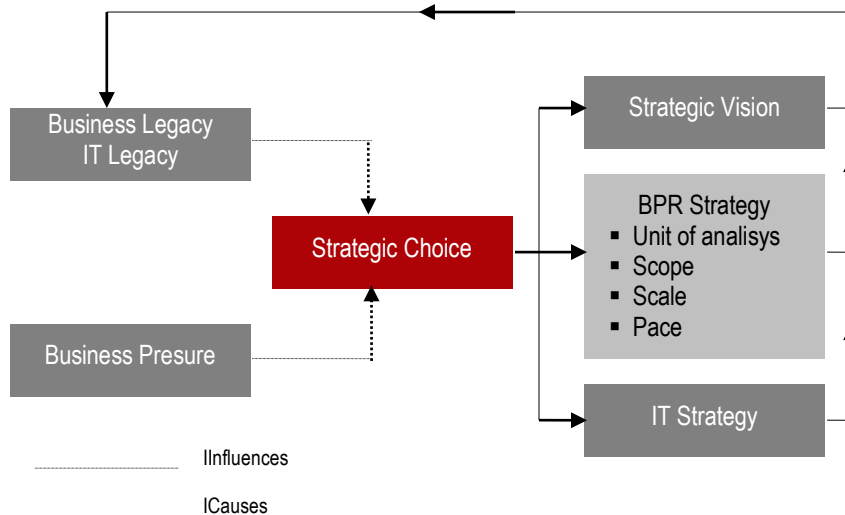


Figure 4. Multidimensional View of BPR [Light, (2000)]

Business activities should be viewed as more than a collection of individual or even functional tasks. They should be viewed as a way to achieve maximum effectiveness. IT and BPR have recursive relationships. IT capabilities should support business processes and business processes should be implemented in terms of the capabilities IT can provide. Davenport and Short (1990) refer to this broadened, recursive view of IT and BPR as the new industrial engineering. Business processes represent a powerful tool for reducing the costs of coordination [Davenport and Short, (1990)].

The way related functions participate in a process can be differentiated along two dimensions: degree of mediation and degree of collaboration. They define the Degree of Mediation of the process as the extent of sequential flow of input and output among participating functions. They define the Degree of Collaboration of the process as the extent of information exchange and mutual adjustment among functions when participating in the same process. In this framework, information technology is critical in reducing the Degree of Mediation and enhancing the Degree of Collaboration. Also, innovative uses of IT would inevitably lead many firms to develop new structures, enabling them to coordinate their activities in ways that were not possible before. Such structures may raise the organization's capabilities and responsiveness, leading to potential strategic advantages.

Although, BPR has its roots in IT management, it is primarily a business initiative that has broad consequences in terms of satisfying the needs of customers and the firm's other constituents [Davenport and Stoddard, (1994)]. The IS group may need to play a behind-the-scenes advocacy role, convincing senior management of the power offered by IT and process redesign. It would also need to incorporate the skills of process measurement, analysis, and redesign.

Davenport and Short (1990) prescribe a five-step approach to BPR:

Develop the Business Vision and Process Objectives: BPR is driven by a business vision, which implies specific business objectives such as Cost Reduction, Time Reduction or Output Quality improvement.

Identify the Processes to be Redesigned: Most firms use an approach, which focuses on the most important processes, or those that conflict most with the business vision. A fewer number of firms use the exhaustive approach that attempts to identify all the processes within an organization and then prioritize them in order of redesign urgency.

Understand and Measure the Existing Processes: Important to avoid the repetition of old mistakes and for providing a baseline for future improvements.

Identify IT Levers: Awareness of IT capabilities can and should influence process design.

Design and Build a Prototype of the New Process: The actual design should not be viewed as the end of the BPR process. In contrast, it should be viewed as a prototype, with successive iterations. The metaphor of prototype aligns the BPR approach with quick delivery of results, and the involvement and satisfaction of customers.

According to Malhotra (1998), 70% of the BPR projects fail. He states the biggest obstacles that reengineering faces are:

- Lack of sustained management commitment and leadership;
- Unrealistic scope and expectations;
- Resistance to change.

Based on the BPR consultants' interviews, Bashein et al. (1994) outline the positive preconditions for BPR success as: Senior Management Commitment and Sponsorship; Realistic Expectations; Empowered and Collaborative Workers; Strategic Context of Growth and Expansion; Shared Vision; Sound Management Practices; Appropriate People Participating Full-Time and Sufficient Budget. They also identify negative preconditions related to BPR as: The Wrong Sponsor; A "Do It to Me" Attitude; Cost-Cutting Focus; and Narrow Technical Focus. The negative preconditions relating to the Organization include: Unsound Financial Condition; Too Many Projects Under Way; Fear and Lack of Optimism; and, Animosity Toward and By IS and HR Specialists. To turn around negative conditions, organizations should: Do Something Smaller First (pilot project); Conduct Personal Transformation (change of mindset); and Get IS and HR Involved.

King (1994) views the primary reason for BPR failure as overemphasis on the tactical aspects and the strategic dimensions being compromised. He notes that most failures of reengineering are attributable to the process being viewed and applied at a tactical, rather than strategic, levels. He discusses that there are important strategic dimensions to BPR, notably, Developing and Prioritizing Objectives; Defining the Process Structure and Assumptions; Identifying Trade-Offs Between Processes; Identifying New Product and Market Opportunities; Coordinating the Reengineering Effort; and, Developing a Human Resources Strategy. He concludes that the ultimate success of BPR depends on the people who do it and on how well they can be motivated to be creative and to apply their detailed knowledge to the redesign of business processes [Davenport and Stoddard, (1994), Markus *et al.* (1994)].

Over the last few years, the reengineering concept has evolved from a "radical change" to account for the contextual realism [Caron *et al.* (1994), Earl, (1994)], and to reconcile with more incremental process change methods such as **Total Quality Management (TQM)**, towards a broader, yet more comprehensive process management concept [Davenport, (1995)].

Kettinger and Grover (1995) outline some propositions to guide future questions into the phenomenon of BPR. Their propositions center around the concepts of knowledge management, employee empowerment, adoption of new IT's, and a shared vision. Earl et al. (1995) have proposed a "process alignment model" that consists of four emphases: process, strategy, IS, and change management and control and used it to develop more BPR strategies. Malhotra (1998) has developed the key emphasis on these issues based primarily on an integrated view of recent literature from organization theory, organization control, strategy, and IS. King (1994) believes that although the current interest in BPR may end, process reengineering, in some form or another would endure.

9. The Future: BPR and ERP Systems

According to Light (2000), organizations are continuing to implement business process change projects and one of the most important factors of the BPR concept throughout the nineteen nineties has been the wide scale adoption of **Enterprise Resource Planning (ERP)** systems. It is important to examine the link between these two areas. ERP systems are process oriented and highly integrated standard software systems, which are used to automate core corporate activities such as, finance, logistics and human resources.

The ERP applications market has grown enormously over the past several years. Interestingly, Light (2000) mentions that the key reasons for the adoption of ERP systems are closely tied to those for the evolution of BPR – the need to deal with legacy systems in a complex and dynamic business environment. Companies are now looking to improve the management of global operations and employ innovative supply chain based competitive strategies such as the formation of new types of industrial structures.

However, many existing systems have become so difficult and costly to maintain, inflexible and misaligned with a global business strategy that organizations have taken a clean slate approach towards their IT and have implemented ERP systems. Managers of ERP projects have suggested to Light (2000) that ERP is the new BPR. The reason for this is because a key aspect of any ERP project is the need for most organizations to undertake some form of BPR exercise. ERP systems are process oriented and, due to their highly interconnected nature, require organizations that implement these types of system to adopt a process-oriented philosophy.

Therefore, if an organization has not undergone an organization wide reengineering exercise, they will have to do so. Even if there are elements of a process orientation within an organization, it is likely that a certain level of reengineering will occur. This can have a considerable impact on competitive advantage.

10. Conclusions

Dramatic changes in the business environment throughout the nineteen eighties forced organizations to examine outdated modes of work and develop new focused strategies based on new business models. Many business management concepts emerged but BPR has probably been the most influential. BPR emerged as a concept geared towards a clean slate, radical approach. However, the original ideas did not take into account the situations in organizations where factors such as the evolution of the ways of work, organizational cultures and IT infrastructures had become significantly linked with organizations. A variety of methodologies, tools and techniques for BPR projects have developed out of implementation failures. As a result, the concept of BPR has survived and has been broadened to become more commonly associated with multidimensional process change efforts. Reengineering is not just a matter of fundamental and radical improvements in performance, but is also an approach to analyzing and transforming the nature of businesses and industries.

Yet despite the popularity of re-engineering, the indications are that the failure rate for those seeking to redesign their business processes is high. This is perhaps to be expected, given the significant improvement in performance demanded by such programmes and the relative newness of the concept. A reason for failure may be associated with the poor state of some organisations beginning such a programme in the first instance. A further reason is perhaps due to the tremendous change which is inevitably required to migrate from a traditional functional-based organisation towards one with a process orientation.

Reengineering is a huge task. In order to reengineer a system with a successful outcome, tools are very important, since they assist the reengineers to handle the usually vast amount of data in a large legacy system. Tools will help the reengineering process by solving or assisting in solving different problems, and maybe most importantly, to save time.

11. Acknowledgment

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