

# KNOWLEDGE BASED ECONOMY IN ROMANIA

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*ABSTRACT: It is well-known that in the present the competitive advantage of an economy it is not based only on products or services, natural resources or geographic particularities. The competitive advantage it is obtained today through innovation and the extensive utilization of knowledges. For this reason the present paper presents the results of an evaluation of the Romanian economy from the perspective of the knowledge based economy. The conclusion of the evaluation is that the Romanian economy it is still under the effect of the industrial and agricultural era which promotes products and services which are not very competitive on the international and even on the national market and because of this it is necessary the stimulation of the development of the knowledge based industries and the elimination of the gaps between Romania and the other European countries.*

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## **Defining the knowledge based economy**

We can observe in the present the appearance of a new economy. It is an economy based on knowledge and ideas, in which the key factor of prosperity and employment is the superior knowledge capitalization. The new economy represents more than, you may think at the first glance, the creation of high technology. It assumes in the first hand the massive and efficient utilization of the new accomplishments. It represents “ the fundamental changing from the economy based primordially on the physical resources to the economy based primordially on knowledges” (A. B. Jones, Knowledge Capitalism-Business, Work and Learning in the New Economy, Oxford University Press,Oxford, 1999). The wealth and power in the XXI century will devolve primordially from the intangible intellectual resources, from the knowledge capital. Thus, this transition to the economy based on knowledges represents a comprehensive and profound process which generates major changes in the components of the economic activities.

Knowledge, and the ability to create, access and use it effectively, has long been a tool of innovation, competition and economic success, and a key driver of economic and social development more broadly. Yet several dramatic changes in recent years have fundamentally increased the importance of knowledge, and the competitive edge that it gives to those who harness it quickly and effectively. The ability to *process and transmit* information, globally and instantaneously, has increased exponentially per unit of cost in recent years due to the combined effect of advances in computing (microprocessor) speed, and competition, innovation and lower costs in global communications networks. As the technical impediments (distance, geography, cost) to accessing and using the best knowledge about a given process, skill, or market decrease, that knowledge becomes increasingly the key to competitiveness, locally and globally. At the same time, these efficiencies in information and knowledge flows make possible, and necessary, a closer link between research/development and downstream innovation, an increased rate of innovation, and shorter product life cycles in many major sectors of the economy. Even in the more traditional agricultural and manufacturing sectors of the economy, knowledge (about crop varieties, about new

markets, about innovative production processes) is more easily and rapidly accessible on a global basis, and thus its competitive value is increased.

Today the term of „knowledge society/ economy” it is utilized in the whole world. This term it is an abbreviation of the term knowledge-based society/ economy. If we will search on the internet „knowledge society/ economy” we will find thousands of references. Recently, the review DEUTSCHLAND dedicated a special number for the „knowledge society. Nico Stehr remarks “Social order which is under the horizon it is based on knowledge [...]. The volume of knowledges which we can use it has doubled at every five years. If we will wonder which is the effect of the actual transition from the industrial society to o knowledge society upon the employees and companies, upon the politics and democracy, shortly upon our organizational principles regarding the way of living, than it is justified to talk about the way we will live in the knowledge society”

The specialists’ opinions regarding the definition of the knowledge based economy or new economy are different from one to another. For example Daniela Archibugi and Bengt Aké Lundvall in “The Globalizing Learning Economy” (Oxford University Press, Oxford, 2001, p.21-23) approach the new economy from the perspective of the information society and internationalization and define the new economy as “a economy more dominated by the global influences and by the speed, often in real time, of the communications and information, no matter what the distance.

Ovidiu Nicolescu in synthesizing the definitions from the specialized literature, considers that “ the knowledge based economy is characterized by the transformation of the knowledges in base material, capital, products, production factors essentials for the economy and through economic processes in which the generation, selling, acquisition, learning, stocking, developing, splitting and protection of the knowledges became predominant and decisive for the profit obtaining and for the assurance of the economic sustainability on the long term” ,

In the last decades it takes place an expansion of the “new economy” term, as a new type of approach in relation with the economic science. A part of the economists, from which Kenneth Arrow, Nobel prize laureate and one of the first initiators of the modern neo-classic model and Brian Arthur from the Santa Fe Institute, consider the new economies are more dynamic adaptive systems rather closed systems of equilibrium, so it was believed a lot of time. The difference in the equilibrium approaches in the classic and new economy it is suggestively presented by Ilya Prigogine “the classic economy it is based on stability and equilibrium. Today it is observed the existence of the instability, fluctuations and evolutionist tendencies which are present at the all levels. We are facing with a more complex and structured universe than we can ever imagine. The end of this century is associated with the birth of a new science, a science which makes from the intelligence and human creativity an expression of a fundamental tendency in the universe. New perspectives are opened for the interdisciplinary researches...”

A number of international organizations and institutions were and are interested by the concept of knowledge based economy and by the tendencies manifested within the framework of this new type of economy. Thus in the paper “Knowledge based economy”, OECD considers that „the knowledge based economy represents the type of economy based directly on the knowledge and information production, distribution and utilization”. In the same time the knowledges are recognized as a “driver of productivity and economic growth, leading to a new focus on the role of information, technology and learning in economic performance. Identifying “best practices” for the knowledge-based economy is a focal point of OECD work in the field of science, technology and industry. This paper presents trends in the knowledge-based economy, the role of the science system and the development of knowledge-based indicators and statistics.

Expanding the OECD definition of the knowledge-based economy, the executive committee of APEC considers that “the production, distribution and the fructification of the knowledges is the main driver of economic growth, wealth, creation and employment at all industries levels” (APEC 2000). Conform to this definition, knowledge based economy it is not based only on few high

technologies industries for the economic growth and wealth creation. They consider that all economic sectors can be knowledge intensive. So, the executive committee of APEC considers that “all the knowledges required by the knowledge based economy are more wider than technological knowledges, an for instance include cultural, social and managerial knowledges”

In 2002 European Commission published the paper “.Towards a knowledge-based Europe- The European Union and the information society”. Starting from the EU goal- “to become the most competitive knowledge based society in the world by 2010” they establish the action plans for the period till 2010. Eu considers that „The EU.s success in achieving this goal will help determine the quality of life of its citizens, the working conditions of its workers and the overall competitiveness of its industries and services””

World Bank and OEDC had cooperated and cooperate in their activities to create knowledge based economies, being helped in their effort also by the transition countries. In the opinion of Carl Dahlman, manager of the programme knowledge for development from the World Bank Institute:” to benefit from the knowledge revolution are necessary clear strategies which can satisfy the 4 pylons of knowledge economy:

- An institutional and economic framework which promotes the knowledges efficient utilization
- An educated population for the creation and utilization of the knowledge
- A dynamic information infrastructure
- An efficient innovation system within the organizations and research centers which can satisfy the people new desires

Thomas Stewart considers that knowledge based economy has in view, because it is an economy, the money, in the context of knowledges acquisition, production and selling. In his opinion (Leading Edge: a New Way to Think about Employees, in Forum Magazin, 13.04.1998 )” knowledge based economy the fundamentals, which are the essence of this new type of economy, are:

- The knowledges become the content of acquisition, production and selling processes
- The knowledge assets, intellectual capital components, had become more important than financial assets or technical-materials assets
- Knowledges and intellectual capital fructification, the obtaining of prosperity within the market economy requires a new terminology, new managerial methods and techniques, new technologies and not in the end new strategies. In other words, knowledge based economy, „as a new type of economy requires a new type of management- knowledge based management and a new type of organization – knowledge based organization.

Stewart underlines the fact that in knowledge based economy remains essential the economic factor, reflected in the situation in the fore-ground of the economic performances. What it is changed it is the fundament of economic performances achieving, these being achieved through the superior fructification of the existing knowledges. The knowledges are approached following their economic finality, the generation of added value, regardless of their nature, sophistication and modernity degree of the contained information. Coming in the completion of this idea, the legendary Lack Welch, the ex president of General Electric stated “A good idea it is not resumed at a idea from biotechnology. A good idea is to take care of a process which requires 6 days and to reduce it to one day. We obtain mostly productivity increases of 6-7% with such ideas. Each person can have a such contribution”

In the paper Building a Knowledge-based Economy and Society, Jo Bryson realizes a review of the forces which shapes the future of the economy and of the knowledge based economy and identifies its main characteristics. The author considers that The world is witnessing a phenomenon, the effect of which is similar to, the industrial revolution and the invention of the printing press combining at the speed of sound. Information, transformed into shared knowledge and intellectual capital, is changing the face of work, education and every other aspect of life. Its effect is felt in changing business relationships and global markets, leading to a new form of

competition, co-operating with the competition; and in profound transformations of industry structures and international cartels. This phenomenon is both the cause and effect of the knowledge based economy and society.

Peter Drucker considers that in the future the success factors it will be others. „The traditional production factors- land, work and capital- had not disappeared. They had become secondary factors. The knowledge becomes the only relevant resource today. The new economy reclaims a rethinking of the production factors theory. The knowledge becomes the essential component of the contemporaneous economic and social development system. The innovations dissemination and the high technologies convergence will play a key role in the acceleration of the knowledge importance in the context of the globalization process. The knowledge in comparison with work, land and capital it is an asset which is appreciated according as it is utilized. As much as are utilized, as much the knowledges become more efficient and productive.

The study “Finland as a Knowledge Economy- Elements of Success and Lessons Learned”, edited by Carl J. Dahlman, Jorma Routti, Pekka Ylä-Anttila and realized in cooperation with the Finnish Ministry for Foreign Affairs, Ministry of Trade and Industry, Finpro—Finnish National Agency for Corporate Internationalization, ETLA—The Research Institute of the Finnish Economy and the World Bank Institute presents the way in which it can be built a knowledge based economy in a small and periphery country. Although Finland has many characteristics that cannot easily be replicated by other countries, much of its experience in designing knowledge-based economic and social strategies is highly relevant. A key lesson is the importance of flexibility in responding to change, and the critical role of a responsive education system. Finland’s experience also highlights the importance of developing a vision and a process for consensus-building. Finland can be an example to follow of turning a crisis into opportunity.

The Romanian Academy had paid and pays a special attention to knowledge society. This interest was concretized in the project „Societatea informațională - Societatea cunoașterii” (Information society- Knowledge Society) from 2001. The scope of the project was “The vision developing for a Romanian model for SI-SC and formulation of the solutions, priorities and recommended action ways for the “leap” type of development of economy, education, science and for the population formation in a view to facilitate the Romania’s evolution to the SI-SC in 2001-2010.

## **Knowledge based economy in Romania**

In the analysis of the knowledge based economy in Romania I have started from 4 major dimensions:

- Research development innovation dimension
- Information and communication technology dimension
- Human capital dimension
- Economic context dimension (macroeconomics evolutions)

Each dimension is characterized by a number of statistical indicators. Thus research development innovation dimension is characterized by the following indicators: indicators focalized on the research development innovation expenses, indicators focalized on the human resources involved in research development innovation processes, indicators focalized on the institutions which realize research development innovation activities, indicators focalized on the results of the research development innovation activities. Information and communication technology dimension is characterized by the following indicators: indicators focalized on the information and communication technology sector, indicators focalized on the internet sector, indicators focalized on the e-commerce and e-government, indicators focalized on the mobile and landline telephony, indicators focalized on the transmission of the cable audio-visual programs. Finally, the human capital dimension is characterized by the following indicators: indicators focalized on the

quantitative aspects of the human resources and indicators focalized on the qualitative aspects of the human resources.

The conclusions of the analysis based on the fourth dimensions are presented in the following lines.

In the field of research and development we can mention the following weak points: research supply insufficient stimulation, application and utilization of the author rights, weak functioning of the financing mechanism (the research activities in Romania are characterized by the lack of financing)

In the human capital domain, the identified weak points are: the gap between the quality of the human resources active in the field of science and information technology and the absorption capacity of the labor market, the superior education is in the present orientated on the economic and legal domains, long-life learning is very weak represented, massive emigration of the work force, the poor qualification of the important segments of the population in the field of information and communication technology.

Information and communication technology represents the catalytic element of the knowledge based economy because the new tendencies in the information and communication technology field accelerate the transition process to the knowledge based economy, the mobile applications are wide utilized, www becomes a primary source of information, the web services are an important transactions platform, the knowledge becomes a public good and its transmission becomes smaller. In the field of information and communication technology Romania is confronted with a important digital gap in comparison with other EU countries. In this field several weak points have been identified: reduced number of internet users who use the internet for e-commerce and e-government, reduced number of companies which are active in the e-commerce field, reduced rate of internet penetration, reduced expenses with information and communication technology, software industry is based in principal on sub- contraction.

The only dimension in which Romania has a good position is the economic context position because Romania has a high rate of economic growth (the highest in EU), the unemployment rate is not very high, the inflation has normal rates, the foreign investments rate is quite high and the rate of development of the information and communication technology sector is very high. But, on the other hand, Romania's gross domestic product it is very low in comparison with the average EU gross domestic product, the proportion of experts in GDP is very low (because the imports are more bigger than the exports).

## **Conclusions**

Romanian economy is still under the effect of industrial and agricultural era which produces products and services which hardly are competitive on the international and even on national markets. For this reason it is necessary to stimulate the industries based on knowledge and to eliminate the gaps between Romania and other European countries through innovation, utilization of the information's and communications technologies and the development of the educational system. If Romania will not stimulate the knowledge based industries, its position in EU will be characterized through high costs and uncompetitive products.

The stimulation of the knowledge based economy in Romania is the main mean for our country to participate on global markets. At the economic level, we have to assure a dynamic equilibrium between international competition based on costs (reduced salaries, products and services with reduced value added) and knowledge (high qualification of the human resources, research and innovation, products and services with high value added).

The construction of the knowledge based economy in Romania it is still at the beginning, the national politics and programs are in the present specific of the concept of the information society. Till now the strategic actions have been focalized on the development of the

communications infrastructures. The main progress of Romania through the knowledge based economy is the decision made by the Romanian authorities to build a knowledge based economy in Romania.

### References:

1. Ad Astra- *Cartea albă a cercetării din România*, disponibil online la adresa [www.adastra.ro](http://www.adastra.ro)
2. A. B. Jones- *Knowledge Capitalism-Business, Work and Learning in the New Economy*, Oxford University Press, Oxford, 1999
3. ANRCI, *Studiu cantitativ privind piața serviciilor de acces la internet*, Noiembrie 2006, disponibil online la adresa [www.anrci.ro](http://www.anrci.ro)
4. European Commission, Information Society and Media Directorate-General- *Broadband access in the EU: situation at 1 July 2007*, Octombrie 2007, disponibil online la adresa [www.ec.europa.eu/eurostat/](http://www.ec.europa.eu/eurostat/)
5. Eurostat, Romania- *i2010 Annual report 2007*, disponibil online la adresa [www.ec.europa.eu/eurostat/](http://www.ec.europa.eu/eurostat/)
6. Felea. M.- *Dezvoltarea comerțului electronic în condițiile globalizării*, Amfiteatru economic nr.17/ 2005
7. Guvernul României Ministerul Educației Și Cercetării, Autoritatea Națională Pentru Cercetare Științifică- *Politicile guvernamentale pentru cercetare-dezvoltare și inovare în România, Raport 2006*, disponibil online la adresa <http://www.mct.ro/>
8. Leydesdorff L., Dolfsma W., Gerben Van der Panne- *Measuring the knowledge base of an economy in terms of triple-helix relations among technology, organization, and territory*, Research Policy Volume 35, Issue 2, March 2006, Pages 181-199 , disponibil on line la [www.sciencedirect.com](http://www.sciencedirect.com)
9. Popescu I, Puică R., Constantinescu M.- *Societatea europeană a cunoașterii- perspective economice, sociale și juridice*, Editura Academiei Române, București, 2006
10. Rai L. P., Lal K.- *Indicators of the information revolution*, Technology in Society Volume 22, Issue 2, April 2000, Pages 221-235 disponibil on line la [www.sciencedirect.com](http://www.sciencedirect.com)
11. State O., Costache I.- *Comerț electronic și e-business în România*, Amfiteatru economic nr. 21/ 2007
12. Strategia națională pentru promovarea noii economii și implementarea Societății Informaționale (aprobată prin HG 1440/2002).
13. Strategia TIC- Orizont 2025
14. Voinea L.– coordonator, Pauna B., Marinescu C.- *Performanța în contextul Agendei Lisabona: Experiențe de succes, design instituțional*, Institutul European din România – Studii de impact III, Studiul nr. 4, disponibil online la [www.ien.ro](http://www.ien.ro)
15. Dragomirescu, H.-*Studiu tematic elaborat în cadrul proiectului prioritar “Societatea informațională – societatea cunoașterii” al Academiei Române* - București, 10 noiembrie 2001, disponibil online la [www.racai.ro](http://www.racai.ro)
16. Nicolescu, O.- *Economia, firma și managementul bazat pe cunoștințe*, Editura Economica, București, 2006