EKONOMSKI FAKULTET PODGORICA

Youth ASECU

3rd INTERNATIONAL SUMMER SCHOOL OF ASECU YOUTH

KNOWLEDGE ECONOMY – IMPACT ON SUSTAINABLE DEVELOPMENT OF THE COUNTRIES FROM EAST AND SOUTH EAST EUROPE

Organized by
Faculty of Economics, University of Montenegro
in cooperation with **ASECU YOUTH**
July 15-20, **2013**
Kotor, **Montenegro**

IMPRESSUM

FOR PUBLISHER: ***Milivoje Radović***, Dean of the Faculty of Economics, Montenegro

PUBLISHER: **Faculty of Economics**, University of Montenegro in Cooperation with **ASECU YOUTH**

PRINTING: Fotografika, Podgorica

CIRCULATION: 150

July 2013

CIP – Каталогизација у публикацији
Национална библиотека Црне Горе, Цетиње

ISBN 978-86-80133-64-5
COBISS.CG-ID 22697488

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ANALYSIS OF POTENTIAL OF THE KNOWLEDGE ECONOMY FORMATION IN UKRAINE: INTERNATIONAL EXPERIENCE AND NATIONAL PRIORITIES

Statement of the problem

In modern society the ability to generate, use and spread new knowledge is the basis of national competitiveness and the basic precondition for accelerated socio-economic growth. The strategy of the development of information-knowledge society is today the priority of socio-economic policy of the developed countries, allowing them to take full advantage of opportunities that are opening before them through the transition to a new type of post-industrial society – information society. A special type of economy – the knowledge based economy – serves as an economic foundation for this society. Current problems of economic development are connected with intellectualization of labor, prioritizing the processes of production of new knowledge that can provide steady development and socio-economic progress for the Ukrainian society.

One of the key factors in accelerating the pace of technological development is the availability of knowledge that is one of the most important conditions for the participation of a state in the global competition. In times of crisis, knowledge is the resource that becomes important not only as the level of intellectual abilities, but also as an economic resource, which becomes a means of innovation creation and implementation.

Keywords: *knowledge economy, potential, Knowledge Economy Index.*

ANALYSIS OF RECENT RESEARCHES AND PUBLICATIONS

In recent years the term „knowledge economy" can be found in many international and national scientific works; as a rule, it is used to define such type of economy in which knowledge plays crucial role, and the production of knowledge is a key factor of economic growth. In the context of economic theory, special attention deserve such representatives of neoclassical economics as G. Becker, E. Denison, P. Drucker, L. Edvinsson, F. Machlup, T.Sakaiya, T.Stewart and many others.

Significant contribution to the study of the knowledge economy problems made Russian scientists: O. Gaponenko, V. Gluhov, V.Inozemtsev, V.Makarov, B. Milner and others.

The problems connected with the development of the knowledge economy in Ukraine were researched in the works of Yu. Bazhal, A. Halchynskyi , V. Heyts, G. Zadorozhnyi, L. Musina, L. Fedulova and others.

Despite a large number of scientific works and substantial achievements in the knowledge economy, there still remain questions regarding the use of the experience of other countries that consider themselves to be the ones with knowledge economy and identifying by Ukraine the priorities of innovation development.

T**he goal of the article** is to identify the key factors of knowledge economy formation using the examples of several countries that consider themselves the countries with the economy in which most of the gross domestic product is provided by production, processing, storage and spreading of information and knowledge.

THE MAIN MATERIAL

The problem of improving the competitiveness of the Ukrainian economy is extremely important, taking into account the fact that in its quantitative and qualitative macroeconomic parameters and business environment it remains considerably behind not only the developed countries but also the former Soviet Union republics. Under globalization, Ukraine remains poorly connected to global flows of capital, innovation and information. Not perfect institutional regime and lack of economic incentives that give rise to innovation generate weak ability for absorption of new technologies, innovative ideas and attributes of civil society. In other words, while the leading countries of the world are transiting to the innovative society, Ukraine remains the country of raw materials with extremely high inertia not only in generation, but also in spreading knowledge, turning it into innovation and using foreign innovative decisions [4].

The term „knowledge based economy" or intellectual economy reflects the recognition of the fact that scientific knowledge and unique skills of its carriers are the main source and key factor in the development of material and non-material production ensuring in such a way sustainable economic development.

The concept of the knowledge economy was formed in the process of analytical generalization of economic development patterns of the world community over the last 15-20 years. This period is characterized by unprecedented growth of influence of science and new technologies on socio-economic development of all countries. The information revolution technologies got the most prominent place in these processes that led to perception of post-industrial society as information one; biotechnology, medicine, technologies of creation and spreading of new materials, transportation, astronautics, communication, financial intermediation, etc. were no less successful. So, the tendency of the formation of modern society is clearly defined: the transition from the raw-materials and industrial economy to the knowledge economy based on intellectual resources and science intensive and information technologies [10].

There appears a situation where services play a major role in economic and social life, creating in the developed countries up to 70% of workplaces. It becomes possible due to the formed and developed national innovation system which includes four components of innovation potential (the potential of learning, the potential of knowledge generation, the potential of knowledge spreading and the prospective demand for knowledge). The potential of learning refers to the ability to acquire new knowledge and adapt imported technologies.

The research potential is important not only for generation of new knowledge, but also as a mechanism for knowledge introduction and learning. Spreading of knowledge is the main mechanism by which economic benefits from investments into research design-development work and from the increasing potential of knowledge learning is realized. The demand for innovation is the key economic mechanism that initiates processes of wealth generation and learning and spreading of knowledge.

The important condition is also the provision of sufficiently high volume of financial resources for innovation support from the country's budget and incomes of entrepreneurs, well-organized domestic market and favorable conditions for exporters [9].

Such an approach creates overall positive climate for innovation development and introduction, which is also assisted by a wide network of innovation support institutions among small and medium enterprises at both national and regional levels.

Industries that produce not goods but services are getting bigger. These were the latter that have become the main object of sale in the post-industrial society, and information and knowledge are becoming main production resource.Radical changes connected with replacement of labor by knowledge lie in the fact that in the context of globalization, when knowledge is involved into practical processing of resources, it is knowledge, not labor, that is the source of value [8].

The essence of the knowledge economy concept is the use of knowledge to produce globally competitive new products and technologies.Development of the knowledge economy serves as the essential condition for the formation of information society. The knowledge economy is the economy that creates, spreads and uses knowledge to ensure its growth and competitiveness. In such economy, knowledge enriches all branches, all sectors and all participants of the economic process. It not only uses knowledge in various forms, but creates it in the form of scientific and high-tech products, highly qualified services and education [2].

The main factor of economic development in most European countries is the intellectual component – human knowledge that eventually causes growth of labor productivity and acts as a determinant of economic growth under the current circumstances. If intelligence is becoming the main resource and the driving force in the knowledge economy, then the innovation system is the medium that provides transformation of the intellectual activity results into profitable production activity and further development. From the effective organization of innovation activity depends how efficiently scientific and education institutions work in order to improve national competitiveness, economic growth and structure [6]. Synthesis of the international organizations approaches, proposed by global and European practice of views on the components of the knowledge economy allows to determine the five key elements:

- Economic incentives and institutional regime that encourage effective use of national and global knowledge in all sectors of the economy;
- Quality and uninterrupted education for the entire population in order to create highly qualified society of mobile and creative individuals;
- Effective innovation system that combines business, scientific and other research centers and educational institutions into a single complex;
- Dynamic information infrastructure that provides information and communication services to economic agents, government institutions and all segments of the population;
- State as the initiator and coordinator of the knowledge economy formation and development.

The high competitive status of countries is formed, first of all, by knowledge (educational) and research factors and technological innovations. Education development and personnel training, human resources, labor markets and financial system significantly affect the state of the system; the level of importance of investment into scientific potential is increasing.

According to the Organization for Economic Cooperation and Development (OECD), at the present stage of social development, investment in knowledge increases much faster than investment in fixed assets. In order to study the processes that occur in the process of knowledge economy development, OECD proposed the following indicators:

- Development of high-tech sector of economy, innovation activity;
- The size of investments in the knowledge sector: the costs of higher education, scientific research, experimental development, as well as software development;
- Development and production of information and communication equipment, software and services;
- Growth of employment in science and high technology fields;

- Volume and structure of venture capital;
- Participation of private capital in financing research and development activities and experimental development;
- The structure of costs for research and development work and experimental development according to the stages of research (basic and applied ones);
- International cooperation in science and innovation;
- Increased cooperation between the business community, research organizations and universities;
- Interstate exchange of results of inventions;
- Mobility of researchers, highly qualified experts and students;
- Increased amount of financial transactions;
- Distribution of information and communication technologies;
- The share of high-tech manufacturing and high-tech services and more.

In its turn, the World Bank proposed to assess the level of readiness of countries for transition to the knowledge economy through Knowledge Economy Index (KEI). The calculation of this index is based on the definition of arithmetic mean of four aggregate indices:

- economic incentive and institutional regime (EIIR)
- innovation system (IS)
- education and human capital (EHC)
- information and communication technology (ICT).

The normalized rate for each country is calculated as the ratio of the number of countries the performance of which is worse than that of the given country, to the number of all the countries concerned. The calculated index ranges from 0 to 10. Information on the Knowledge Economy Index, calculated according to the data of 145 countries, is posted and perpetually updated on the official website of the World Bank since 1995 [1]. Table 1 presents the summary data of these indices for Ukraine compared to other countries.

Table 1 – Raiting of the countries according to the Knowledge Economy Index (2012) [1]

Raiting	Country	KEI	EIIR	IS	EHC	ICT
1	Sweden	9,43	9,58	9,74	8,92	9,49
2	Finland	9,33	9,65	9,66	8,77	9,22
3	Denmark	9,16	9,63	9,49	8,63	8,88
4	Netherlands	9,11	8,79	9,46	8,75	9,45
5	Norway	9,11	9,47	9,01	9,43	8,53
6	New Zealand	8,97	9,09	8,66	9,81	8,30
7	Canada	8,92	9,52	9,32	8,61	8,23
8	Germany	8,90	9,10	9,11	8,20	9,17
9	Australia	8,88	8,56	8,92	9,71	8,32
10	Switzerland	8,87	9,54	9,86	6,90	9,20
14	Great Britain	8,76	9,20	9,12	7,27	9,45
22	Japan	8,28	7,55	9,08	8,43	8,07
55	Russia	5,78	2,23	6,93	6,79	7,16
56	***Ukraine***	***5,73***	***3,95***	***5,76***	***8,26***	***4,96***
59	Belarus	5,59	2,50	5,70	7,37	6,79
110	India	3,06	3,57	4,50	2,26	1,90

Analysis of the data indicates that Ukraine is close to the developed countries only in terms of education and human capital. What draws attention is the very low level of institutional regime. This is connected, according to the expert opinion, with poor quality of such institutions as protection of property rights, including intellectual ones, independence of the judicial system, public confidence in politicians, transparency of government decisions, the burden of government regulation, effectiveness of corporate governance, organized crime [7].

It should be mentioned that our state inherited from the former Soviet Union powerful production and scientific and technical base, significant reserves of natural resources, skilled workforce. This allowed Ukraine to remain for a long time the world leader in mechanical engineering, metallurgy, chemical industry, production of military equipment, aircraft building and space technology. But over the years, factors that provided competitive advantages are gradually running out. There is a need for support of strategic sectors of the economy by the state, because it is the state that plays the leading role in the innovative development of the national economy.

Unfortunately, the innovation component in the Ukraine's economy is reduced each year, and today it is less than 6%, while in the EU the component makes up more than 60%, and in the U.S. it accounts for 78%. In the developed countries, over 90% of the GDP increase is provided by the introduction of new technologies. Ukraine's share in the high-tech products market, which is estimated at 2.5-3 trillion US dollars, is approximately 0.05-0.1% [5].

According to the State Statistics Committee, the number of organizations that performed scientific research and development increased in 2012 compared to 2000 by 23.3%. The number of researchers over the same period fell by 32.1%, despite the fact that the number of Doctors of Philosophy in economics increased by 44.1% and candidates of science, by 44.6%.

Every year, innovation activity of enterprises is reduced. In 2000, the share of enterprises engaged in innovation was 18.0% and in 2012 it made up 17.4%. The share of technological innovation funded by the state at the end of 2012 was only 1.9%. The own funds of enterprises are still the main source of technological innovation funding. [3]

The main problems that hinder Ukraine's transition to innovative development model are as follows:

1. At the national level, priority strategies of science and technology development are not defined. As a result, the state budget aimed at scientific research is used inefficiently as the research is performed at the discretion of the customer and the executor.
2. The national industry is not ready for introduction of modern technology because of the need of substantial re-equipping.
3. Issues of the core funding of basic research are not regulated by law. The priority is to fund current needs of the basic research field, rather than introduction of results of scientific and technological activities into production and economic circulation. In order to maintain the number of scientists, the priority is given to labor expenditures; the expenditures for the purchase of necessary materials, raw materials and reagents are almost not planned, making it impossible to conduct research.
4. Destroyed system of interaction between science, education and production; insufficient funding of academic and industrial science; outdated physical infrastructure.
5. Imperfect commercialization mechanism of the developments funded by the state. The results of research are not brought to the economic entities, are not implemented at the national level, that causes loss of economic benefit derived from new scientific knowledge and developments.
6. State structures, in fact, do not coordinate or monitor the results of research; there are no real customers for scientific developments.
7. The low efficiency of state administration and regulation of the economy, the existence of substantial administrative barriers prevent the full development of the institutional components of

the innovation system.

8. Fragmentary national innovation infrastructure: operation of several scientific and technological parks and business incubators.

Taking into consideration the European integration vector of Ukraine, there have been investigated the level of readiness of Ukraine's transition to the knowledge economy and the directions of economic development with the account of the experience of individual countries. The results are presented in Table 2.

Table 2 – Key factors of the successful knowledge economy formation in individual countries

Country	**Japan**
Model	Industrial - Agricultural
Characteristics	Practical application of innovations
Key factors of the successful knowledge economy establishment	Development of advanced technologies and their implementation in quality and affordable goods; Common standards and compatibility of products; Toyota production system; Economical production, production with zero inventory; The ability for constant changes to meet the needs of the market; No reject, „right thinking", lifelong learning
Country	**India**
Model	Agricultural - Industrial
Characteristics	Industrialization + Building of knowledge economy
Key factors of the successful knowledge economy establishment	Main product: services Focusing on internal development Development of the IT industry due to the absence of language barrier; cheap labor; Low barrier of entry to the IT market; Reduction of import tariffs; reduced restrictions for the activities of foreign companies; Even development of knowledge and industry; Implementation of knowledge and production processes; Creation of relaxed and creative atmosphere; Distribution of productive forces; Infrastructure development through investment in industrial sector
Country	**Finland**
Model	Industrial - Agricultural
Characteristics	Manufacturing + High level of rapid acquiring of new technologies
Key factors of the successful knowledge economy establishment	Investments in the development of long-term projects; Deregulation of cash flows; as a result, increase of investment; Creation of private investment funds; Clear response to changes of market conditions; Systems approach; creation of a number of innovative structures; Forecasting of the needs of the knowledge economy; Continuous upgrading of technologies as the basis for long-term growth; Focusing on securing competitiveness in priority areas; High level of social consciousness; openness to new ideas and technologies; Promotion of domestic competition; Motivation as the result of competent social policy (education); Clear, interconnected work of state institutions; Monitoring of innovation market; Orientation of the education system on production needs; Ability to use complex crisis situations as possible ways for economic growth; Continuous improvement of technologies

Country	**United Kingdom**
Model	Mixed
Characteristics	Prevalence of the services market. Main productive resources: information, knowledge
Key factors of the successful knowledge economy establishment	Selling of strategies: provision of consulting, banking, educational, arts and design services; Development of financial centers: commodity and financial exchanges; Ability to learn and adopt the best from others; Minimal government intervention, favorable investment climate; English language and education as strategic goods; Strong university system; Unusual approach to problem solving: dealing with distressed companies, not their isolation; State responsibility, transparency of operations and stable clearly regulated legislation framework; Simplifying of tax system; Refusal from inefficient financing (refusal to support disappearing industries) and investments in new long-range industries; Creation of local business enterprises as the result of splitting of inefficient industry giants; state support of these enterprises; Creation of favorable investment environment for foreign companies; Requirement from businesses of accurate reporting about business income and financial state.

Taking into account Ukraine's gap in components of competitiveness and given the European integration vector of Ukraine's development – namely, the transition to the knowledge economy – the main areas of reform in the knowledge based economy development must be: creation of economic incentives and institutional environment; preparation of the society of highly qualified, mobile and creative individuals; development of dynamic information infrastructure; formation of effective innovation system and favorable business environment that stimulate innovation and entrepreneurship; creation of new cultural environment that is most appropriate for the economic development policy based on knowledge. Expansion and activization of innovative scientific and educational activities, support of new ideas, knowledge and technology, readiness for the creation and implementation of multifunctional innovations into scientific and educational practice depend directly on practical realization of state innovation policy, as the state is not only able, but obliged to take effective measures to ensure the conditions for the development of the national knowledge economy.

In order to create modern national innovation system it is necessary:

1. To identify legislatively the strategies and to concentrate innovation and investment policy on them.
2. To create the competitive research and development sector; to create conditions for its expanded reproduction.
3. To introduce the system of economic incentives for the integrated modernization of the economy based on technological innovation.
4. To improve normative legal acts that regulate the use of scientific and technical information, including copyright protection of unpublished research results (scientific and technical reports, documents, etc.).
5. To develop legislative conditions of use of intellectual property and scientific research results obtained for the state funds, that accelerates the commercialization of research results.
6. To provide necessary conditions for the development of venture businesses.
7. To develop measures of tax incentives, antimonopoly, customs and financial control and technical regulations of innovative investment activities.
8. To improve accounting system of intellectual property objects and statistical reporting in invest-

ment and innovation.
9. To develop the assessment system of the innovation and investment effectiveness.
10. To provide and implement the control functions of the state in legitimacy and effectiveness of funds allocated to innovation and investment.

CONCLUSION

The concept of the knowledge economy has become today the main theoretical basis of the economic growth policy. It reveals the new role and the new place of human intellect in society. With accelerated growth of technology, availability of knowledge becomes essential for the country's participation in global competition.New technologies can have positive impact on the economies of countries, regardless of their level of development, as evidenced by the experience of the UK, Finland, Japan and India, which with the help of effective education systems have successfully found their information technology segments that allow them to be competitive on the global market. From this perspective, Ukraine's success in achieving competitiveness depends on its ability to adapt its potential in creation, use and spreading of knowledge to the needs of the global economy as quickly as possible.

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