Results of economy growth possibilities study with respect to innovation and knowledge development are given in the article. The paradigm of economy growth is analyzed. The main focus in this article is on environment and factors affect knowledge economy formation and its functioning mechanisms. Large part of factors is determined by post – communist transformation and euro – integration processes. We can state that knowledge economy development is mostly influenced by negative results of transformation processes.

Essential problems influencing knowledge economy development in Lithuania are given. Mentioned factors have positive or negative impact, the power and duration of impact is different. Many of factors have synergetic influence. Problem is that among mentioned factors, that influence knowledge economy development in Lithuania factors having negative impact dominate, their impact is long - term and strong.

_Growth of economics, knowledge economy, enterprise, agriculture policy._

**Introduction**

In order to describe adequately situation of Lithuania economics and to give hypothetic forecasts regarding the capabilities of the country to develop on the basis of the knowledge and innovations, it is important to define exactly conjuncture of modern economics and to name key factors of economics growth.

_Scientific problem:_ growth of economics is exceptional problem to analysis of which the particular attention is paid; however we lack the works systematically analyzing capabilities of Lithuania economics growth on the basis of innovations and knowledge development.

_Research goal:_ to analyze knowledge economy expression theoretical interpretation, to reveal factors of economy growth in the knowledge economy, in order to determine factors influencing economy growth and knowledge economy development in various periods and their interaction in Lithuania.

_Research methods:_ monographic, comparative analysis, logic analysis and synthesis, graphical illustration, modeling.

_Research results:_ Study of economy growth possibilities study with respect to innovation and knowledge development is given.

**The paradigm of economy growth on basis of innovations and knowledge development**

While trying to understand moving forces of economical reality changes in XXI century, the analytical conceptions “globalization”, “knowledge economics” and “information society” become very important (Castells, 1996; Dordick, 1993, Dunning, 1997). Information technologies determined establishment of new socie-
ty (information society), new culture (virtual reality) and new economics (knowledge economics) (Dunning, 2007–Anmdersen, 1999; Taylor, 2002).

There are many theories of economics growth. In the latter decade researchers directed their attention to endogenic factors of technological changes, determining the growth many researchers treat human capital (more precisely, development of its qualitative parameters) and knowledge as the most important factors of the macroeconomic growth. These factors superseded such variables as investments, hoarding, growth of population, fiscal and monetary policy, political stability etc.

Carried out researches have showed that rates of economical growth are directly proportional to the growth of human capital (Malhotra, 2003; Daugelienė, 2002); (UN ..., 2006).

“New knowledge“ as social goods and “human capital” as the most important resource, needed for receiving of new knowledge and their transformation to innovations, products and services, in order to meet growing demand, form new dominating paradigm of economic growth in XXI century (European Commission, 2004; 2005; Malhotra, 2003; Castells, 1996).

Is knowledge economy established in Lithuania?

Commission of European Union, the World Bank and other institutions when evaluating knowledge development in individual countries use generalized index of knowledge based economics (IKBE). This index aggregates volumes and status of human resources, innovative policy, information technologies and innovative business. Evaluating status of knowledge economics in Lithuania according to the IKBE index it is little behind the EU average (7.74 and 7.17 respectively); this index is higher in USA 8.5, Japan – 8.26, and the highest in Sweden – 9.17.

Although IKBE index is not significantly lower in EU countries (including Lithuania), in comparison with USA, the situation significantly differs in comparison of these countries according the indicators of economical effectiveness and GNP growth – average hour work productivity in EU in the latter decade decreased: in 1990 it was 2.5 percent, and in 1996–2006 it decreased to 1.5 percent, while in USA it increased to 2.4 percent; in 15 countries of EU until the expansion in 2004 GNP per capita indicator made only 70 percent of USA ones, after the expansion GNP of 25 countries of EU makes only about 58 percent of this indicator in USA (European Commission, 2004; 2005; Eurostat, 2007). In Lithuania situation in this respect is very bad – work productivity level makes only 28.9 percent of EU level.

It is usually to treat that knowledge economics status is determined by several variables: innovations, innovative business, human resources, information technologies and its infrastructure development and social-economical context and/or state social-economical policy. The conception, that long-term economical growth mostly is determined by technological changes, innovations and human capital development, is formed. These factors in their turn depend on the investments into knowledge (e.g., education, science and research and experimental development) (OECD, 1996).
Knowledge economics development in Lithuania same as in all post-communist countries of the East and West Europe except already mentioned factors is influenced by factors which are of characteristics to this group of countries, also the factors the influence of which is not traditionally evaluated although summary impact of these factors group has critical influence for individual knowledge economics development in full and stipulating development of individual its components (innovations, innovative business, human resources, information technologies).

Although rate and scale of transition changes in all CEE countries is dramatic, and many of countries are treated as “active market” countries, they still face with transition economy phenomena reforms still are going in socio-political field (Solnyškiniene, 2006).

It is most important to state clearly due to what subjective or objective reasons such poor situation is formed and that should be changed in order to make it better? More important it is not state bad or good situation, but to clarify how provisions of such situation appearance are formed.

Disincentive policy in agriculture, which does not support enterprise

Although all knowledge economy components are equally important, very big concern is very low level of Lithuania citizens’ enterprise. Low level of actual enterprise is negative result of transformations. Changes in this field are very small.

According to data of Statistics department per thousand of Lithuania citizens in 2006 in average there were 18 companies and 25 persons performing individual activity. In European Union there are 52 companies per one thousand citizens, in USA – about 70, or fourfold more than in Lithuania. Now enterprise level in Lithuania lags from EU countries more than 3,5 times. (It is similar in other Baltic states also. Several times more it is in Czech, Hungary and Slovakia).

Study results show that people in Lithuania escape risk, due to this they chose hired work (Nacionalinės …, 2006; Solnyškinienė, 2007)

The special studies about purposefully carried out policy, focused on employment reduction and enterprise repression in agriculture should be needed (I have in mind policy, oriented on increase of number of outgoing from intensive agriculture activity, including EU agriculture and support policy). According to the Statistics department data part of the employees in the agriculture in comparison with total number of employed in Lithuania in 1990 made 27,6 percent, in 2000 – 18,7 percent, and in 2006 – 12,4 percent. During the independence period number of employed in the agriculture reduced more than twice. This indicator is still some times more than EU average. In European Union employed in agriculture, hunting, forestry and fishing in 2005 made 4,9 percent of all employed. This indicator was the highest in Greece, Poland and Austria.

Improvements in economy structure at first sight should delight but having analyzed general economy restructuring and market reforms context – optimism reduces.
Agriculture objects and land privatization determined significant quantitative and qualitative changes in agriculture field.

Now in Lithuania village about 1/3 of country citizens lives. More than 58 percent of village citizens are of employable (15–59 years old). During the reforms number of direct agriculture production workers significantly reduced. According to Lithuania agriculture consulting service data, part of economies along with farming develop alternative activities. However in 2005 such economies made only 4 percent of all respondent economies (Lietuvos žemės ..., 2007).

Fast reducing village people employment in the agriculture, the need of outgoing employment and retraining problems solving appears. In unemployed structure former agriculture workers in 2006 made about fifth part in previous years quarter of all unemployed. Villagers, which did not received suitable support and did not adapt in local labor market, migrate from the country.

Result of faulty reform policy – village become grate of poverty. In 2005 lower than defined poverty margin which made 363 Lt (about 100 Eur) per capita per month 577 thousand people lived, and this much more than in 2004. In last year in village 30 percent of people live lower than poverty margin, in large cities – 8 percent, in other cities – 18 percent. In village the large criminality is prevalent alcoholism, violence against children and women level, the biggest number of suicides. In village – if there is no job, there is no income.

It is evident that state is not able to solve these and many other problems effectively, and villagers are not able to make this by themselves.

Factors impacting knowledge economy formation and its functioning mechanisms

Many factors affect knowledge economy formation and its functioning mechanisms, large part of them is determined by post-communist transformation and euro-integration processes. Some of factors have synergic effect (Solnyškiniene, 2006). Having generalized results of scientific and practical researches on the knowledge economy development in the East and Central Europe countries, we can state that knowledge economy development is mostly influenced by negative results of transformation processes, such as, structurally and with respect of power non-competitive economy, regional disproportions, distress of reforms, level of corruption and nepotism etc. (Researchers often ignore this significant factor) (Solnyškinienė, Bartosevičienė, 2007; Melnikas, 2003; Smilga, 2003; Guogis, 2004; Maniokas, 2002).

Although all knowledge economy components are equally important, very big concern is very low level of Lithuania citizens’ enterprise. Low level of actual enterprise is negative result of transformations. Changes in this field are very small.

According to data of Statistics department per thousand of Lithuania citizens in 2006 in average there were 18 companies and 25 persons performing individual activity. In European Union there are 52 companies per one thousand citizens, in
USA – about 70, or fourfold more than in Lithuania. (It is similar in other Baltic states also. Several times more it is in Czech, Hungary and Slovakia).

Study results show that people in Lithuania escape risk, due to this they chose hired work (Solnyškinienė, 2007; Smilga, 2003; Nacionalinės …, 2006).

On the other hand, EU membership, and increased possibilities to complement country budget with money from EU structure funds, create hypothetic possibilities for business and innovations to develop much faster, for economy to grow.

However, country economical policy is not transparent. As result pool economy forms. Level of corruption and nepotism significantly decreases possibilities of EU structure funds support implementation, the EU support distribution transparency is not ensured, etc. Mentioned factors have positive or negative impact, the power and duration of impact is different. Many of factors have synergetic influence. Problem is that among mentioned factors, that influence knowledge economy development in Lithuania factors having negative impact dominate, their impact is long-term and strong.

Knowledge economy development is also influenced by external factors, such as: globalization; demographical; possibility to use support of EU funds possibility to integrate into: united European space of scientific research, Europe science foundation, Europe Investments bank, Europe investments foundation and etc. Impact of external factors is often particularly significant (e.g., EU membership allowed using of structure funds support; influence of multinational corporations increase misbalance competitive balance in market due to which situation of national small and middle enterprises declines etc.).

Work author defined groups of factors, dividing them into internal and external, which determine knowledge economics formation presumptions and form mechanisms of its functioning and give forecast how the synergetic action of these factors will influence capabilities of Lithuania economics growth on the basis of knowledge and innovations (see table).

Table. Factors influencing prerequisites of knowledge economics formation and mechanisms of its functioning

<table>
<thead>
<tr>
<th>Subsequences</th>
<th>Effect nature</th>
<th>Effect strength</th>
<th>Effect duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group of transition factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-competitive economy with respect to structure and power</td>
<td>negative</td>
<td>strong</td>
<td>long term</td>
</tr>
<tr>
<td>Regional disproportions</td>
<td>negative</td>
<td>medium</td>
<td>long term</td>
</tr>
<tr>
<td>“Special” period of changes</td>
<td>positive</td>
<td>strong</td>
<td>short term</td>
</tr>
<tr>
<td>Syndrome of “reform fatigue”</td>
<td>negative</td>
<td>medium</td>
<td>midterm</td>
</tr>
<tr>
<td>Social–economical policy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beginnings of clan economy</td>
<td>negative</td>
<td>cumulative</td>
<td>long term</td>
</tr>
<tr>
<td>Formation of peripheral economy</td>
<td>negative</td>
<td>cumulative</td>
<td>long term</td>
</tr>
<tr>
<td>Low level of institutional administrative competence</td>
<td>negative</td>
<td>medium</td>
<td>midterm</td>
</tr>
<tr>
<td>“Small state” syndrome</td>
<td>negative</td>
<td>small</td>
<td>midterm</td>
</tr>
<tr>
<td>Subsequences</td>
<td>Effect nature</td>
<td>Effect strength</td>
<td>Effect duration</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>---------------</td>
<td>-----------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Level of corruption and nepotism level</td>
<td>negative</td>
<td>cumulative</td>
<td>long term</td>
</tr>
<tr>
<td>Clarity in EU support distribution</td>
<td>negative</td>
<td>cumulative</td>
<td>long term</td>
</tr>
<tr>
<td>Qualitative changes in high education and education system</td>
<td>negative</td>
<td>cumulative</td>
<td>long term</td>
</tr>
</tbody>
</table>

**External factors**

<table>
<thead>
<tr>
<th>Subsequences</th>
<th>Impact</th>
<th>Effect Strength</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possibility to integrate into: united European space of scientific research,</td>
<td>positive</td>
<td>medium</td>
<td>long term</td>
</tr>
<tr>
<td>Europe science foundation, Europe Investments bank, Europe investments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>foundation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Possibility to use support of EU funds</td>
<td>positive</td>
<td>medium</td>
<td>midterm</td>
</tr>
<tr>
<td>Downtrend of State sovereignty</td>
<td>negative</td>
<td>weak</td>
<td>long term</td>
</tr>
<tr>
<td>Globalization</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase of TNC influence</td>
<td>constantly</td>
<td>strong</td>
<td>long term</td>
</tr>
<tr>
<td>Central and peripheral economics</td>
<td>cumulative</td>
<td>strong</td>
<td>long term</td>
</tr>
<tr>
<td>Demographical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase of population</td>
<td>negative</td>
<td>medium</td>
<td>long term</td>
</tr>
<tr>
<td>Ageing</td>
<td>constantly</td>
<td>weak</td>
<td>long term</td>
</tr>
</tbody>
</table>

When trying to define knowledge economy development level by four dimensions according to the European Commission structure model, we can say that situation in Lithuania is not good (see scheme), although changes of last years give promises (see fig.).

**Knowledge production (scientific research)**
- Non-adequate system of education under present contemporary need.
- Decreasing science potential.
- Low level of scientific research, technology development and innovations.
- Poor financing of research and development (R&D).
- Structural disbalance between applied and fundamental research.

**Knowledge propagation by teaching**
- A fair amount of teaching, qualification and retraining program modules are non-adequate to contemporary need.
- Low competence in knowledge information exchange.
- Low prestige of researcher in society.

**Propagation by information and communication technologies**
- Inappropriate or even non-existent infrastructure (databases, institutions, equipment).
- Dominance of National (non-international) nets due to language and cultural differences.
- Poor diffuse of information (communication) technologies.

**Knowledge application for technology innovations**
- Efficiency disbalance between theoretical and practical research.
- Due to structural disproportions and size of enterprises, their financial capability there are poor possibilities for business sector enterprises to develop and adapt innovations.

**Fig. Essential problems influencing knowledge economy development in Lithuania**

It is important to solve all these problems complexly. The State must participate in solving of these problems not through innovative activity support means,
but also by solving general social-economical problems (education and science, social safety etc.).

Conclusions

1. Many factors affect knowledge economy formation and its functioning mechanisms, large part of them is determined by post – communist transformation and euro – integration processes. Some of factors have synergic effect. We can state that knowledge economy development is mostly influenced by negative results of transformation processes.

2. To develop a scenario at state level for elimination or decrease of negative factors impact which influence knowledge economics state and operation mechanism.

3. By formed groups of competent experts to develop a scenario how to solve apparent problems in such fields as knowledge development and propagation, wide spread of information technologies and knowledge application for technological innovations development.

References

EKONOMIKOS AUGIMO GALIMYBĖS INOVACIJŲ IR ŽINIŲ PLĖTROS PAGRINDU: LIETUVOS PATIRTIS
Jolanta Solnyškinienė
Kauno technologijos universitetas

Santrauka

Straipsnyje išanalizuoti ekonomikos raidos ypatumai; aptartos ekonomikos augimo varomosios jėgos ir ją sąlygojantys veiksniai. Išanalizuota ekonomikos būklė Lietuvoje, išskiriand pagrindinius veiksnius, įtakojusius ekonomikos augimą ir žinių ekonomikos plėtrą skirtingais laikotarpiais. Aptarta padėtis žemės ūkio sektoriuje. Pateikta ekonomikos augimo galimybių inovacijų ir žinių plėtrą pagrindinį tyrimų studija.