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ECONOMIC SCIENCE FOR RURAL DEVELOPMENT

Proceedings of the International Scientific Conference

Resources and Education

Resources

Education and Research for the Countryside

№ 22

"ECONOMIC SCIENCE FOR RURAL DEVELOPMENT"

Proceedings of the
International Scientific Conference

RESOURCES AND EDUCATION

1. Resources
2. Education and Research for the Countryside

№ 22
Jelgava
2010

TIME SCHEDULE OF THE CONFERENCE:

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Process – April 22-23, 2010

Latvia University of Agriculture, 2010
Agricultural University of Szczecin, 2010
BA School of Business and Finance, 2010
Baltic International Academy, 2010
Daugavpils University, 2010
Fulda University of Applied Sciences, 2010
Higher School of Economics and Culture, 2010
Institute of Economics of Latvian Academy of Sciences, 2010
Institute for National Economy Research, 2010
Klaipeda University, 2010
Latvian State Institute of Agrarian Economics, 2010
Riga International School of Economics and Business Administration, 2010
Lithuanian Agricultural University, 2010
Liverpool John Moores University, 2010
Munster University of Applied Sciences, 2010
Research Institute of Biotechnology and Veterinary Medicine "Sigra", 2010
Rēzekne High School, 2010
Riga Technical University, 2010
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University of Agriculture in Krakow, 2010
University of Bonn, 2010
University of Latvia, 2010
University of Ljubljana, 2010
University of the Western Cape, 2010
Warsaw University of Life Sciences, 2010
West University of Timisoara, 2010

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Priekšvārds

Latvijas Lauksaimniecības universitātes (LLU) Ekonomikas fakultātē līdz ar ikgadējo, tradicionālo starptautisko zinātnisko konferenci „Ekonomikas zinātne lauku attīstībai" iznāk tajā prezentējamo pētījumu starptautiski recenzētie zinātniskie raksti. **Šogad konference ieiet otrajā gadu desmitā un tiek organizēta 11. reizi.** Šajā gadā konferencē piedalās zinātnieki no Eiropas un Dienvidāfrikas, kuri pārstāv ne vien ekonomikas zinātni tās apakšnozaru daudzveidībā, bet arī pētījumos ir piepulcinājuši kolēģus no sociālo un citu zinātņu nozarēm, tā apliecinot mūsdienu zinātnes starpdisciplināro un multidimensiālo attīstību. Konference ir veltīta aktuālai lauku attīstības tematikai, tādēļ ir izdoti trīs secīgi laidieni (Nr. 21., 22. un 23.). Mūsu regulāro zinātnisko rakstu pirmais laidiens iznāca 2000. gadā.

2010.gada 22. un 23.aprīļa starptautiskajā zinātniskajā konferencē piedalās un savus zinātniskos pētījumu rezultātus prezentē profesori, zinātņu doktori, asociētie profesori, docētāji, doktoranti un citi pētnieki no šādām augstskolām un zinātniski pētnieciskajām iestādēm:

- Latvijas Lauksaimniecības universitāte
- Baltijas Starptautiskā akadēmija
- Banku augstskola
- Biotehnoloģijas un veterinārmedicīnas zinātniskais institūts "Sigra"
- Daugavpils universitāte,
- Ekonomikas un Kultūras augstskola
- Fuldas Profesionālā universitāte
- Klaipēdas universitāte
- Krakovas Lauksaimniecības universitāte
- Latvijas Universitāte
- Latvijas Valsts Agrārās ekonomikas institūts
- Latvijas Zinātņu akadēmijas Ekonomikas institūts
- Lietuvas Lauksaimniecības universitāte
- Liverpūles Džona Moora Universitāte
- Ļubļanas universitāte
- Minsteres lietišķo zinātņu universitāte
- Rēzeknes Augstskola
- Rietumkeiptaunas universitāte
- Rīgas Tehniskā universitāte
- Rīgas Starptautiskā ekonomikas un biznesa administrācijas augstskola
- Szent Istav universitāte
- Ščecinas Lauksaimniecības universitāte
- Tallinas universitāte
- Tallinas tehniskā universitāte
- Timisoara Rietumu Universitāte
- Varšavas Dzīvības zinātņu universitāte

Foreword

Every year the Faculty of Economics, Latvia University of Agriculture holds the international scientific conference "Economic Science for Rural Development" and publishes internationally reviewed papers of scientific researches, which are presented at the conference. **This year the conference enters the second decade and is organised for the 11th year running.** Researchers from Europe and South Africa representing not only the science of economics in the diversity of its sub-branches have contributed to the conference this year; they have expanded their studies engaging colleagues from social and other sciences, thus confirming inter-disciplinary and multi-dimensional development of the contemporary science. The conference is dedicated to topical themes of rural development; hence the research results are published in three successive volumes (No. 21, 22 and 23). The first volume of scientific conference proceedings was published in 2000.

Professors, doctors of science, associate professors, assistant professors, PhD students, and other researchers from the following higher education and research institutions participate in the International Scientific Conference held on April 22-23, 2010 and present their results of scientific researches:

- Agricultural University of Szczecin
- BA School of Business and Finance
- Baltic International Academy
- Daugavpils University
- Fulda University of Applied Sciences
- Higher School of Economics and Culture
- Institute of Economics, Latvian Academy of Sciences
- Klaipeda University
- Latvia University of Agriculture
- Latvian State Institute of Agrarian Economics
- Lithuanian Agricultural University
- Liverpool John Moores University
- Munster University of Applied Sciences
- Research Institute of Biotechnology and Veterinary Medicine "Sigra"
- Rēzekne High School
- Riga International School of Economics and Business Administration
- Riga Technical University
- Szent Istvan University
- Tallinn University
- Tallinn University of Technology
- University of Agriculture in Krakow
- University of Latvia

Konferencei izvēlēti sekojoši aktuāli temati:
- Ražošana un sadarbība lauksaimniecības primārajā, sekundārajā sfērā
- Integrēta un ilgtspējīga attīstība
- Finanses un nodokļi
- Izglītība un zinātne laukiem;
- Resursi un ilgtspējīgs patēriņš
- Mājas ekonomika

Pirmo reizi atsevišķi pārstāvēta mājas ekonomikas un ilgtspējīga patēriņa sekcija, kuras darbības nodrošināšanā iesaistījušies pasaulē atzīti mājas ekonomikas un patēriņa ekonomikas pārstāvji ilggadīgas sadarbības partneri no Vācijas, Lielbritānijas, Igaunijas. Konferences vārds pirmo reizi izskanēja arī visā plašajā pasaulē, arī Āfrikā un Āzijā.

Starptautiskās zinātniskās konferences zinātniskuma un starptautiskiem standartiem atbilstošu zinātnisko darbu prezentēšanas nodrošināšanai veikta vispusīga iesniegto zinātnisko rakstu starptautiska un starpaugstskolu recenzēšana. Šajā nolūkā lielākā daļa zinātnisko rakstu ir angļu valodā.

Katru iesniegto zinātniskā raksta manuskriptu vērtēja (recenzēja) parasti viens autora valsts recenzents un otrs – citas valsts vai citas augstskolas recenzents. Pretrunīgu recenziju gadījumā darbs tika nodots vēl trešajam recenzentam. Recenzenti darbu autoriem bija anonīmi. Katram autoram tika nosūtīti recenzentu iebildumi vai ieteikumi. Pēc uzlabotā (galīgā) varianta un autora paskaidrojuma saņemšanas katru zinātnisko rakstu vērtēja šīs konferences zinātnisko rakstu redkolēģija.

Starptautiskās zinātniskās konferences „Ekonomikas zinātne lauku attīstībai" visi zinātniskie raksti sakārtoti trijos tematiskajos laidienos:

Nr.21. Ražošana un nodokļi:
Ražošana un sadarbība primārajā, sekundārajā sfērā
Finanses un nodokļi

Nr.22. Resursi un izglītība
Resursi
Izglītība un zinātne laukiem

Nr.23. Ilgtspēja
Integrēta un ilgtspējīga attīstība
Mājas ekonomika un ilgtspējīgs patēriņš

- University of Ljubljana
- University of the Western Cape
- Warsaw University of Life Sciences
- West University of Timisoara

The following topical themes have been chosen for the conference:
- Primary and secondary agricultural production and cooperation;
- Integrated and sustainable development;
- Finance and taxes;
- Education and research for the countryside;
- Resources and sustainable consumption;
- Home economics.

The branch of Home economics and sustainable consumption is represented for the first time in the conference thanks to the world recognised representatives and long-term cooperation partners in the sphere of home and consumption economics from Germany, the United Kingdom, and Estonia. For the first time the conference resounded on the worldwide scale, also in Africa and Asia.

The comprehensive reviewing of submitted scientific articles has been performed on international and inter-university level to ensure that only high-level scientific and methodological research results, meeting the requirements of international standards, are presented at the conference. Therefore the majority of articles are in English.

Every submitted manuscript has been reviewed by one reviewer from the author's native country or university, while the other reviewer came from another country or university. The third reviewer was chosen in the case of conflicting reviews. All reviewers were anonymous for the authors of the articles. Every author received the reviewers' objections or recommendations. After receiving the improved (final) version of the manuscript and the author's comments, the Editorial Board of the conference evaluated each article.

All the papers of the international scientific conference "Economic Science for Rural Development" are arranged into the three following thematic volumes:

No. 21 Production and Taxes:
Primary and Secondary Production and Cooperation
Finance and Taxes

Rakstu publicēšana pirms konferences sekmēs tās norisi, domu apmaiņu, rosinās diskusijas, ekonomikas zinātnieku starptautisko sadarbību. Zinātniskajos rakstos izklāstītie pētījumi un to rezultāti kļūst pieejami plašam interesentu lokam visā pasaulē.

Konferences zinātnisko rakstu kopsavilkumi angļu valodā tiek ievietoti starptautiskās datu bāzēs:

- Apvienoto Nāciju Pārtikas un lauksaimniecības organizācijas (ANO FAO) starptautiskā informācijas sistēma lauksaimniecības zinātnes un tehnoloģijā AGRIS (International Information System for the Agricultural Sciences and Technology) (www.fao.org/agris/) un speciāli akadēmiskajām augstākajām mācību iestādēm, visaptverošā zinātniskā, daudznozaru pilnu tekstu datubāzēs:
- (EBSCOHost Academic Search Complete) un
- CABI PUBLISHING datubāzēs (http://search.ebscohost.com/login.aspx?authtype=ip,uid&profile=ehost&defaultdb=lbh, kā arī
- CAB ABSTRACTS (CABA) ir bibliogrāfiskajā datubāzē http://www.cabi.org/ vai http://www.cabi.org/Default.aspx?site=170&page=1016&pid=2227

Ceram saņemt atsauksmes un priekšlikumus turpmāko zinātnisko rakstu izdevumu sagatavošanai un starptautisko zinātnisko konferenču rīkošanai.

Pateicamies visiem rakstu autoriem, recenzentiem, programmas komitejai, redkolēģijai un tehniskajam personālam.

Konferences orgkomitejas vārdā
Aija Eglīte
Latvijas Lauksaimniecības universitātes
Ekonomikas fakultātes asociētā profesore

No. 22 Resources and Education
Resources
Education and Research for the Countryside

No. 23 Sustainability
Integrated and Sustainable Development
Home Economics and Sustainable Consumption

The publishing of the Proceedings before the conference will promote exchange of opinions, discussions, and collaboration of economic scientists on the international level. The research results included into the Proceedings are available worldwide to any interested person.

The abstracts of the conference proceedings provided in English are submitted to the international databases:

- AGRIS - International Information System for the Agricultural Sciences and Technology (www.fao.org/agris/) set up by the Food and Agriculture Organisation of the United Nations (FAO UN), and especially to the databases containing full research texts set up by the academic higher education institutions:
- (EBSCOHost Academic Search Complete) and
- CABI PUBLISHING databases (http://search.ebscohost.com/login.aspx?authtype=ip,uid&profile=ehost&defaultdb=lbh as well as
- CAB ABSTRACTS (CABA), which is a bibliographical database http://www.cabi.org/ or http://www.cabi.org/Default.aspx?site=170&page=1016&pid=2227

We are open to comments and recommendations for the development of future conference proceedings and organisation of international scientific conferences.

We would like to thank all the authors, reviewers, members of the Programme Committee and the Editorial Board as well as supporting staff for their contribution organising the conference.

On behalf of the conference organisers
Aija Eglīte
Associate professor of Faculty of Economics
Latvia University of Agriculture

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"ECONOMIC SCIENCE FOR RURAL DEVELOPMENT"

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RESOURCES AND EDUCATION

1. Resources

Inter-industry Labour Flows as an Auxiliary Instrument in Researching Latvian Industrial Clusters

Anastasija Vilciņa, Dr.oec., professor,
Department of Economics, Faculty of Economics, Latvia University of Agriculture
Vera Boroņenko, Dr.oec., researcher
Institute of Social Studies, Faculty of Social Sciences, Daugavpils University

Abstract. The rapidly increasing literature on labour mobility has shown that the intensity and the patterns of worker flows have important implications not only on the labour markets, but also on the productivity growth and overall industrial renewal in general. Furthermore, employment mobility constitutes a channel for knowledge and technology diffusion between academics, companies and industries, creating clusters on the industries' level. The present research focuses, in addition to measuring the intensity of inter-industry labour mobility, on establishing the employment transition linkages (or labour flow paths) between industries. The authors use the experience of the Research Institute of the Finnish Economy (ETLA) – the quantitative measuring of the patterns of worker flows between industries as well as anonymous individual data from the Labour Force Survey of Latvian Statistics to implement the Finnish research tool in Latvia. The authors are planning to examine the directions of labour flows, i.e. from where to where the transitions are made as well as the strength of these linkages, i.e. how common it is in relative terms that a worker in an industry moves to a different industry (or to non-employment). These aspects are then reflected in the discussion of labour market shocks and industry life cycles, where the entry and exit of workers is a significant indicator of the growth and decline of industries. The method of labour flows explains partly the state and dynamics of some industrial clusters as well as the modern performance of Latvian industries in the human capital aspect. The authors' empirical analysis is based on the application of longitudinal employer-employee data that cover the whole working age population in Latvia.
Key words: industry, industrial clusters, labour flow, labour mobility.

Introduction

In researches in the science of economics, a composition and a life cycle of sectors and their industries in the national economy are usually calculated according to the value of final output. There is an extensive scientific literature in which linkages among industries are analysed by applying the input-output approach which analyses the quantities of raw materials and semi-finished products, which one industry receives from another industry and the quantities of products produced in this industry, which are transferred further to other industries as a raw material or a semi-finished product. This approach is used to study how technologies and along with them productivity effects are transferred among industries and how they are related to the economic growth (Domar E.D., 1961; Jorgenson D.W. et al., 1987; Oulton N., 2001; Daveri F., Silva O., 2004). Input-output tables were also used to identify industrial clusters when analysing competition advantages in the production process (Feser E.J., Bergman E.M., 2000; Hill E.W., Brennan J.F., 2000). The basic task of all these studies was to search for linkages, according to product flows, among industries, at the same time ignoring labour flows.

However, ignoring the process of inter-industry clusterisation, which is based on human capital, is a significant imperfection at least because the productivity potential included in labour is an important factor of the economic growth (Corrado C.A. et al., 2005). As an example, an analysis of the Nokia industry can be mentioned (Daveri F., Silva O., 2004), which reveals that the production of telecommunication equipment had no large productivity spillover effects on other industries, for instance, on the industry of IT services. One of the reasons for it was the weak input-output linkages between the Nokia industry and the rest of Finland's economy in the 1990s. However, later studies on labour flows showed there is a quite strong labour outflow from the Nokia industry through the research industry to education. Besides, it identifies interesting and significant labour inflows into the Nokia industry from the industry of telecommunication and business services through the industry of computer services. The industries related to the Nokia industry have an important role in economic growth in the future if taking into consideration the mobility of labour and its know-how among industries.

With the market economy strengthening in Latvia, the relations between employees and their workplaces gained a new socio-economic shape that differs from the traditional system in which almost all organisations and enterprises were complex hierarchic systems which existed for more than one human lifespan, and an ideal career could be made by employees moving up their professional hierarchy within one such an organisation or enterprise. However, in a modern market economy in which one of the main goals of a market entity is provision of high competitiveness, the mobility of employees

both within organisations and enterprises of one industry and among industries or even economic sectors could be usefully regarded as, first of all, a factor raising the competitiveness of labour and, secondly, a factor transferring knowledge among industries, which fosters their development and illustrates their life cycle and their structure in the national economy. The foreign studies show that the majority of employees do not change their industry of occupation for a 4-5 year period. For instance, during 2000-2004, 68.2% of labour stayed in the same industries, 17.2% moved to another industry, and 14.6% became unemployed (Maliranta M., Nikulainen T., 2008). However, if taking into account the fast restructuring of Latvia's economy, which is related both to the transition to a market economy in the 1990s and to the existing economic crisis, the following hypothesis could be set forth: the labour flows among industries in Latvia's economy are more intense than in Finland and they have their own specifics that reflect the clusterisation processes in Latvia on the level of industries. A problem is that the mobility of labour among industries in Latvia is not studied and, therefore, cluster studies lack particular arguments when constructing Latvian industrial clusters based on human capital flows.

The research aim is to develop an algorithm that would help empirically identify inter-industry linkages in Latvia according to the labour flow intensity. The following tasks have to be accomplished to achieve the aim:

1) to investigate the methodologies for determining the intensity labour flows, which are used in economic science in the world;
2) to describe the algorithm of identifying industrial clusters based on the intensity of labour flows, using anonymous individual data from the Labour Force Survey of Latvian Statistics.

The main research method is the methodology of determining the intensity labour flows, which was elaborated at the Research Institute of the Finnish Economy (ETLA) and approbated in the ETLA studies on Finland's industries.

Results and discussion

In Latvia, labour flows among industries have not been systematically researched till now. However, few research results on labour flows among industries, which are scientifically justified and empirically verified, can be found in publications by a professor Mihails Hazans. For instance, it was ascertained which sectors of the Baltic countries' economies create the largest labour flows to non-employment, i.e. the largest unemployment risks (Hazans M. et al., 2003), as well as flows of individuals due to employment, unemployment, and economic inactivity were studied by using the data base of labour surveys and applying multivariate regression (Hazans M., 2005).

In rare publications of foreign scientists the authors succeeded in finding two methodologies on determining inter-industry labour flows. The first one was developed and used by American scientists of Russian origin to analyse inter-industry labour flows in the Russian economy (Ахмедов А. et al., 2006). In their analysis, they used sectors or groups of industries of an aggregate economy: raw material industries; manufacturing industries; finances, crediting and governance; and other services. The fifth "sector", to which labour could move, was non-employment. It has to be mentioned that a high level of aggregation of industries did not allow the American scientists to obtain a detailed composition of inter-industry labour flows in the Russian labour market.

To analyse inter-industry labour flows, the American scientists used a model of vector autoregression, showing that the probabilities of inter-industry labour transition make a matrix with a size of N times N and a number of elements $P=(p_{ij})$.

The results of assessing the model of vector autoregression are summarised in Table 1. An attention has to be paid to the fact that, first of all, the matrix of inter-industry labour transition probability is diagonal, i.e. only the diagonal elements of the matrix are significant coefficients in regression analysis. It allows asserting that the "net" labour flows among the selected sectors were insignificant and the largest role was played by the inter-sector labour flows. Specifically, the "net" labour flows from the manufacturing industries to the raw material industries as well as to the industries producing other services are small because the corresponding coefficients are insignificant. However, an interesting fact is that there is a quite high probability (17.6%) that the labour moves from the industries producing other services (including transportation, communication, health care, and education) to the industries of financial intermediation. It indicates a significant labour transition from the shrinking sectors, in terms of output, to the growing sectors (Ахмедов А. et al., 2006).

A more detailed approach to researching labour flows, which allows determining also clusters that emerge on the inter-industry level on the basis of transferring human capital and knowledge, was used by scientists of the Research Institute of the Finnish Economy (ETLA) in their research practise. As empirical data, they used longitudinal data of employees and employers, which were constructed with the help of *Finland Statistics* by using various administrative registers on both individuals and enterprises, which include information about all working age individuals (aged 16-70 years) and enterprises (Maliranta M., Nikulainen T., 2008).

In the Finnish approach, individual employment was defined based on the main economic activity during the research year. In practise, it means that any individual being a hired employee for at least 6 months during the research year was regarded as an employee. Self-employed individuals were also included in the analysis. Part-time employees and other atypical cases were excluded, and limitations for the minimum and maximum average monthly wage were introduced. In this analysis, the ETLA researchers focused their attention on the time period from 2000 to 2004. The empirical data shape an N*N+1 matrix, where N is a number of

Table 1

Ratings of labour flows among sectors in Russia's economy

Economic sectors	Raw material industries	Manufacturing industries	Finances, crediting and governance	Other services
Raw material industries	0.975**	0.013	0.005	-0.003
Manufacturing industries	0.047	0.912**	0.034	-0.017
Finances, crediting and governance	-0.072	0.183	0.890**	0.176**
Other services	-0.137	0.038	0.109	0.654**

Source: Ахмедов А. et al., 2006, p. 510.
Note: ** - is significant at a statistical significance level of 0.01

Table 2

A theoretical matrix of labour flows among industries for explaining the algorithm of data analysis by the Finnish scientists

2000/2004	A	B	C	D	E	F	G	H	I	Non-employment	Total
Industry A	1	0	0	0	1	0	0	1	1	4	8
Industry B	1	0	1	1	1	0	2	1	2	5	14
Industry C	0	1	1	2	0	1	1	2	2	3	13
Industry D	0	3	1	1	3	3	5	1	2	2	21
Industry E	1	1	3	2	4	3	2	2	3	2	23
Industry F	3	0	0	2	2	4	5	3	3	1	23
Industry G	0	1	**5**	1	1	3	1	4	1	3	**20**
Industry H	0	1	1	2	2	2	1	1	4	3	17
Industry I	1	0	0	2	0	1	2	0	2	3	11
Total	9	8	**12**	16	14	17	20	17	20	26	150

Source: developed by the authors according to Maliranta M., Nikulainen T., 2008
Note: all the numerical values in the table are not real and taken only for explaining the algorithm of data analysis

industries in an economy, however, one side of the matrix is supplemented with one more labour flow path – non-employment. Every element of the matrix shows a number of individuals who, when working in a particular industry in the year 2000, moved to another particular industry or became unemployed in 2004.

Table 2 presents a theoretically possible matrix, the goal of which is to demonstratively show a data analysis algorithm that was used by the Finnish researchers. By making such a matrix according to the employment data of any national economy (for demonstrative purpose, it was assumed that the number of employees engaged in a national economy is 150) for any two years, rtp (relative transition probability) coefficients can be calculated – in this example – by dividing 5 by 20, then 5 by 12, and then the first result by the second one. Based on the results, a composition of industries according to labour flows for the national economy can be illustrated graphically. Thus, not only the size of labour flow, but also the relative size of both "exit" industry and "entry" industry, in terms of number of individuals, will be taken into consideration.

Nevertheless, when preparing the methodology of the Finnish researchers to approbate it on Latvian empirical basis, the authors offer to introduce the following innovations in it:

1) part time employees have to be also included in labour flows because, to achieve the research aim, the main idea is to show the employment industry at two different time points irrespective of how many hours per week an individual works in it;
2) transitions from non-employment to employment in a particular industry have to be also included in the matrix of inter-industry labour flows to determine how intensive is the attraction of employees by various industries.

Figure 1 presents the real results of a research conducted by the Finnish scientists on Finland's economy from 2000 to 2004, which were obtained by applying the methodology of determining the intensity of labour flows on employment data. Figure 1 reflects only the inter-industry linkages whose rtp coefficients were greater than 1, i.e. significant. The Finnish researchers started analysing the obtained result from the industry of education,

which could be a "donor" for several industries. As we can see in Figure 1, there is no significant direct labour flow from the industry of education to other industries, however, education is an important resource for the industry of research (rtp=1.33). The industry of research supplies human capital to three industries in Finland's economy: 1) energy industry (rtp=4.5); 2) chemical industry (rtp=2.5); and 3) industry of telecommunication equipment (rtp=3.2). The latter industry has a significant labour flow linkage with the industry of computer services (rtp=1.6), which, in turn, is related to the industry of postal and telecommunication services by both the exit labour flow (rtp=1.6) and the entry one (rtp=1.4). So, the labour flows illustrate the Finnish cluster of ICT in the human capital aspect. Figure 1 shows two important "bases" of this cluster: research industry and rubber/plastics industry (rtp=3.0).

At the end of the exit chain of labour flows from the industries of education and research, the cluster of machinery is located, which consists of traditional industries having inter-linkages among the industries of machinery, metals, metal products, ship and transport equipment, and, to some extent, the industry of rubber and plastics. The linkage between the above mentioned industry of rubber and plastics, and the industries of telecommunication equipment and electrical machinery is interesting. A reason for it is the fact that the industry of rubber and plastics is a subcontractor for the two above mentioned industries, i.e. it produces covers for cellular phones.

In a fundamental research on Finland's clusters performed by the ETLA scientists in the 1990s, the linkages between the forest cluster (including paper and timber production) and the machinery cluster were analysed (Hernesniemi et al., 1995). However, by using the methodology of determining the intensity of labour flows, no significant linkages between these clusters in the human capital aspect were identified, except for a fact that the paper industry is a source of labour for the machinery industry (rtp=1.2).

The third industrial cluster, which was identified by researching labour flows in Finland's economy, is the energy cluster consisting of two industries: the industry of energy sources and

the industry of energy production having inter-linkages (rtp=9.4 for energy production and rtp=1.4 for energy sources). The industry of energy production has significant exit labour flows to the industry of paper production (rtp=1.9) and to the industry of machinery (rtp=1.7).

And finally, the labour flows create, at least in a perfunctory manner, a fourth cluster – the construction cluster that has direct and indirect linkages with the industries of mining, minerals, chemicals, and machinery rental.

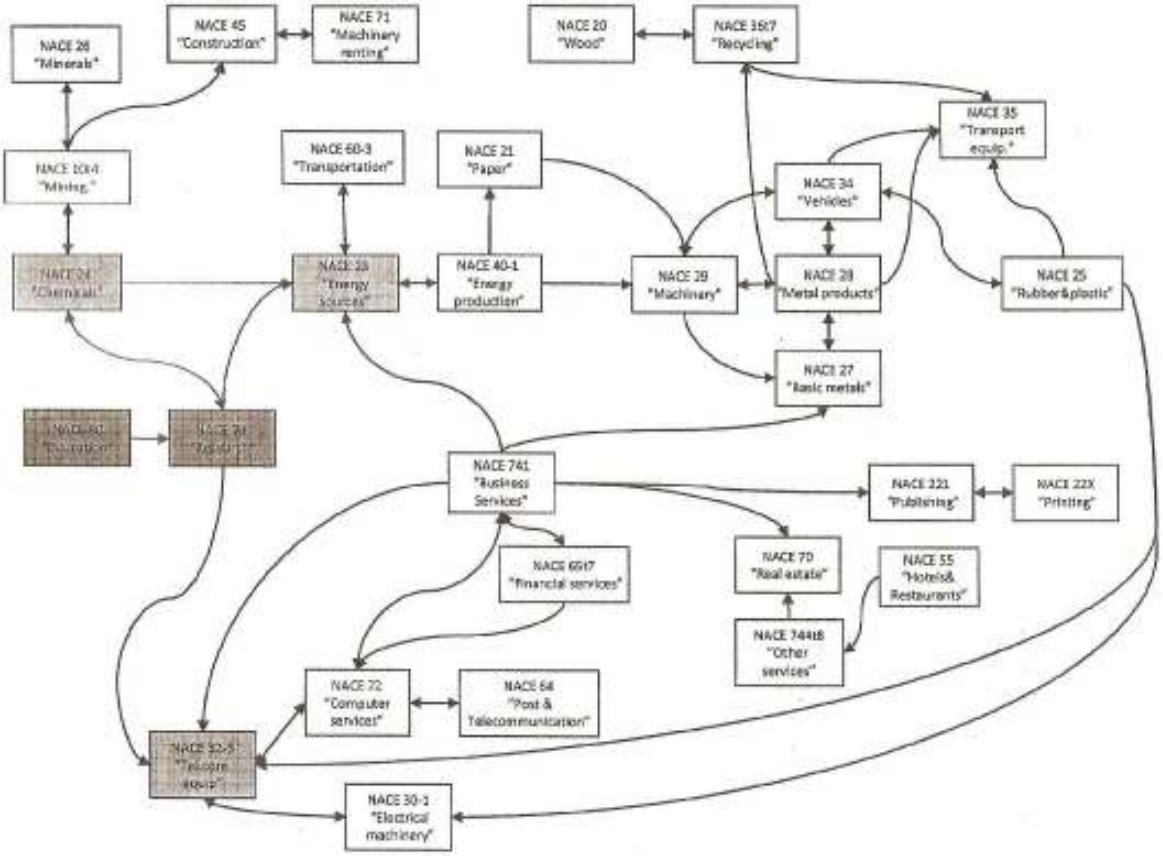

Figure 1. **Employment transition linkages among the industries of Finland's economy from 2000 to 2004**

As it can be seen in Figure 1, all the industries shown in it are directly or indirectly related to each other (sometimes very distantly). However, there are eight other industries that have no significant (neither exit nor entry) labour flows, i.e. their rtp coefficients are less than 1. These industries are agriculture, food, textiles, trade and repairs, technical services, public administration, health and social care, and other social services.

Anonymous individual data from the Labour Force Survey and the NACE classification of industries of Latvia's economy could be used to apply the approach of the Finnish researchers on Latvian empirical basis. At the Central Statistical Bureau of Latvia, data on labour transitions at the individual level are available for the following periods: years 2001 and 2002 as well as January and April of 2007 and the same months of 2008. Since Latvian economy is not as stable as the Finnish one, it would be useful to analyse shorter periods and to compare them. For the purpose of this research, it would be useful to compare the labour flows in 2001/2002 as well as in April 2007/2008 according to the following indicators (LR CSP, 2007):

- indicator C31: during a survey week, a job has been done for pay or for the purpose of gaining profit – for one hour or more (including the working family members, but excluding those in obligatory military service or in public service), responses – *yes* or *no*;
- indicator D49: a country in which the main workplace is located, responses – *in Latvia* or *in another country*;
- indicator D55: a full-time job or a part-time job is performed, responses – *full-time* or *part-time*;
- indicator D39k: the type of economic activity of the main workplace. "Statistical Nomenclature of Economic Activities in the European Community" (NACE 1.1 classification) is used for coding the types of economic activity.

These are the basic indicators that are necessary for identifying Latvian industrial clusters according to labour or human capital flows, however, gender, education, age, nationality, and other characteristics of employees can be used for a further detailed research. The following algorithm is useful for researching the inter-industry labour flows in Latvia:

1) all respondents have to be divided into two categories – employed and unemployed individuals (according to indicator C31);
2) only those working full-time in Latvia have to be selected from the employed individuals (according to indicators D49 and D55);
3) employed individuals have to be classified by type of economic activity (according to indicator D39k);
4) rtp coefficients have to be calculated taking into consideration data of two periods and the calculation logic presented in Table 2;
5) Latvian industries, composed according to labour flows, have to be illustrated graphically.

The problem is that the Latvian statistics used NACE 1.1 classification till 2009, which usually collects information on 17 economic sectors, not detailed industries. Since 2009, statistical data are published according to the European Union's NACE 2 classification. NACE 1 classification was introduced in 1990 and updated in 2002 (NACE 1.1). With the structure of economy changing and technologies advancing, new kinds of economic activity, products, and specialised industries have emerged and become more and more important. The new NACE 2 classification was introduced to reflect these changes and ensure appropriate accounting. It is much more detailed; it consists of 21 sections, 88 divisions, and 615 classes. According to the changes introduced in this classification, position codes are completely changed (LR CSP, 2009). So, the quality of empirical studies, based on Latvian statistics, will also depend on the level of detailed elaboration of anonymous individual data from the Labour Force Survey within the NACE classification.

Conclusions, recommendations

- The input-output approach is usually applied for researching inter-industry linkages, and labour flows transferring knowledge and experience, and being an important instrument for industrial clusterisation based on human capital are ignored in researching an economy in the world.
- Researching inter-industry labour flows in the Latvian economy will allow to extend research on industries for explaining the composition of industries and to introduce a new dimension also in cluster studies, becoming an auxiliary instrument for identifying industrial clusters in Latvia.
- It is useful to apply the methodology of the Research Institute of the Finnish Economy (ETLA) for identifying Latvian industrial clusters based on labour flows, probating it on Latvian empirical basis.
- All the necessary statistical information is at the disposal of the Central Statistical Bureau of Latvia to implement the algorithm of determining the intensity of labour flows in practise and to ascertain the structure of industries in Latvian economy with the purpose of identifying clusterisation processes on the level of industries.
- The analyses of inter-industry labour flows, not inter-sector ones, can significantly help cluster researchers keep up with the clusterisation processes in Latvian economy in the aspect of mobility of human capital and knowledge.
- Taking into consideration the fast restructuring of Latvia's labour market and industries, one can forecast that researching inter-industry labour flows will make a significant contribution to understanding changes in Latvian labour market and life cycles of Latvian industries.

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Gains from Social Capital

Modrīte Pelše, Dr.oec., assistant professor,
Faculty of Economics, Latvia University of Agriculture

Abstract. The author's previous researches on farms show that social capital positively influences the development of rural farms. Therefore the evaluation of possibilities for social capital increase is important. The author indicates gains of social capital increase also on the regional level. These gains are closely connected with the economic growth in different spatial aspects – on local farm and national level with bigger profit, and on local government and regional level with the potential of human capital and its quality saving possibilities. It allows balancing urbanisation processes on the EU level.
Key words: social capital, farms, territorial divisions, economic development.

Introduction

In Latvia's National Development Plan 2007-2013 a well educated and creative human is brought to the forefront as the main factor of development to achieve the high standards of living for societies and individual of highly developed countries our main resource is population's knowledge and wisdom, its efficient and targeted application (Nacionālais attīstības plāns 2007-2012, 2006).

There are ever growing evidences that intellectual capital influences more and more the effectiveness of use of traditional resources. Individuals build society; connections between them are always in process and they are grounded on mutual reciprocity and social networks. This interaction process shows elements of social capital, like mutual trust, informal networks, cooperation and cohesion. Social capital is not enough explored object in economic activities and regional development studies in Latvia. Effects that accompany better developed social networks, trusting and success of cooperation are still absent in many development researches.

The aim of the paper is to evaluate gains of social capital in spatial dimension in Latvia. The main research tasks are the following:

1) to outline most acknowledged concepts of social capital impact in the spatial context;
2) with experts' help to evaluate gains from farmers' social capital increase on different spatial levels.

The research hypothesis is that the increase of farmers' social capital has positive impulse on the economic growth on different spatial levels. Monographic, abstract-logical as well as hierarchy and pair methods were used in the research.

Results and discussion

In peer reviewed literature the concept of social capital has essentially different interpretations. Many authors have recognised that social capital has many elements, it is a resource. There are two things that shall be noted: first, social capital consists of some aspects of social structure, and second, elements of social capital facilitate certain actions of actors within the structure (Piazza-Georgi B., 2002). In his turn M. Woolcock (Woolcock M., 2001) in his research of social capital point out that each individual social network and trust level is closely connected with the society. M. Woolcock has also studied organisations' social capital and free market's self-organising capability, stressing D. Hume and A. Smith idea of very big and complex systems, capable to organise themselves without outside planning and authorities.

The concept of social capital is based on the idea that social relations and norms give opportunity to reach valuable resources and improve individual welfare (Fafchamps M., Minten B., 2001), families' welfare (Narayan D., Pritchett L., 1997), communities (Bowles S., Gintis H., 2002), and even regional and national growth (Knack S., Keefer P., 1997).

Although many researchers point out fact that social relationships have important effects on economic success and it has sound theoretical and empirical background; however the influence of sociological factors in the context of regional economic problems is still unclear (Burt R., 2004; Durlauf S.N., Fafchamps M., 2004). On enterprise as well as local and regional level social capital could be considered as feature of social organisation system, for example trust, norms, or collaboration which improves society's efficiency (Wolz A., Fritzsch J., 2005). Also there should be taken into account fact that these are qualitative categories that are difficult to measure. One of the biggest problems is lack of appropriate statistical data. Practically variables in researches are supported by the availability of data and not theoretical considerations.

Initially the concept of social capital was used in the sociological researches, but recently this concept is widely used in researches on social context of organisations and companies as well as of internal relationships between branches and inside organisations (Jacobs J., 1965, Burt R., 1992, Nahapiet J., 1998).

Social capital influences the exchange rate of the resources and their combinations between organisation's structures, and it has a positive impact on the implementation of innovations (Tsai W., Ghoshal S., 1998). Diverse success of enterprises can be explained by the interaction intensity among

actors of social networks (Adler P., Kwon S. W., 2002). Social capital can induce the productivity of an enterprise. Also it can help lower costs significantly as compared with competitors (Greve A., 2003).

Thus, an understanding of social capital is substantially broadened and thanks to networking, there is an opportunity for:

- increase of productivity and profit;
- gaining of new business partners;
- achieving of more extensive information;
- developing closer collaboration and co-operation;
- getting a sense of security, trust etc.

Social capital provides all these gains. A gain is a result which is acquired to be in possession or at one's disposal. Such a definition is more appropriate for economic studies as economic activities of people and motivation for economic activities are places in the centre of economic theory.

In Latvia a few scientists have done research on social capital; though in quite narrow aspect. There were no researches on social capital in the economy up to the beginning of the 21st century. Contribution to the study of social capital have resulted in several publications of the author of present study (2006, 2007, 2008, Pelše M.; 2005, 2007, Strīķis V., Pelše M., Leikučs J.). Analysing and evaluating the literature on social capital the author has made her own interpretation of social capital - as all those goods in mutual relationships that are created in networks of social structures and which influence action of individual agent (Pelše, 2006).

Thirty-two per cent of Latvia population lives in rural areas. Farming as the main preoccupation prevails in many rural areas. Farm is one owner's property, which produces agricultural goods, and the main production resource is land. In this research agriculture is considered as production of goods but not the type of subsistence economy.

The author has participated in researches of Zemgale region farms social capital between 2002 and 2007. The analysis of the results shows that social capital increase has important effects on farmers, their economic activities, and regions. The author has come to the conclusion that the development of farm affects not only the owner's well-being, but also local government, region and country in general. Therefore it makes sense to stimulate the increase of social capital of farmers. If social capital is developed, it positively influences labour force in the farm, additional financial investments, improves human capital and leaves positive impact on the region in general.

Taking into account the results of social capital research projects in 2005, 2006, and 2007 in Zemgale, the author has created several scenarios for the increase of social capital. Five experts analysed and evaluated the scenarios. Each expert had to be especially competent in the following level activities:

- farm;
- local governmental;
- regional;
- national;
- the European Union.

These activities of levels are a group of criteria. The hierarchy analysis was used for the evaluation of social capital increase scenarios, and the results were published in 2007 and 2008. Each arm activity and impact levels contain five components (Figures 1-5) which are most important in each of the level. Components were selected according to social capital increase possibilities. The hierarchy analysis can be used to evaluate each component's role in achieving the biggest gain in case of an increase in farmers' social capital.

However taking into account that components are too many, the author has used a pair-wise analysis developed by Vicki Wilde for FAO "Socio-economic and Gender Analysis Programme" (SEUDA) studies. The pair-wise analysis is an instrument allowing to identify the biggest problems, and to arrange comparable elements by their significance. It allows easier to compare priorities of different people (Wilde, 1998).

An example of this analysis is shown in Table 1. In this case an expert for most important gain has stated opportunity to get additional profit, and not the possibility of guaranteed job. So, in Table 1 the second component ("additional profit") is more relevant (fourth column, second

Table 1

Comparison of components of farm interests by Expert B

Components	No	Guaranteed jobs	Additional profit	Family traditions	Increase in information supply	Opportunities of informal relations
		1.	*2.*	*3.*	*4.*	*5.*
Guaranteed jobs	*1.*	×	2	3	4	5
Additional profit	*2.*		×	2	2	2
Family traditions	*3.*			×	3	3
Increase in information supply	*4.*				×	4
Opportunities of informal relations	*5.*					×

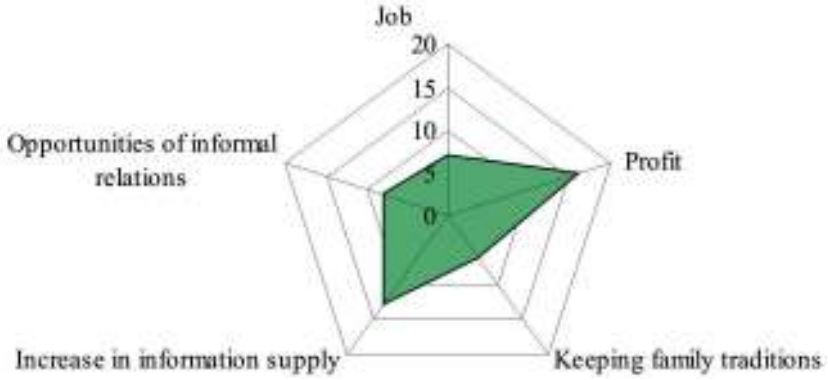

Figure 1. **Farm interests in social capital increase**

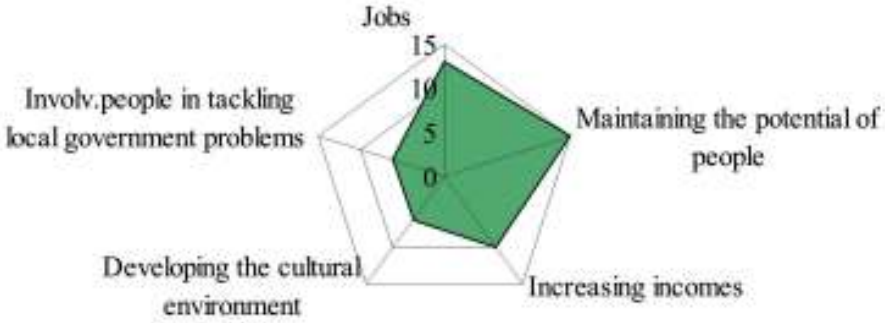

Figure 2. **Local government interests in social capital increase**

Figure 3. **Regional interests in social capital increase**

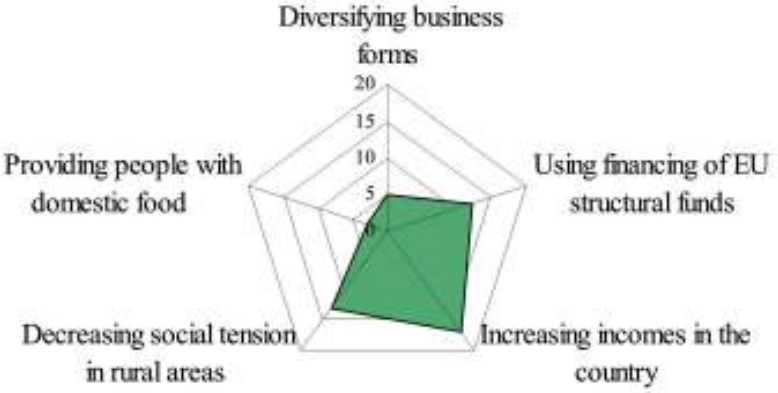

Figure 4. **National interests in social capital increase**

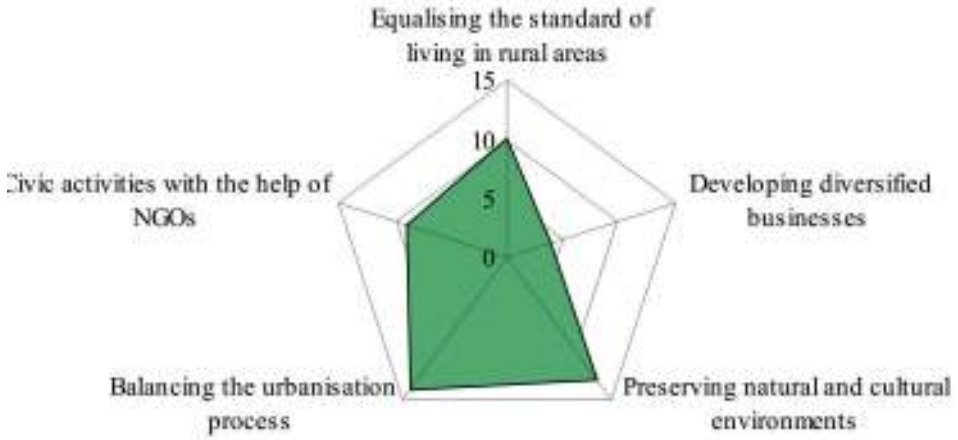

Figure 5. **The European Union interests in social capital increase**

line). The next column in the same line shows to Number 3 ("Family traditions"), which means that Component 1 is less relevant than Component 3. Increase of Information supply has also been considered more relevant than Component 1. In this manner expert B has filled in all lines. Afterwards it is possible to range each component on all farm activity levels mentioned previously.

Evaluation of criteria group components

The results were summarised in Vienna diagram taking into account the **farm range of interest** after each expert had evaluated the role of components in achieving the biggest gain in case of an increase in farmers' and their family members' social capital (Figure 1). Components and their frequencies stated by experts are placed on co-ordinates. Experts compared gains of social capital increase, and stated the most relevant opportunity for additional profit (Figure 1) arising from new knowledge, mutual relations, cooperation, and innovative ideas. The components "Access to more information" and "Keeping family traditions" have also high position.

Farmer's work is closely connected with local territory, which in fact is governed by the local government. Therefore the local government is interested in farmer's activities and social capital increase. Experts' evaluations of local government interest regarding the increase of social capital is shown in Figure 2.

The most voted component was the fact that the increase of farmer's social capital gives opportunity to save the potential of people in local government. It is connected with the fact that in case of farm's development, all aspects directly involved in farm's business create safe local people potential in the future. The component "Jobs" (maintained and new job places) got the same relevance. The component "Developing the cultural environment" and "Involving people in tackling local government problems" got low and similar rating.

From the point of view of regional interests the increase of social capital is connected with the development of rural territories and discrepancies between regions. Experts rated five components and results are shown in Figure 3.

According to the experts human capital and its activities in the region received the highest rank among all components. The potential for social activities' increase has one of the highest ranks in social capital. A feature of social capital to stimulate and implement new projects in rural areas as well as attracting resources for rural areas is also an important factor in regional aspect. Preserving food processing enterprises is classified as the fourth in rank. They are employers and income producers on the regional level, while farmers supply them with raw materials. The role of social capital in preserving and diversifying the landscape has the lowest rank in this group of criteria.

National interests in the increase of farmers' social capital and potential gains in experts' viewpoint are shown in Figure 4. Experts ranked gain for the state farmers' income increase as the most valuable and it corresponds with ranking in Figure 1, where gain from the increase of social capital provides greater possibility of additional profit.

Experts highly evaluated the decrease of social tension in rural areas, and increase of additional financial investments due to the increase of social capital. The component "Providing people with domestic food" has the lowest rank in this group of criteria; experts have not given many points to social capital role in this matter.

The European Union interests were evaluated as the last group of criteria. Experts ranked five components and the summary of their evaluations is shown in Figure 5. The component "Balancing the urbanisation process" got the highest position. The lowest rank was assigned to the component "Developing diversified business" and the role of social capital has been considered of little importance.

In summary the author may state that experts in all groups of interest accepted each component as important, because there is no component in the groups which was never mentioned in the evaluation matrix. Thus all of them may be considered as important gains of results of social capital increase.

Conclusions

The experts have given the higher rank of potential gain of social capital increase to the following components:

1) in farms interests group – possibilities of additional profit;
2) in local government interests group – possibility to maintain the potential of people;
3) in regional interests group – activities of human capital increase;
4) in national interests group – income increase;
5) in the EU interests group – balance of urbanisation process.

The component connected with additional profit and income increase had the highest rank in farms interests and national interests groups. It illustrates social capital as value. Also in other groups of interest the gains of social capital increase more or less are connected with the maintaining and increase of resources. The hypothesis raised in the introductory part of the research, is proved during the study.

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Analysis of Labour Environment Factors Impacting the Productivity of Employees

Ligita Bite, Dr.oec. assist.professor, Faculty of Economics, Latvia University of Agriculture
Aina Muška, Dr.oec. assist.professor, Faculty of Economics, Latvia University of Agriculture

Abstract. The authors have researched an impact of the quality of labour environment on the productivity of employees. The most essential factors of labour environment, which significantly impact the productivity of employees in an enterprise, were identified and analysed in the research. They are as follows: social factors, factors of working conditions, labour intensity factors, and labour factors. After completing the research, the authors concluded that an imperfect labour environment in enterprises causes a substantial loss to employers, as it includes both wasted time of employees and material damage to fixed assets and lost working days due to illness of employees and obstacles to the production process, which impact the productivity of any enterprise.
Key words: labour environment, productivity, employee.

Introduction

More and more attention is being paid to the human factor in a labour environment in Europe and in the world. Labour environment, safety, human health, comfort, and efficiency at any workplace are improved by taking into consideration the physical and psychological abilities of individuals. The number of individuals suffering from stress and psychological violence at their workplace has increased in a modern labour environment. According to the information of the European Agency for Safety and Health at Work (Bilbao Agency), more than one of four employees in the European Union is subject to stress at their workplace. It is related to reducing the reputation of enterprises and loosing working time at enterprises, which impacts their productivity and competitiveness at the labour market.

Employees whose work significantly impacts the performance efficiency of enterprises are one of the most important and often the most expensive resources for enterprises. Employees are the most complex and hard-to-understand resource of an enterprise, as there are a lot of subjective and objective conditions impacting their working efficiency.

Regarding labour productivity, specialists admit that it is hard to define this term in a precise way corresponding to all the areas of activity of enterprises, since productivity, in its essence, is a measure of efficiency. The labour efficiency of an enterprise is ensured by a well-planned strategy, a perfect labour environment and work organisation, a targeted and efficient use of resources, a solid and loyal team of employees, and effective internal communication (Lāmanens, K., Tominens, K,. 2007).

Therefore, the following **hypothesis** is set forth: the productivity of employees at an enterprise is impacted by a set of labour environment factors.

The research aim is to investigate the most significant factors of labour environment, which impact the productivity of employees.

The factors of labour environment, which impact the productivity of employees, can be researched quantitatively and qualitatively. The paper presents a qualitative research.

The following **research tasks** are set forth to achieve the aim:

1) to identify and characterise the most significant factors of labour environment, which have a substantial impact on the productivity of employees;
2) to analyse the satisfaction of employees through factors determining the quality of labour environment.

The following research methods were used in the research: monographic, statistical, graphical, and logically constructive.

Latvian and foreign studies on the respective area as well as data of the Ministry of Welfare, Eurostat, and the State Labour Inspectorate were used in the research.

Results and discussion

Any labour environment creates working conditions for individuals, which play a significant role in performing social functions and ensuring the quality of life in relation to health. The quality of health of employees is impacted by physical functions - a feeling of comfort, a psychological status, and somatic feelings. The authors suggest classifying the factors shaping labour environment, which impact the productivity of employees, into four basic groups:

- social factors;
- factors of working conditions;
- labour intensity factors;
- labour factors.

The demographic situation is the most significant ***social factor***, which is characterised by life expectancy and situation in the labour market that is related to it. According to a study by Krīgers (Krīgers P., 2007), males in Latvia live on average

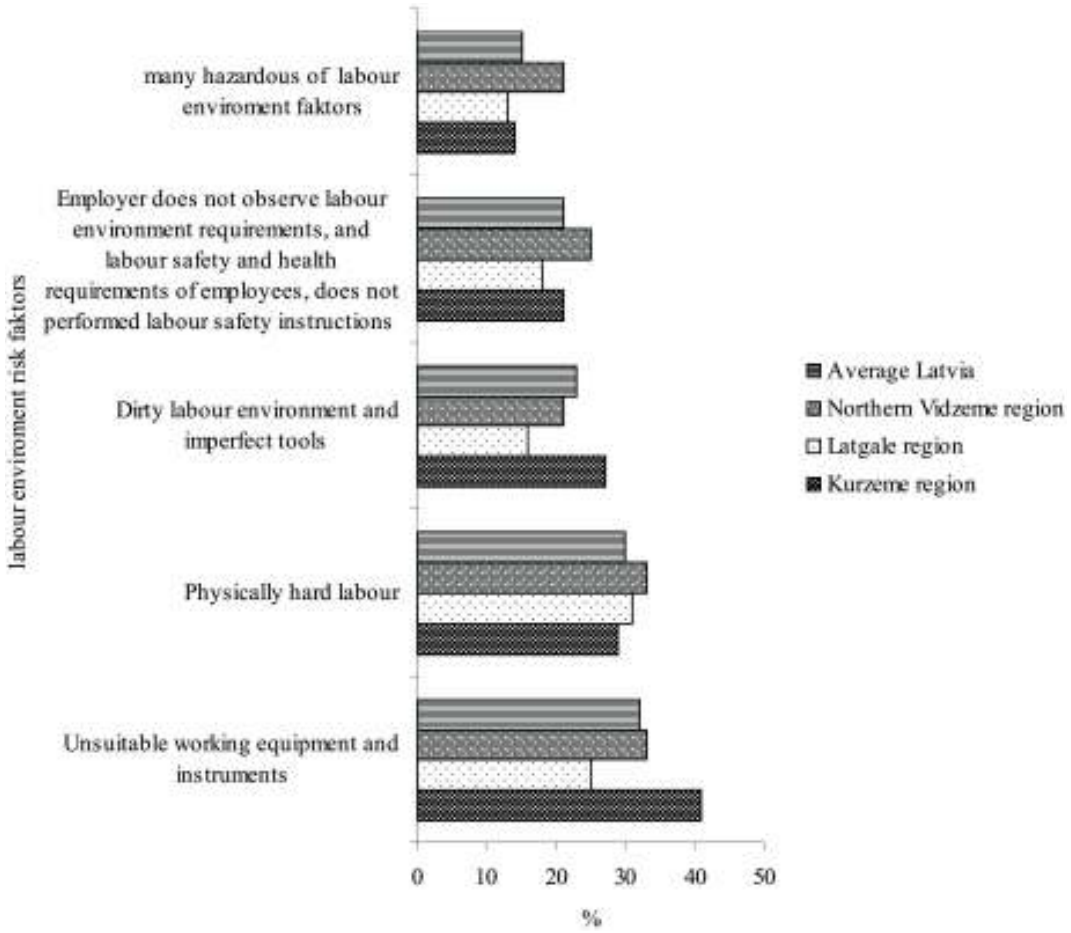
for 64.5 years, whereas in Europe – for 78 years on average; women in Latvia live for 75-76 years, while in Europe – for 80 years on average. Such a situation in Latvia is related to the low standard of living, an imperfect labour environment, and poor working conditions. There is a large inequality between genders both at work and outside it. This inequality has arisen mostly from gender segregation in the labour market, as a number of individuals of a particular gender decrease in several professions. The analysis of labour markets in the EU candidate countries, where the number of working women is greater, showed that the distribution of genders among categories of various professions is more balanced and there is smaller vertical segregation. It indicates that such a disbalance is not unavoidable (European Foundation for...2008). Two aspects have to be taken into consideration in relation to the ageing of individuals. First, it is a constraint of age, which is caused by the lack of balance between working conditions and labour intensity; it decreases with the increase in age. Second, a job might have to be quit due to physical and mental deterioration. A study of the European Foundation for the Improvement of Living and Working Conditions revealed alarming trends. Due to the fact that a deficit of young employees increases, employees of the medium age group (aged 35-45 years) admit that they perform hard physical jobs more and more often. Besides, due to the existence of criteria in selecting employees by age, pushing older employees out of several kinds of work is observed (night work, work having a final term, work with new technologies). Activities for reorganising labour environment are necessary to avoid premature physical and mental deterioration as well as to enable individuals to stay at their jobs (Eiropas dzīves un... 2008).

The most significant ***factors of working conditions*** (physical, chemical, and biological factors belong to this group) include a microclimate inside work premises, which might cause pathological changes in the organism of employees, either overheating the organism or cooling down it excessively. A burden on the heart and blood vessels rises on unfavourable microclimatic working conditions (Izrailietis Ļ., Trahtenbergs I., 1978). Intensive noises and vibrations are one of the main unfavourable factors of labour environment, as an impact of noises can also cause the so-called after-effects that impact working capabilities very negatively. Noises also increase a number of errors at work and at the same time a number of industrial accidents. A disorder of hearing, which is caused by noises, is one of the most spread ceaseless occupational diseases, and around 120 million people suffer from it in the world (Eiropas dzīves un ... 2008).

According to a study conducted by the Ministry of Welfare, 45% of employees in the wood processing industry, 80.5% – in furniture production, 55.4% – in construction, 55.2% – in manufacturing, and 62.1% – in education are subject to noises at enterprises in regions of Latvia (LM pētījums, 2007).

Work intensity (ergonomic) factors include: physical efforts, a pose at work, work monotony, nervous tensions, a work rhythm etc. which significantly impact the productivity, working capabilities, and health of employees. Different individuals have different paces of working. Rhythm, sequence of works, regularity, and flexibility are very important to any pace of working, which are the prerequisites for high productivity. Any employee needs to learn to plan his/her working day, week, and month.

Labour factors include work stress, working capabilities of employees, fatigue, emotions, working conditions, architectonics and a design of work premises as well as psycho-social and organisational risk factors of labour environment. According to the authors, an employee's fatigue is a condition of the organism, which arises after a tense and durable work. It is characterised by a decrease in working capabilities as well as a decrease in the organism's ability to resist infections and other diseases. An employee's fatigue can be increased by a monotonous work, a lack of interest, an unfavourable emotional condition, working conditions, and unfavourable conditions of the surrounding environment. An individual's physiological indicators characterising tensions during performing different works are very much impacted by emotions. From the point of view of physiology and medicine, emotions have to be viewed as an individual's most important adaptation reaction enabling him/her, on the one hand, to overcome complex situations, while on the other hand, to better perceive everyday life. Joy, creative inspiration, public and private achievements, and successes help individuals overcome hardships and cope with complex tasks. Fears and resentments depress any individual, make him/her reluctant to any work and lazy, and decrease his/her working capabilities. Positive emotions increase an individual's working capabilities and help him/her gain success at work. Stress and the syndrome of burnout are also included into this group. Stress at work depends on working conditions and an employee's attitude to it. Stress situations require more attention at work, which does not correspond to an individual's physical and mental capabilities. Stress at work is strengthened by a lack of control over executable tasks, a lack of support of colleagues and conflicts at work, including conflicts with administrators. There is a large labour turnover, absences from work due to sickness are frequent, indicators of time spent on creative work and relations with their clients worsen at enterprises paying no attention to avoiding stress causes (Roja Ž., 2007, Darba vides riska..., 2001). The syndrome of burnout becomes apparent as a state of exhaustion of an individual's energy. Due to large workloads on conditions of inappropriate material and mental rewards and due to insecurity about tomorrow, individuals start feeling an emotional discomfort and are in continuous tension till they fall into despair or start protesting. Employees with low self-respect, workaholics, those needing



Source: made by the authors according to the Ministry of Welfare data

Figure 1. **Reasons for employee dissatisfaction with the labour environment and working conditions in enterprises of the regions of Latvia**

internal competition, those who are aggressive and impatient, those lacking attention to their own needs, and those being in physical and psychological isolation are more subject to the syndrome of burnout (Ancāne G., 2004).

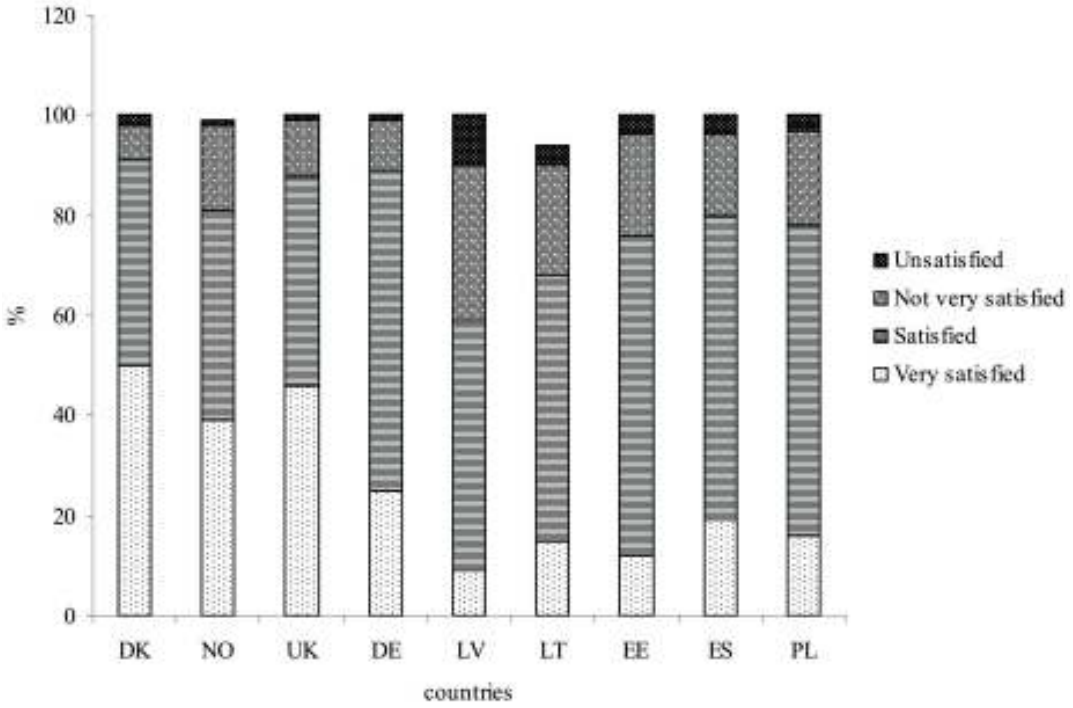
The productivity of employees is impacted by working conditions (Darba apstākļi un ..., 2004) which include:

- labour environment which includes all material aspects forming the surrounding environment (conditions) in which any work is done: safety conditions, presence of chemical or biological contamination etc;
- requirements determined by the task of work: efforts, body's position, attention, monotony etc;
- work organisation which determines how the working process is split into several operations among particular employees, including the division of working hours, the pace of work execution, and mutual relations that emerge at workplaces;
- education of employees as a kind of necessary knowledge, a level of training of employees, a kind of work organisation, and working hours;
- work intensity is impacted by direct demand, work of colleagues, output targets, direct control of managers, and a speed of equipment automatic operation;
- satisfaction of employees with their job are ensured by rewards, career possibilities, a way of management, awards and acknowledgements, a type of work, communication, non-monetary benefits and privileges etc.

By analysing the satisfaction of employees with their labour environment and working conditions, it can be observed that most of the employees in enterprises in the regions of Latvia are rather satisfied. The number of employees that are not particularly satisfied does not exceed 20%. A stable job and good wage as well as social guarantees increase their satisfaction.

However, the dissatisfaction of employees in enterprises of the regions of Latvia is aided by the hazardous labour environment factors, physically hard work, and dirty labour environment.

As it can be seen in Figure 1, employees of Kurzeme region are not satisfied with the fact that their workplaces have many hazardous risk factors



Source: made by the authors according to the materials of the European Fund for Improvement of Life and Working Conditions (Eurostat, 2009)

Figure 2. **Employee satisfaction with jobs in the EU member states in 2008, %**

of the labour environment. Employees of enterprises in Latgale region and the Northern Vidzeme region are not satisfied with the physically hard work and the unsuitable environment for executing work. Therefore, one can conclude that the working conditions classified as hazardous lead employees to diseases or to a decrease in their working capabilities, which in turn impacts the productivity and competitiveness of any enterprise.

In general for the majority of European employees, their jobs seem to be a positive experience bringing satisfaction – more than 80% out of the 29980 surveyed employees believe they are satisfied with their working conditions and labour environment.

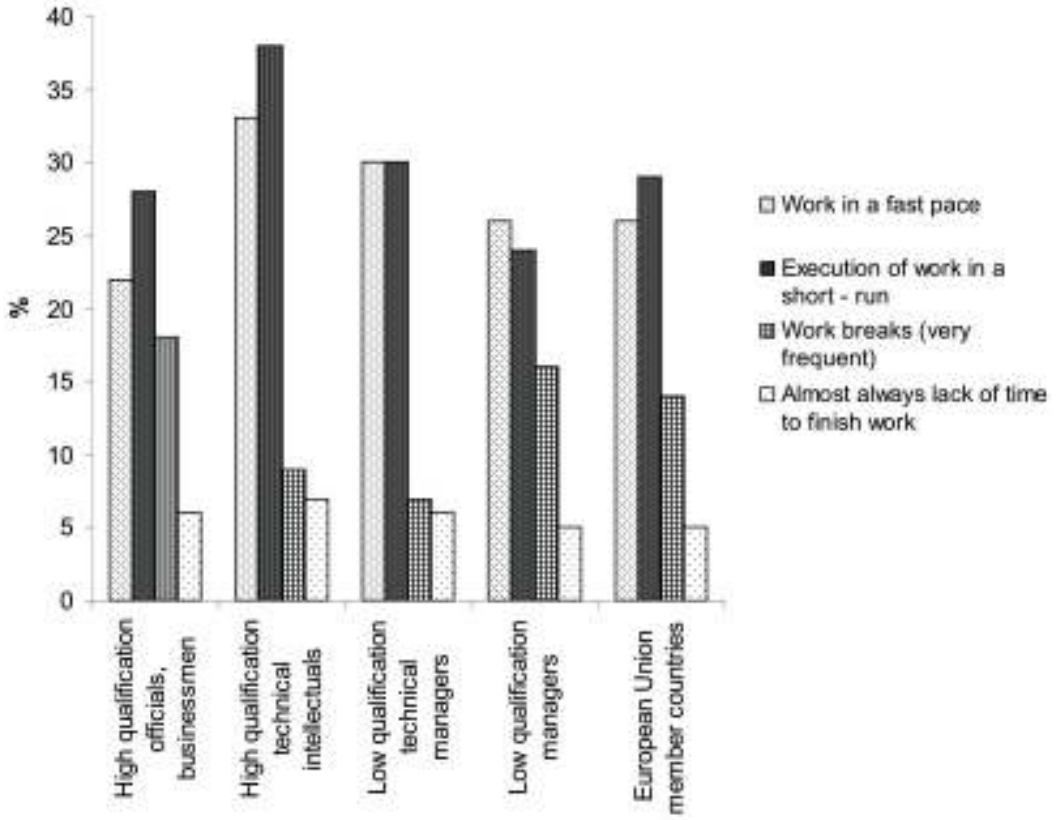
Figure 2 shows that only 9% of Latvian employees are very satisfied with their working conditions and labour environment. This indicator is below the average EU indicator which is 19%. On average, 4% of the EU respondents were not satisfied with their jobs, while in Latvia it was 10% (Eiropas dzīves un ..., 2008**)**.

According to a study conducted by V. Kaļķis, Ž. Roja and other authors (Kaļķis V., 2002, Roja Ž., 2007., Джой – Меттью Д...., 2006.), a greater satisfaction with jobs and labour environment quality is promoted by: an understanding of decent wages, greater independence and work control, higher intellectual requirements regarding a job without excessive work intensity, and career development possibilities. However, a lower level of satisfaction is related to long working hours, high work intensity, low work control, and being subject to physical or psychological and social hazards which cause health disorders during the work process. Those employees who believe that their jobs influence health, and their health and safety is endangered at the workplace, are five times more unsatisfied with their jobs as compared with those who believe that their health is not influenced or endangered at the workplace.

A study conducted by the Ministry of Welfare on the satisfaction of employees with their working conditions and labour environment proved that the satisfaction is increased by a safe, stable job and a stable wage – 44% of 1841 respondents admitted it; an interesting, creative, dynamic, multiform job – 41%; social guarantees – 40%; a high wage – 38%; good personal relations with colleagues – 33%; good and safe working conditions, and a perfect labour environment – 17% (Darba apstākļi un..., 2007).

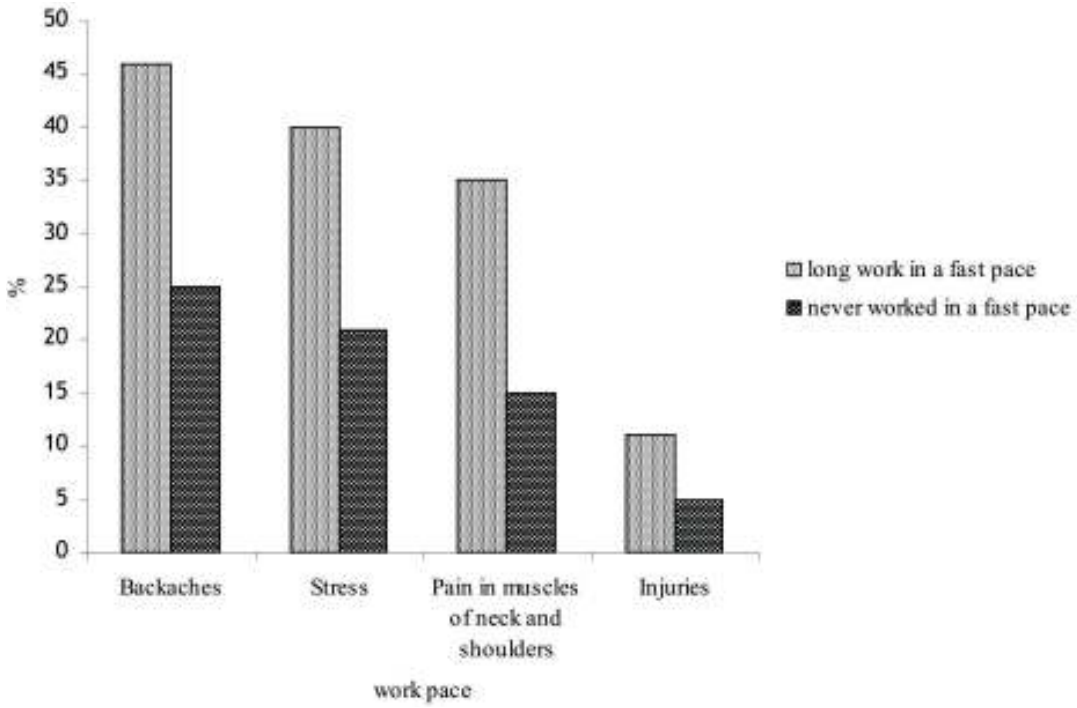
Work intensity as well, significantly impacts the productivity of enterprises. The authors of the paper believe that the higher is work intensity, the bigger risk exists for a decrease in productivity. Its impact is observed in all European Union countries, in all sectors of the economy as well as in all kinds of economic activity. Such intensification can be explained by a certain type of tolerance in relation to work burden, the nature of which has become much more complicated.

According to Figure 3, the highest work intensity is specific to high qualification employees of technical intelligentsia: 33% (29980 respondents) of these employees. Work intensity is impacted by direct



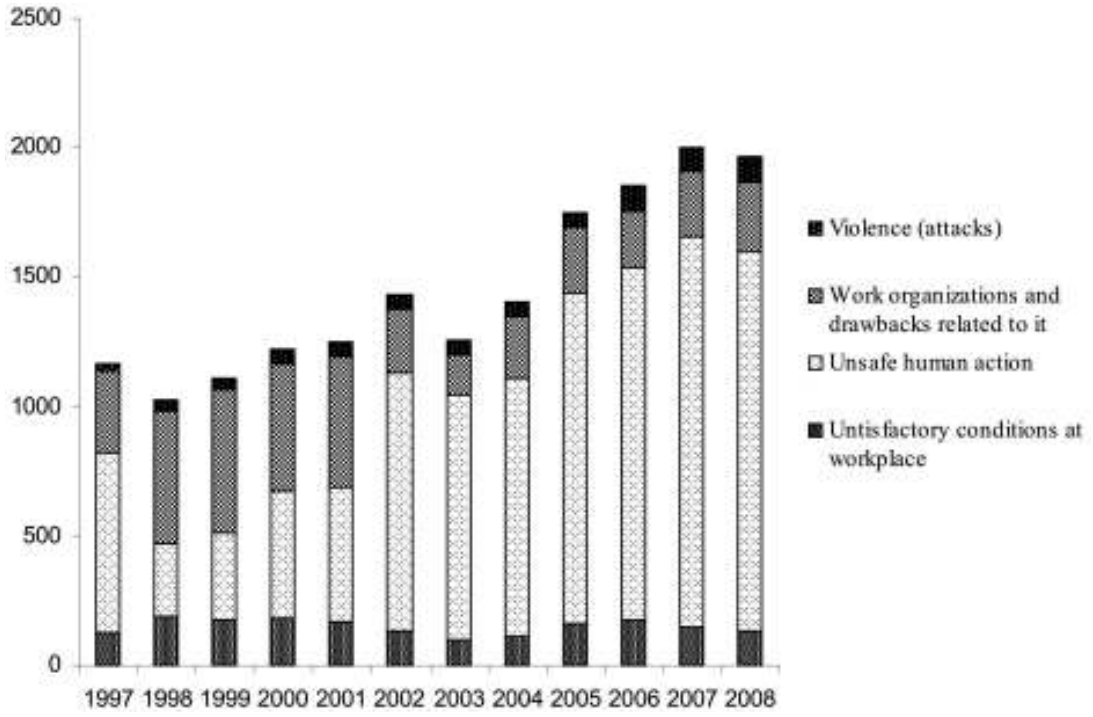
Source: made by the authors according to the materials of the European Fund for Improvement of Life and Working Conditions (Eurostat, 2009)

Figure 3. **Work intensity level in EU member countries in 2008**



Source: made by the authors according to the materials of the European Fund for Improvement of Life and Working Conditions (Eurostat, 2009)

Figure 4. **Health problems related to intensive work in the EU in 2008**



Source: author's studies according to the State Labour Inspectorate data

Figure 5. **Impacts of imperfect labour environment on industrial accidents in economically active enterprises in the regions of Latvia during 1997-2008**

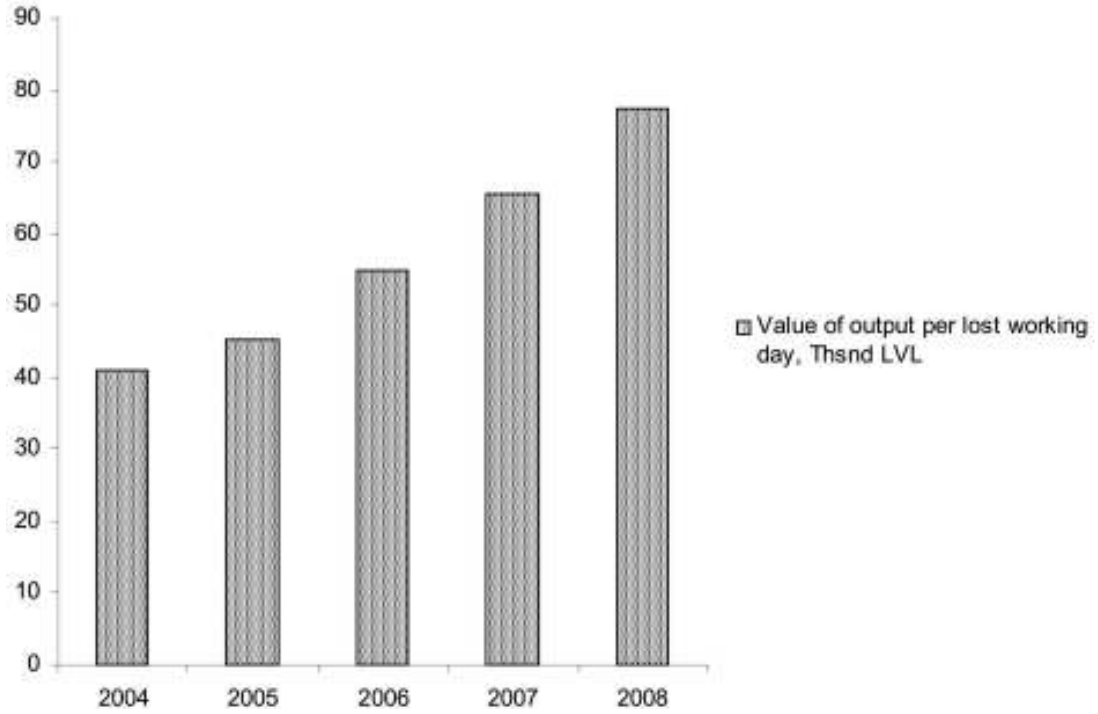
demand, work of colleagues, output targets, direct control of managers, and a speed of equipment automatic operation. Those employees whose work intensity depends on the speed of equipment automatic operation or output targets face physical health problems more frequently. These employees perceive their work as more intensive and strained, and their level of independence is lower. On the contrary, those employees whose work intensity is set by direct requirements of customers have higher rates of psychological health.

Work intensification is directly related to causing stress, disorders of muscles and skeleton, psychological attacks and violence at workplaces, which is a logical consequence of the increasing lack of time, thus negatively impacting not only the health of employees, but also their productivity. According to the EU study data, employees, at their workplaces, mostly suffer from muscle and skeleton diseases, especially the lower part of spine, and from health disorders caused by psychological stress. These diseases are usually related to being in a forced working pose (work with a computer) for a long time and to performing a maximum workload. It often causes the absence of employees at work or even the loss of their working capabilities.

According to Figure 4, after working intensively for a long time, 46% of the respondents have gained backaches; diseases caused by stress have increased among 40% of the respondents. It becomes more difficult for employees to cope with the above mentioned problems. In general, employees are subject to violence or threats of violence in the Northern Europe – a rate that is higher than the EU average rate (6%) is observed in the Netherlands (10%), the United Kingdom (9%), Ireland (8%), and Latvia (4%) (European Fund for Improvement of Life and Working Conditions, 2008).

Enterprises having an imperfect labour environment and poor working conditions, industrial accidents used to occur more frequently, which in turn impact the productivity and competitiveness of enterprises. According to data of the State Labour Inspectorate, one can see that the work organisation, unsatisfactory working conditions, and unsafe actions of employees at enterprises still significantly impact the number of industrial accidents. It is very possible that during the economic crisis their impacts will increase because many employers try to save funds at the expense of work safety.

Figure 5 shows that a very large increase in unsafe actions of employees has been observed since 2003, and it has not decreased also in 2008 when the economic situation worsened in the country. However, a decrease in the impact of work organisation was observed in 2003, but since 2004 this cause has steadily increased, thus the largest part of employees has a low self-appraisal and a sense of guilt in their work teams. All the respondents report having limited working hours and short deadlines for executing their tasks at work. It implies that there are big problems in their work organisation and lack of human resources. The employees suffer from uncertainty and a lack of information regarding changes in their jobs, especially from radical changes. The employees pay insufficient attention to physical activities related to relaxing exercises during breaks at work and to physical activities at all. Therefore, it may be



Source: calculated by the author according to the State Labour Inspectorate data

Figure 6. **Value of output per lost working day in Latvian enterprises in 2004-2008, thou. LVL**

concluded that many employers do not understand how a labour environment impacts the productivity and competitiveness of their enterprises.

According to a study conducted in 2007 by the European Agency for Safety and Health at Work, in the EU countries health disorders related to work cause a loss of 2.6-3.8% of the EU gross domestic product and a loss of 600 million working days, which amounts to at least EUR 20 billion a year. Entrepreneurs prefer a long-term use of their capital, however, not all of them remember that the most important capital of their enterprises is their employees and in order to ensure the working capabilities and productivity of employees, funds have to be invested in them.

According to data of the State Labour Inspectorate, it may be concluded that 327492 working days are lost, fixed assets, buildings, and constructions worth LVL 1.3 million are damaged, and, based on sick-leave certificates, LVL 1.3 million are paid to the victims in an eight year period in the result of industrial accidents. The largest numbers of working days are lost in 2005 and 2008, respectively 15.9% and 14.4% of total loss of working days.

The authors have analysed values of output for every lost working day in more detail.

Figure 6 shows that one lost working day causes a quite large loss to an employer, as no quality products are produced. The value of non-produced products per every lost working day rises year by year. If the average number of lost working days a year increases by 1147 days, one can conclude that a total loss rises by LVL 3107.6 thousand if estimated according to the daily loss in 2008.

Conclusions

1. There are several groups of labour environment factors, which impact the productivity of employees and the performance of enterprises. Therefore, environment employers have to take into consideration that the health of employees is maintained in their labour by introducing tough requirements for labour environment that is safe and harmless to human health. Owing to it, enterprises can increase the motivation and productivity of employees.
2. The level of employee satisfaction with the job and labour environment is low in Latvia. The main reasons for it both in the whole country and in the regions are physically hard work and inappropriate work equipment and instruments.
3. The satisfaction of employees with their job can be increased by good working conditions, social guarantees, medium work intensity, and career possibilities.
4. An imperfect labour environment in enterprises causes a substantial loss to employers, as it includes both wasted time of employees and material damage to fixed assets and lost working days due to illness of employees and obstacles to the production process, which impact the productivity of any enterprise.

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Determination of Human Resource Capital Priorities in Rezekne City Development

Daina Znotiņa, Mg.soc.sc., lecturer, Rēzekne Higher Education Institution,
PhD student at Daugavpils University
Lienīte Litavniece, Dr.oec., associate professor, Rēzekne Higher Education Institution

Abstract. Human resources are a type of resources which have an important impact on the economy. The authors of this paper have studied the capital of human resources on the macro-economic level, and analysed different explanations of the concept "capital of human resource" in the scientific and practical literature.
The particular study is based on the research aim: to determine the priorities of human resource capital and sectors of the economy in Rēzekne city development. The authors have also analysed the employment situation in Rēzekne for the period of 2004-2009.
The research hypothesis: it is possible to use human resource capital effectively by determining several priorities for sector development in Rēzekne, which are not valuated enough at the present situation.
The set hypothesis is proved, i.e. the human resource capital would be purposefully kept and used for the city in case some priorities enhance the city development.
The authors have questioned experts, then analysed the results and provided proposals for using human resources capital in the future.
The research results can be used in the strategy of Rēzekne city development; besides students can use the results for their studies and scientific papers.
Key words: human resource capital, sectors, employment, expert questionnaires.

Introduction

Personnel are considered to be a capital in the business world, since they invest their knowledge, skills, achievements, and earn profit. Transforming this sample to the state scale, one can say that the human resource aspect is lost, while concentrating on financial resources (for example, increasing income and cutting down expenses).

The research aim: to determine the priorities of human capital and sectors for Rēzekne city development.

The following tasks are advanced to reach the set aim:

1) to study the theoretical aspects of human capital;
2) to inquire the experts, and determine the priorities of human capital and sectors in Rēzekne city development;
3) to make conclusions and provide proposals to improve the city development.

The research hypothesis: it is possible to use effectively human resource capital by determining the priorities for sector development in Rēzekne which are not valuated enough at the present situation.

The set hypothesis is proved, i.e. the human resource capital would be purposefully kept and used for the city in case some priorities enhance the city development.

The authors have inquired the experts and analysed the results. The priorities of human capital and sectors in Rēzekne city development have been pointed out in the research.

The research methods: logical analysis and synthesis, and the Hierarchy Analytical Process or AHP method.

Research methodology

The situation in the sphere of human resource employment in Rēzekne has been analysed during the research. The employees were divided into 5 groups (according to the hierarchy of priorities – the 2nd level) and the national economy was divided into 3 groups (according to the hierarchy of priorities – the 3rd level) by means of the analysis method.

The Hierarchy Analytical Process or AHP method, created by the American scientist T. Saaty, was used for the development of the paper. The hierarchy pyramid of the research is divided into three levels (Figure 1):

1. general target is set on the first level – to promote the development of Rēzekne city;
2. five criteria groups are placed on the second level: entrepreneurs interests;
   - interests of local government officials;
   - interests of state government officials;
   - interests of officials working in the European Union institutions;
   - interests of those working in other spheres.
3. three alternatives are defined on the third level:
   - development of mining industry;
   - development of manufacturing sector;
   - development of service sector.

Two experts were attracted to define the priorities using the AHP method. Their professional position and experience or competences are very important to evaluate the offered priorities for the development of Rēzekne. The following specialists were chosen as experts:

Source: made by the authors

Figure 1. **The hierarchy pyramid in Rēzekne city development**

- director of Department of Development, Rēzekne City Council;
- board chairman from "Rēzekne Special Economic zone Inc";
- director of "Parex banka Inc" sector office in Rēzekne;
- director of the State Employment Agency in Rēzekne;
- professor of economics in Rēzekne Higher Education Institution.

The questionnaire was carried out in October, 2009, and it consisted of two parts. In the first part the experts had to compare the criteria by pairs from the second level of hierarchy according to the aim – to define the priorities of human resources interests in the city development by promoting Rēzekne city development. In the second part the experts had to compare the criteria by pairs from the third level according to the criteria from the second level – to define the priorities among sectors from each group of criteria. The experts valuated the criteria in 9 points system using the scale of relative importance (Table 1).

The special vector component was calculated and priority vector component was defined after each filled in questionnaire. The calculations were done by using the following equation:

$$\begin{array}{lccc} & A_1 & A_2 & A_3 \\ A_1 & \frac{w_1}{w_1} & \frac{w_1}{w_2} & \frac{w_1}{w_3} \\ A_2 & \frac{w_2}{w_1} & \frac{w_2}{w_2} & \frac{w_2}{w_3} \\ A_3 & \frac{w_3}{w_1} & \frac{w_3}{w_2} & \frac{w_3}{w_3} \end{array} \qquad \begin{array}{l} \sqrt[3]{\frac{w_1}{w_1} \times \frac{w_1}{w_2} \times \frac{w_1}{w_3} \times} = a_1 \\ \sqrt[3]{\frac{w_2}{w_1} \times \frac{w_2}{w_2} \times \frac{w_2}{w_3} \times} = a_2 \\ \sqrt[3]{\frac{w_3}{w_1} \times \frac{w_3}{w_2} \times \frac{w_3}{w_3} \times} = a_3 \end{array} \qquad \begin{array}{l} \frac{a_1}{S} = x_1 \\ \frac{a_2}{S} = x_2 \\ \frac{a_3}{S} = x_3 \end{array} \qquad (1)$$

etc.

$$S = \sum_{i=1}^{3} a_i$$

where:

A_1, A_2, A_3 – criteria of the alternative selection;

w_1, w_2, w_3 – relative importance of chosen criteria by the respondent;

a_1, a_2, a_3 – special vector components;

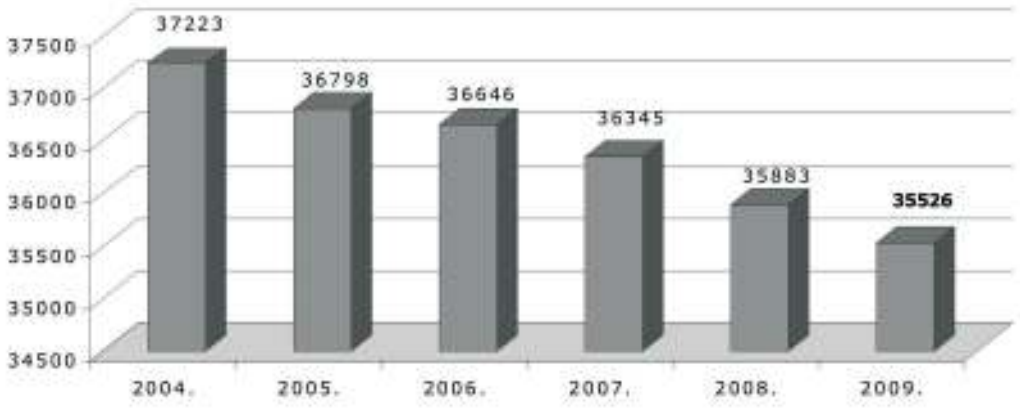
x_1, x_2, x_3 – priority vector components *(Saaty, T.L., 1980).*

Table 1

The scale of relative importance in 9 points system

Intense of a relative importance	Definition	Explanation
1	Equal importance	Equal contribution of two different activities
3	Moderate activity than the other one	Experts give a light primacy for one activity
5	Essential or great primacy	Experts give a great primacy for one activity
7	Relevant dominance	One of activities has such a great primacy that it becomes practically important
9	Very great primacy	The primacy of one activity is the clearer than the other one
2,4,6,8	Inter-units of a relative importance intensity	Is used if compromise is needed, when it is hard to choose between two intensity levels of importance

Source: Saaty, 1980



Source: Rēzeknes pašvaldības publiskais pārskats 2008.gadā

Figure 2. **Changes in the number of population in Rēzekne from 2004 to the beginning of 2009**

The sum of priority vector coordinates always must be 1. The proportion of coordination is defined to be sure about the expert's valuation precision. T. Saaty, the author of hierarchy analysis method, points out that the proportion has to be less than 10% or 0.10; though it is possible to see the proportion up to 20%. The expert has to check his/her valuation if the proportion goes out of borders. Calculating the proportion of coordination for each expert's questionnaire on the second level, it was between 0.04 and 0.17. The authors of the study may conclude that it fits into the admissible limits; it means that every expert has considered the proportion of coordination when defining the priorities of human capital interest in the city development.

At the end of the research, the employees at various scopes and areas were analysed by possibilities for Rēzekne city development by using the method of synthesis.

Results and discussion

D.Stockley, an Australian sociologist thinks that the human capital is a very important active for business or a company and it should be developed in the future (*Stockley, D., 2009).* The population ensures human resource capital in the country on the macro-economic level.

The theory of economics considers labour as one of resource types. The authors think that a definition "human resource capital" is more suitable for this economic period. Economically the definition "resources" usually means the monetary instruments and material reserves through which an entrepreneur has to produce goods or provide services (*Ekonomikas skaidrojošā vārdnīca, 2000*). However, on the macro-economic level they are the state monetary instruments and material reserves for producing goods or providing services.

A term "capital" in economics is used when it is necessary to speak about monetary instruments to produce goods and provide services. For the purpose of this research the authors presume that capital comprises human skills, knowledge, and achievements which are transformed into capital and used to produce goods or provide services.

The term "human capital" means a possibility of separate individual to generate profit for the society. Human capital may be hereditary skills, natural gifts, education, qualification etc. (*Ekonomikas skaidrojošā vārdnīca, 2000*).

The Strategy of Sustainable Development of Latvia till 2030 provides the following explanation for the human capital stating that the state human capital is the average amount of population's talents and skills, multiplied by the number of economically active people (*Latvijas ilgtspējīgas attīstības stratēģija līdz 2030. gadam).*

The authors chose the number of economically active employed people when selecting the hierarchy of criteria to define the priorities for the development of Rēzekne.

Human resources are non-material active, which economic background is based on knowledge. Therefore it is important to analyse all human resources employed in Rēzekne, where economic sectors shall primarily be developed for the improvement of socially economic situation.

One of most current problems in Latvia is rising unemployment and decreasing wages. The number of inhabitants has decreased due to the influence of crisis comparing with the previous years. The main reasons are natural population movement and migration. As it is shown in the public survey document of Rēzekne city for 2008, the number of inhabitants has decreased by 4.6%, during the time period of 2004-2009 (Figure 2).

The statistical data of the Central Statistic Bureau (CSB) indicate that the population of Rēzekne amounted to 35526 people at the beginning of 2009 and it is by 357 persons less than in the previous year. The number of inhabitants has decreased in 2008 due to the natural movement and migration. In 2008 there were 341 people born in Rēzekne, and it is by 21 babies less than in 2007. The obituary included 479 names, i.e. by 53 persons less than the previous year. Besides 4592 people have moved away from Rēzekne to other location places and 3940 people have declared themselves in the city during the period of 2004-2009. It means that the number of inhabitants has decreased by 652 people as a result of migration (*Rēzeknes pašvaldības publiskais pārskats 2008.gadā).*

It is important for Latvia not to diminish the value of human capital and to increase productivity in the situation when the number of people is getting smaller and the society is getting older. Labour productivity and productivity of human capital in Latvia is on quite low level (*Latvijas ilgtspējīgas attīstības stratēģija līdz 2030.gadam).*

According to the situation related to the employment in Rēzekne, the statistical data show that 16163 people had stable labour positions in 2007. The number of people working in manufacturing sectors (NACE – A,B,C,D,E,F) equalled to 4519 or 27.9% of all employed people, while 11644 persons of all employed people worked in service sectors (*Rēzeknes pašvaldības publiskais pārskats 2008.gadā).*

Mainly people are engaged in such servicing jobs as distribution, retailing, vehicles, motorcycles, selling of individual goods, repairing of utilitarian equipments and gadgets, transportation services, saving, communication, and education.

The unemployment rate in city was 11.8% in December, 2009 due to the liquidation or market reduction for some large companies in Rēzekne, like RSEZ "Rebir Inc", RSEZ "Verems Ltd", "Rēzeknes gaļas kombināts Ltd", "Komunāls R Ltd", and others, This rate continued to grow till April, 2009 when it reached 18.7%. At the end of the month there were 3205 unemployed persons, and the figure was by 1222 persons more than it was at the end of 2008. At the beginning of 2009 there were 50 vacancies registered in the Employment Service Rēzekne branch.

The year 2008 characterises with the necessity to increase costs for energy resources, source materials, and labour. The turnover of produced goods in Rēzekne factories in 2008 was LVL 51478 thousand (2.6% less than in 2007). The volume of export products was LVL 20338 thousand or 39.5% of total turnover. The following companies had the biggest turnover in 2008: "Rēzeknes gaļas kombināts Ltd", RSEZ "Rebir Inc", "Rēzeknes enerģija Inc", "Rēzeknes Dzirnavnieks Inc", "Larta 1 Ltd", and "Latgales druka Ltd". However, already at the beginning of 2009 the volume of produced goods sharply declined, mainly due to the market decrease experienced by RSEZ "Rebir Inc" and other factories. In Quarter 1, 2009 the recession aggravated and the volume of produced goods amounted only for LVL 6356 thousand, i.e., 38.9% less than for the same period in 2008 (*Rēzeknes pašvaldības publiskais pārskats 2008.gadā).*

The above mentioned confirms the hard socially economic situation in Rēzekne and the necessity to find solutions.

The information provided in the Informative Report on Recommendations for Economic Recovery in the Medium Term states that the halt of the economic growth can bring real threat for the decline in the quality of life for population and increase of social tension. Hence the only way to balance the budget in the medium term is to enlarge competitiveness by increasing productivity and improving manufacturing of goods with high value added. The dominating model in Latvia's economy has to be changed from labour consuming to knowledge economy (*Informatīvais ziņojums par priekšlikumiem ekonomikas atveseļošanai vidēja termiņa periodā.)*

The research authors think that the human capital is one of the main impellents of Rēzekne development.

The authors have developed the research to define the priorities promoting Rēzekne city development.

According to the questionnaire results, priority vector and medium arithmetic for the vectors were calculated for each expert (Table 2).

Table 2 indicates that officials working at local government have the most interest in

Table 2

Valuation of priority vector according to experts' questionnaires for the second level criteria group

Criteria group	Valuation of priority vector, each expert's answers					Value of medium arithmetic
	1.	*2.*	*3.*	*4.*	*5.*	
Business interests	0.242	0.205	0.489	0.076	0.212	**0.245**
Interests of local government officials	0.194	0.262	0.266	0.338	0.475	**0.307**
Interests of state government officials	0.268	0.290	0.155	0.296	0.190	**0.240**
Interests of officials working in the European Union institutions	0.141	0.044	0.021	0.241	0.050	**0.099**
Interests of those working in other spheres	0.156	0.200	0.069	0.049	0.072	**0.109**

Source: made by the authors

Table 3

The evaluation of priority vector according to experts' questionnaire results in "Business interest" criteria group in Rēzekne sectoral development

Criteria group	Minimum value	Medium arithmetic value	Maximum value
Development of mining industry	0.058	0.073	0.086
Development of manufacturing sector	0.188	0.272	0.539
Development of service sector	0.374	0.655	0.785

Source: made by the authors

Table 4

The evaluation of priority vector according to experts' questionnaire results in "Interests of local government officials" criteria group in Rēzekne sectoral development

Criteria group	Minimum value	Medium arithmetic value	Maximum value
Development of mining industry	0.067	0.132	0.178
Development of manufacturing sector	0.584	0.658	0.751
Development of service sector	0.070	0.209	0.281

Source: made by the authors

Table 5

The evaluation of priority vector according to experts' questionnaire results in "Interests of state government officials" criteria group in Rēzekne sector development

Criteria group	Minimum value	Medium arithmetic value	Maximum value
Development of mining industry	0.067	0.096	0.140
Development of manufacturing sector	0.528	0.647	0.759
Development of service sector	0.172	0.258	0.333

Source: made by the authors

the city development according to the expert valuation (0.307), the interests of entrepreneurs are in the second place (0.245), followed by the interests of officials working in state government institutions (0.240), and the fourth are interests of those working in other spheres (0.109). Those working in the European Union institutions have the least interest (0.099).

The authors agree to the evaluation of experts, since local governments having the widest possibilities to implement various projects are often most interested in the city development. The interest of entrepreneurs is also very important for the city development. Entrepreneurs have more opportunities to get wider markets in more economically developed cities. The interest of officials working in state institutions may be cautious because of financial possibilities. Citizens are less interested than officials. The authors explain the situation with unqualified labour and lack of motivation. People working in the European Union institutions have the least interest, yet the interest has been huge within the past four years.

The experts have also provided the evaluation on each group's interest in Rēzekne sectoral development. The priority vectors were calculated from the filled in matrixes by the experts. The medium arithmetic value was calculated after the minimum and maximum values were defined for each expert's evaluation. The proportion of coordination at the criteria group on the third level was 0.02-0.15 which, as the author may conclude, is within the admissible limits. It means that experts have considered the proportion of coordination when determining the interests of groups in Rēzekne sectoral development.

The results of the criteria group "Business interests" are shown in Table 3. The city entrepreneurs have the greatest interest in service sector development; here the medium arithmetic value is 0.655. The manufacturing sector development is on the second place – the medium arithmetic for this sector (0.272) is two times lower than the service sector development.

The great business interest in service sector development is based on small capital investments, yet at the same time it may provide a fast money circulation and promote the main business goal – profit earning.

The low evaluation of mining industry may be explained by its discrepancy in Rēzekne. The development of this sector is almost impossible due to the shortage of sources in the city territory.

Table 4 shows the results of criteria group "Interests of local government officials". In the experts' opinion, the local government officials should be interested in manufacturing sector development in order to improve the development of city. The medium arithmetic value for this sector is 0.658. The service sector development comes as the second one – the medium arithmetic value of this sector is 0.209.

The manufacturing sector development is more important for the city development, since it can help enhance the city budget more than other sectors; it can also promote export market and city identification.

Table 5 shows the results of criteria group "Interests of state government officials". In the experts' opinion, the state government officials should be interested mostly in manufacturing sector development. The medium arithmetic value for this sector is 0.647. The service sector development comes as the second one with the medium arithmetic value of 0.258.

The interest of state government officials in manufacturing sector development may be reasoned by more available working places for people than it is offered among service sectors. The increase of export may be the result of manufacturing sector development. It is very important in the present economic situation. The officials working in the state institutions are the ones who can promote the development of manufacturing sectors by suggesting changes to the legislation and taxation policy.

Table 6 indicates the results of criteria group "Interests of officials working in the European Union institutions". These people are more interested in service sector development. The medium arithmetic value is 0.526. The manufacturing comes as the second one with the medium arithmetic value of 0.292. The experts admit that most of the projects implemented in Rēzekne are oriented towards service sector improvement and development. There are few projects that promote manufacturing sector development.

Table 7 shows the results of criteria group "Interests of those working in other spheres". People are more interested in service sector development; the medium arithmetic value s 0.468. The manufacturing sector comes as the second one with the medium arithmetic value of 0.444, which is very close to the value of service sector development.

These figures show that people working in other spheres are interested in both manufacturing and service sector development. People are interested in finding job in service sector as well as in manufacturing sector. As the experts notice, the education and qualification of population are most suitable for jobs in the mentioned sectors.

For all groups of criteria the mining industry development was put into the third place. Its medium arithmetic value is 0.073 among entrepreneurs, it is 0.132 among local government officials, among state government officials it is 0.096, for officials working in the European Union institutions it is 0.182, and for those working in other spheres it is 0.088. The authors may conclude that the mining industry development is not a priority for Rēzekne city development in general.

The authors have calculated the global priority vector based on the mentioned results (Table 8). It offers a possibility to determine the most optimal way for splitting the capital of human resources for Rēzekne city development.

After processing the information from the inquiry forms, the authors came to conclusion that the manufacturing sector development had to be set as priority for Rēzekne city development. People

Table 6

The evaluation of priority vector according to experts' questionnaire results in "Interests of officials working at the European Union institutions" criteria group in Rēzekne sectoral development

Criteria group	Minimum value	Medium arithmetic value	Maximum value
Development of mining industry	0.066	0.182	0.258
Development of manufacturing sector	0.105	0.292	0.528
Development of service sector	0.260	0.526	0.785

Source: made by the authors

Table 7

The evaluation of priority vector according to experts' questionnaire results in "Interests of those working at other spheres" criteria group in Rēzekne sector development

Criteria group	Minimum value	Medium arithmetic value	Maximum value
Development of mining industry	0.080	0.088	0.113
Development of manufacturing sector	0.311	0.444	0.618
Development of service sector	0.297	0.468	0.609

Source: made by the authors

Table 8

Global priority vector for the priorities of human resource capital according to the medium arithmetic value in Rēzekne city development

Criteria groups	Business interests	Interests of local government officials	Interests of state government officials	Interest of officials working in the European Union institutions	Interests of those working at other spheres	Global priority vector
	0.245	0.307	0.240	0.099	0.109	
Development of mining industry	0.073	0.132	0.096	0.182	0.088	0.109
Development of manufacturing sector	0.273	0.658	0.647	0.293	0.444	0.501
Development of service sector	0.655	0.209	0.258	0.526	0.468	0.390

Source: made by the authors

working in local and state governments should be involved into the development of these sectors. The experts considered also availability of human resources in the city, when making evaluation. There are several education institutions in Rēzekne where students can acquire professions related to manufacture and servicing (vocational or higher professional education).

Suggestion that Rēzekne government has to promote the development of manufacturing and servicing sectors may be expressed according to the results. The manufacturing sector development would decrease high unemployment rate, provide regular income for population, and improve export market development.

The inquiry results processed in the research on the priorities for the city development agree to the analyses made by the Ministry of Economics on the national economy as well as the research of the Bank of Latvia on the priority sectors in Latvia.

The prior manufacturing industries defined by the Ministry of Economics that would ensure the greatest investment into the development till 2015 are the following (NACE): Food and beverage production (DA15); Wood and wooden object production (DD); Chemical substance, its products and chemical fibre

production (DG); Rubber and plastic production (DH); and Electrical and optical appliances production (DL). These sectors are the ones with most important investment into the increase of value added and export, and also with high potential of development and export. The social partners have pointed out the industries which are important for the national economy – such servicing sectors as financial mediation, tourism, and education. These sectors may improve the potential of export by improving the legislation and making the services more available to foreigners (*Informatīvais ziņojums par priekšlikumiem ekonomikas atveseļošanai vidēja termiņa periodā)*.According to the results, there are enough human resources in Rēzekne to promote the development of manufacturing and servicing sectors which positively influence socially economic situation in city in general.

Conclusions and recommendations

1. Human source capital is a non-material active which is based on the knowledge about economics. It is important for Latvia not to diminish the value of human capital and to increase productivity in the situation when the number of people decreases and the society is getting older.
2. The greatest interest in the City development is expressed in the local government; it has opportunities to implement the projects and ensure activities which diminish socially economic problems – unemployment, low-income, and enhance the city budget increase. Entrepreneurs also have more opportunities advancing their business in the developed city where wide market and qualified labour are available.
3. Entrepreneurs are interested into servicing sectors in cities, since it requires less capital investments, but can still provide faster circulation of money and stimulate gaining the main business goal – profit.
4. The development of manufacturing sector should be the priority to develop Rēzekne. The local government and officials from state institutions should be involved into the developing of these sectors. The companies working in manufacturing can earn more profit for the city budget than service companies.
5. The development of manufacturing sector would reduce the high unemployment level in the city, ensure stable income for people, and improve the development of export and city identification.
6. Rēzekne has the necessary human resources to ensure the development of manufacturing and servicing sectors which would positively influence the socially economic situation in the city. The education and qualification of city people are suitable mostly for manufacturing and servicing industries.

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Importance of Project Management Model in Organisation

Aivis Dobelis, MBA**,** Baltic Project Portfolio Manager, If P&C Insurance AS Latvijas filiāle
Lāsma Līcīte, Mg.oec., lecturer, Faculty of Economics, Latvia University of Agriculture
Aina Dobele, Dr.oec., associated professor, Faculty of Economics, Latvia University of Agriculture

Abstract. The aim of this study is to explore the importance of Project management and establishment of Project management model in a company. By researching special literature on project management and project management models the authors specify the project concept and explore evolution of project management from the Ancient times to nowadays. The authors also review different life cycle phases of project management and their characteristics.
Several project management models are described in the research with focus on extreme project management model which is as a base for model used by the company If P&C Insurance AS Latvijas filiāle called IPM (If Project Management Model). The analysis of individualised and adapted Project management model usage in a company evidences that it facilitates better financial results and gives more effective usage of resources. Successful implementation of Project management model is a prerequisite for the development of competitive capacity and long-term strategy implementation in a company.
Key words: project, Project management model, business, insurance.

Introduction

In the 21st century the business sector has faced intensification of competition. The limited availability of resources requires the business persons to seek more efficient ways and methods for using company resources. In the middle of the past century the United States and Japan developed work breakdown structure planning and efficient resource utilisation methods. Studies have revealed the benefits of work organisation, work planning, and the importance of critical resources identification. Scientific studies were carried out to discover more efficient ways for labour use as well as the knowledge and skills management in the company.

Over the past ten years there has been a business and information technology association of ideas, each of which gives the best models of joint working efficiency. Project management models were initially implemented in business management, later developed by information technologies in the field of software development, but now they are merged for better company's development. Project management is a base line for business activities and it is often used not only for creative research processes, but also in the business field. Each company has at least one specialist who is responsible for idea generation, new project development and implementation. Project management departments usually are separate units which fit into common organisation structure and deal with complex company projects.

New level of Project development was reached at the end of the first decade of the 21st century. Currently relatively innovative and perhaps even surprising ideas are becoming more and more popular like organising absolutely all company's activities base on project structure. Only the most innovation-driven companies have implemented such approach, and they are showing surprisingly good results.

In Latvia the use of Project management in various companies is on different levels. Part of the companies are using it relatively few, mainly only when enforced by the legislative requirements. Other companies use Project management only for large projects development, but in every day work they rely on their employees' individual abilities. However, the proportion of businesses which are highly focused on projects is quite significant. Despite the current economic situation in Latvia, these companies are showing robust growth and positive operating performance.

The company If P&C Insurance AS Latvijas filiāle as one of project-oriented business enterprises of Latvia is chosen as an **object** of this research.

Based on previous findings the following research **hypothesis** was set – the presence of individualised project management model in a company is a prerequisite for the achievement of better business objectives and rapid development of company.

The **aim** of this research is to explore and evaluate the importance of Project management and adapted Project management model in company. The following **tasks** are defined to achieve the set aim:

1) to analyse the essence of project management and its standards;
2) to identify project management models;
3) to evaluate development and establishment of project management model in a company.

The monographic descriptive method, the method of analysis and synthesis and statistical research methods were used for the purpose of the study.

Bibliography of this paper includes scientific publications of Project management, standards of Project models, scientific literature on guidelines of Project management in business area, Internet materials, and internal documentation from company If P&C Insurance AS Latvijas filiāle.

Discussions and results

1. Main aspects and development of Project management

Project management is known since the beginning of civilisation – construction of Egypt pyramids, or military operation planning. In the 1950s business organisations realised that the competitiveness and promoting development requires the systematic management of projects using appropriate tools and techniques. In the middle of the past century project management has been separated as a distinct science (David I. et al., 2006).

The founders of project management are Henry Gantt who is called as a creator of the planning and control technology (M. Stevens, 2002), and Henri Fayol, who was known as a creator of five management basic postulates (planning, organisation, management, coordination, and control), which are the basis for project and programme management science up to nowadays (M. Witzel, 2003). Both – Henry Gantt and Henri Fayol – were followers of Frederick Winslow Taylor. Taylor is known as a pioneer of modern project management, and the development of methods for resource planning and work breakdown structures was among his best-known works.

At the end of the past century projects already played an important role in the company's work formation and development. In the first decade of this century this trend continues and Project management evolves and moves towards the information technology field called Object-Oriented Development. It means that business activities consist solely of individual project implementations. It is therefore very important for companies to reorient their activities in early stages to the project development model because it will bring advantages in competition with other companies in work efficiency and cost-cutting.

Companies should carefully define projects to avoid mistakes occurring when improvement of the daily activities can be identified wrongly as a purpose for a launch of project. The Project is a set of coordinated activities of identified group of people to achieve certain objectives. It can be said that the project is a tool for more efficient use of resources, and faster, higher quality and controlled outcome. It has defined beginning and end date and also a range of technical and economic criteria and indicators. The project may vary from a few days or weeks to be long-term and last for many years. Specific project management system is created and used in complex projects. Separate project management organisation can be established to support complex projects; thus tending to operate only until the end of project.

Key project features include:

- the project has a temporary organisation. It means that the group of people who are participating in project is working full time or part-time and is set up to implement the project, and this group does not exist as a team after project is implemented;
- project is a unique event; it does not have pro-cyclical structure. It is carried out only once;
- the project shall have well-defined project objectives;
- the project has a defined budget: the resources and time constraints. Project must have an approved set of criteria that determine the resources (money, people, equipment, etc.), estimates and overall project execution time.

The task can be defined as a Project if all the above listed conditions are fulfilled.

The project development process consists of four main life cycle phases – initialisation of the project, project analysis, project implementation, and project closure. Each of them has a different amount of project activities. Necessary resources – financial and human resources, certain knowledge and techniques – are needed to successfully implement the project and coordinate it.

2. Project management models

Project management model is a set of methods, documentation, examples, templates, and tools, which serves as the standard for project implementation (HD Litke, 2003). At the beginning different business models were used for project management. But specific project management models and their groups were created during the time and evaluation of information management science:

- traditional sequential model;
- critical path model;
- spiral model;
- extreme project model (XPM);
- structured approach model (PRINCE2).

Usage of any of those models on general level does not give the maximum benefit, so the company needs to choose some of the general models and use them as a basis for development of individualised project management model.

In the first years of existence of the company "If", some projects were implemented in order to develop a formula calculation of insurance premiums. Project of policies printouts was initialised in 2000. However, these projects are more focused on creation of the company's business environment, rather than competitiveness and development.

Since 2005, If Insurance step by step has introduced a Project Management model, called IPM (If Project Management Model). Extreme Project Management Model PROPS serves as a basis for the IPM model. This project management model is focused on human factors - strong project managers and leaders (Rumpe B. et al., 2003). Its basic idea lies in control of human resources, rather than formal management through strict set of guidelines and phase sequence (Whitty, S.J., etc., 2007).

Extreme project management model PROPS is distinguished with allocation of work tasks and their cyclical performance, step by step towards the goal.

The following activities need to be performed:

- to develop an implementation plan (identify all tasks necessary for the performance of each task, give a small description of each task, and add the expected development time);

Source: made by the authors

Figure 1. **Scheme of Extreme project management model**

Table 1

Financial performance of If Insurance for the period of 2006-2008 and forecast for the period of 2009-2011

Insurance Portfolio	2006	2007	2008	2009*	2010*	2011*
Gross written premiums, LVL	9 180 873	11 846 018	15 451 672	15 458 726	15 506 183	15 595 003
Net earned premiums, LVL	6 350 554	8 838 507	11 570 547	11 577 466	11 624 923	11 713 743
Chain increase rate, % - $t_{m(ch)}$	-	*+39.2*	*+30.9*	*+0.1*	*+0.4*	*+0.8*
Net consideration paid, LVL	2 674 143	4 031 423	6 101 632	6 084 808	6 047 584	5 988 980
Chain increase rate, % - $t_{m(ch)}$	-	*+50.7*	*+51.4*	*-0.2*	*-0.7*	*-1.0*
Expense Ratio	0.42	0.37	0.38	0.38	0.37	0.37
Loss Ratio	0.56	0.57	0.61	0.60	0.60	0.59
Combined Ratio	0.98	0.93	0.98	0.98	0.97	0.96

* Forecasts based financial results of the calculations for 2008

Source: authors' calculations

- to develop a weekly plan based on the overall implementation plan;
- to use daily tasks to support a weekly plan.

Implementation Plan (Release plan) describes all the works that will be undertaken in the project. It is prepared by project manager and before starting Project activities should be aligned to the project team.

One of the basic rules is: none of the tasks should be longer than 3 days. If there is such occasion, one should try to spread it. Expected duration should be indicated in hours. Task description should not explain how to carry out the task, but what is the expected result of it. Project result is derived at the end of the project combining the results of each task (Figure 1):

Without a project management presence in company's activities each of them is more intuitive than knowledge or methods-based. The use of projects reduces risks, and the development of organisation culture positively impacts motivation and work efficiency of the company's employees.

3. Importance and usage evaluation of Project management model in a company

Project development is a base for If Insurance growth. Project implementation on schedule and on amount of planned resources within the prescribed quality is a way how to achieve business objectives and integrate long-term strategy. By giving appropriate tools and trainings to employees it is possible not only to maintain the company's operations in the declining economic and strong competition environment, but even to achieve the company's growth and development.

At the end of 2005 and early 2006 If Insurance introduced project management-oriented business organisation and set the strategic goal – to grow rapidly and profitably, while maintaining the leading position in the work efficiency. By analysing the financial performance of insurance from 2006 to 2008 the authors conclude that the goal is reached. The chain growth in net earned premium by product was 39.2% in 2007 and 30.9% in 2008 on average. The authors projected that changes on customer

acquisition costs, gross written premiums and net claims are made in the calculations showed from 2009 to 2011, hence projecting changes in insurance profitability if other items of revenue and expenditure remain unchanged (Table 1).

Despite the economic downturn in 2009 the company still plans to increase net written premiums and to decrease the amount of payment on Claims. Such indicators certainly could not be achieved without the presence of high quality and appropriate project model.

By analysing financial and human report data of Insurance If project portfolio, it can be concluded that after the introduction of Project Management model If Insurance has successfully implemented several large-budget projects. Without the usage of Project management model these projects would probably have failed, or the costs and development time would be considerably higher. As examples the following projects can be pointed out: first authorised insurance self-service environment on the Internet "If Portal" (developed in 2007, budget: EUR 35 000, duration: 6 months, project team: 20 people), Health Insurance programme (year: 2008, budget: EUR 200 000, duration: 2 years, project team: 35 people), External reporting system for partners "Web point" (year: 2009, budget: EUR 12 000, development time: 3 months, project team: 7 people). This proves that the company is able to implement complex projects with internal resources.

Since 2009, IPM project management model is introduced on the Baltic level project organisation. Common Baltic system implementation project (estimated implementation phase till 2012, budget: EUR 480 000, development time: 2.5 years, project team: 20 people) is the first of such projects. The project was launched in June 2009. After five months of project the activities deviation by time axis against the plan shows the benefit of 0.012%, while the financial offset by overspending equals to 0.006%. These results would not be achieved without the proper tools, techniques, and knowledgeable project managers.

To assess the efficiency of resource usage, CASCO Project development results were compared before (until 2004) and after the introduction of IPM (Table 2).

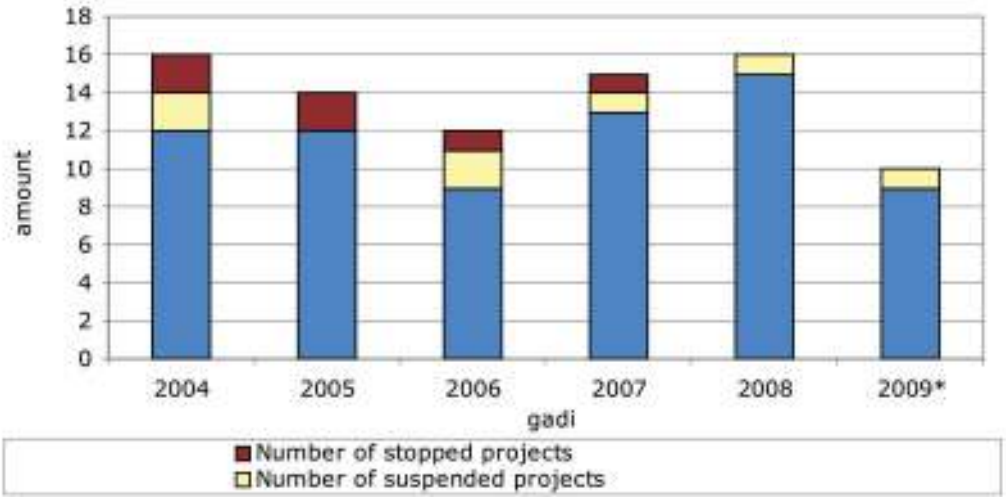
Table 2 shows that Project management model gave opportunity to reduce the project development team and significantly (3.6 times) reduce the development time needed for development. CASCO

Table 2

Comparison of CASCO project development resources between 1998 and 2008

Indicators	1998	2002	2005	2008
Scheduled development time, months	5	7	6	6
Costs of Project, thou. EUR	10	12	15	12
Real development time, months	9	9	6	3
Project development team	12	10	8	7
Time utilisation	**1.8**	1.29	1	**0.5**
Average project complexity factor	**0.62**	0.94	1.14	**1.38**

Source: authors' calculations according to If Insurance project portfolio data, 2009



Source: made by the authors

Figure 2. **Dynamics of project status during the period of 2004-2009**

project implemented in 1998 is compared with the results of 2008. Of course, some impact is evidenced from the experience and knowledge to be learned from previous projects.

Experience and skills allow working on projects with much bigger complexity. Project complexity factor can be calculated from certain parameters of analysis, which include the number of departments involved in the project, user targeting parameters, the return on project finance and others.

Also the funding of the Project was substantially increased – in 2009 it was 2 million (Figure 2) and it has grown 1.3 times compared with 2004. Also the amount of financials is increased in each project. In 2004, an average project financing was EUR 93.8 thousand, but in 2008 it has reached EUR 137.5 thousand. In 2009 the project amount is reduced compared with 2008 due to the fact that there are more expensive and complex projects as the funding per project has increased. Project management model gives a positive impact on the amount of projects being successfully implemented. In 2009 the proportion of successfully implemented projects is 90%, while in 2004 it was only 75%.

The number of successfully implemented projects is an important indicator. If 75% of all projects were successfully carried out in 2004, then in 2008 the number reached 93%, and in 2009 ninety per cent of projects were concluded successfully. For company it is important to identify the projects whose implementation could be a problem as soon as possible. Due to the changing market situation the projects initiated under the proper conditions may not yield the necessary business, so they are temporarily suspended. If conditions of business environment change, these projects may be resumed, so the company has stopped the projects not because it has considered them as unsuccessful.

Staff turnover, depending on an employee participation in the project team or not is analysed as the next indicator (Table 3).

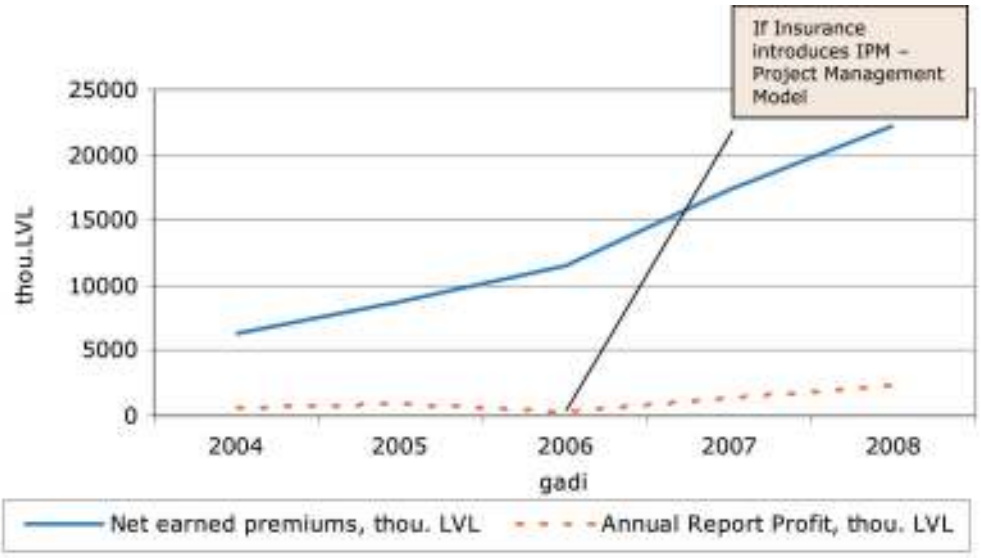
Between 1999 and 2008 the number of company's employees has increased 3.2 times, while the project team has increased 10 times. It means that the company is changing its work organisation by orientation on the project structure. The share of employees from the

Table 3

If Insurance staff turnover between 1999 and 2008

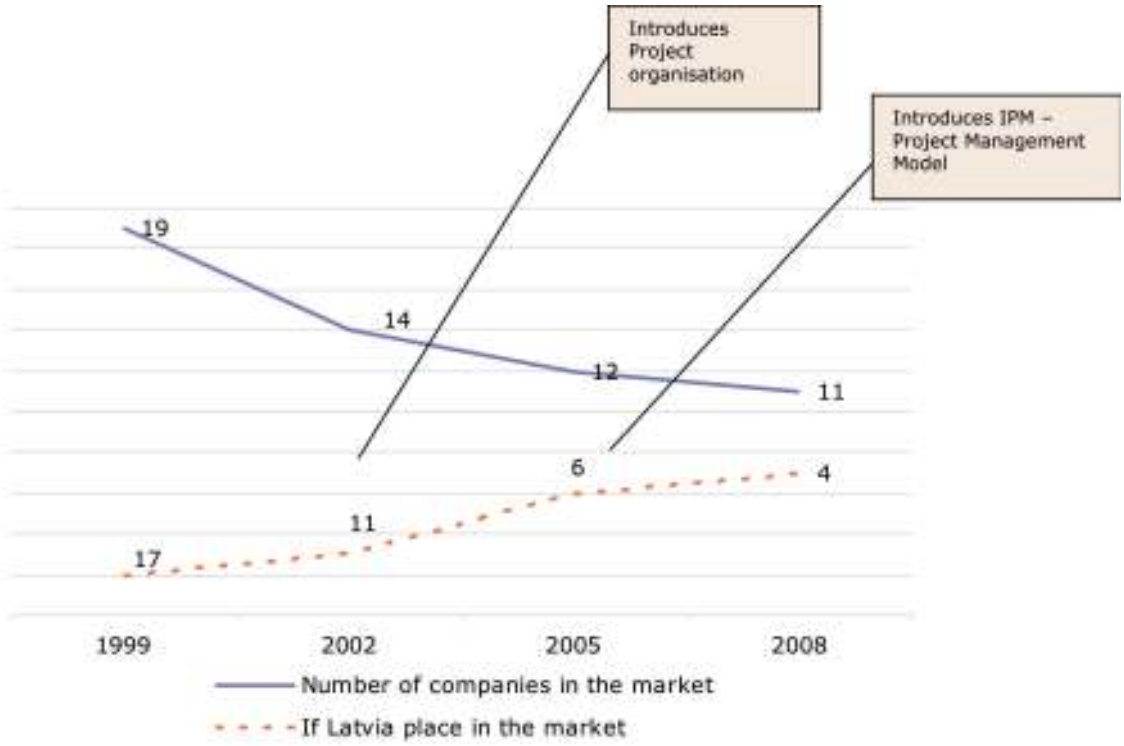
Indicators	1999	2002	2005	2008
Total number of employees	35	85	135	115
Staff turnover in the company, %	10	15	**25**	**20**
Project team	2	2	8	20
Turnover of project team, %	0	50	**25**	**16**
Proportion of employees from project team, %	6	2	6	17

Source: authors' calculations according to If Insurance project portfolio data, 2009



Source: made by the authors

Figure 3. **Dynamics of If Insurance accounting figures between 2004 and 2008**



Source: made by the authors

Figure 4. **If Insurance market place in the insurance market of Latvia between 1999 and 2008**

project team in 2008 compared with 1999 has increased 2.8 times. Staff turnover is significantly smaller in the project team staff comparing with employees who are not participating in Project development. These employees are more motivated, accountable, and they see opportunities in the company, so they are much more loyal to the company as well. The company is more interested in those workers because of their knowledge and skills.

Successful implementation of project management model may affect the company's financial performance. The analysis of data placed on Figure 3 shows that the project management model IPM disposed by the company If Insurance has improved the net earned premium from 2006, when it was introduced for the use. The company's profits were also increased during that period. The project management model promoted by the company has introduced company's service availability and customer growth.

The correctness of the Company's decision to implement a project management model as a capacity – building tool for competition in Figure 4 shows that the project management establishment in the company has contributed to its rapid development over other non-life insurance companies in the insurance market in Latvia. If Insurance in 2009 is gaining the 4th place in the net written premiums and comparing with competitors continue to show positive trends.

The coming years will show that the development of any company is based on project development. Also daily work will be built on the allocation to projects. Implementation of the project provides much higher level of returns and better motivates employees, since it clearly sets out the resources, aims, and methods for achieving the goal.

Conclusions and proposals

1. It is necessary to explore new development paths, ways, and methods due to competition in business. The company's competitiveness and promoting development show the necessity to implement an organisation of project management. More and more project management models are used by the company to achieve competitive long-term development goals.
2. There are various types of project management models. Small and medium-size businesses should use general project management models to develop small projects. Large companies have the opportunity to invest sufficient resources for project management model individualisation. Such model applied in the company is much more efficient than general.
3. Consequently, a project management model first introduced in 2006 has being as prerequisite for the growth of If Insurance net written premiums and annual profit due to better service accessible to customers.

4. Usage of project management model in the company If Insurance allowed 3.6 times faster and with 1.7 times fewer human resources to implement projects equivalent of complexity and scale compared with 1998, when project management model was implemented and in 2008 when this model was already fully implemented in the company.
5. Successful project implementation is a precondition for business development and strategic marketing objectives. It is the basis for the fact that despite the escalating competition when competitors leaving the insurance market in Latvia and tight economic situation over the past 2 years, If Insurance continues to show the growth and ever reaches better place in comparison of gross premium volume between the non-life insurers in Latvia in 2009 adopting the 4th place among 11 non-life insurance companies.

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Effect of Macroeconomic Variables on Unemployment Rate in Poland

Aldona Zawojska, Dr. oec
Department of Economics and Economic Policy, Adiunkt, Warsaw University of Life Sciences

Abstract. Even though the paper focuses on overall unemployment in Poland, it highlights the agriculture connections with the national economy and particularly with labour market that might govern individual choices between employment in the farm and non-farm sectors. The research aims firstly to complement the literature on unemployment in Poland, and secondly to examine the relationship between macroeconomic indicators and unemployment rate. The paper consists of two major parts. The first part presents an overview of the relevant literature concerning the above mentioned relations. The next part, based on the data available from the Central Statistical Office of Poland, National Bank of Poland and the Ministry Finance of Poland, offers the results of author's empirical study. Correlation analysis and simple linear models were applied to explain the relationship of unemployment rate with individual macroeconomic indicators (explanatory variables).
The results show that during the years included in this study (2002-2008) the unemployment rate in Poland was statistically significant and negatively impacted by the economic growth, Gross Domestic Product per capita, exports and imports, foreign direct investments, final consumption expenditures, gross capital formation, and central government expenditures. At the same time, the real interest rates of the central bank were positively related to the unemployment rate. Assuming that the evolution of real interest rates in Poland was mainly due to the monetary policy changes, it is possible to reach the conclusion that restrictive monetary policy has negatively affected unemployment rate; although with a time-lag effect. No statistically significant linear relationship between the current and past unemployment rates in Poland; thus suggesting a lack of hysteresis effect.
Key words: agriculture linkages, unemployment rate, Poland, macroeconomic indicators.

Introduction

Both the employment and contribution of agriculture to the GDP had a tendency to decline dramatically in the developed countries. On the contrary, structural changes in agriculture and increasing globalisation of the world economy have created strong linkages between agricultural sector and overall domestic and foreign economies. It is due to higher capital intensity, greater reliance on credit, purchased inputs and technological innovation as well as higher importance of off farm work for farm household incomes. Increased integration of agriculture with other sectors of domestic and international economies denotes that changes in the national economy have major impacts on agriculture. For example, the growth of non-agricultural sectors exercises its impact on the demand for agricultural products. However, since agriculture is not the only economic driver of the rural economy, those changes influence as well a rural community as a whole.

In Poland, agriculture still remains big employer with contribution to the total employment at 13% in 2008. Transformation process requires the decline in the share of agriculture workforce in favour of other sectors. Additionally, as much as 38% of economically active population live in rural areas. Therefore, the country's overall labour market situation (ex. employment performance, unemployment level) seems to be very important for labour adjustments in agriculture and for off-farm labour mobility of rural households which would reduce urban-rural economic development disparity.

The paper's focus on the unemployment in Polish economy as a whole highlights the labour market connections that might govern individual choices between employment in the farm and non-farm sectors. By examining the macroeconomic determinants of unemployment rate in Poland, the research reveals indirect channels by which those choices can be influenced.

The experience of persistent mass unemployment in many European countries has attracted a great deal of attention from economists and policy makers as this phenomenon represents the evidence of both market and government failures, and it has caused huge social problems in recent years. Moreover, high unemployment confirms doubts about the process of European integration and cohesion.

The amount of economic literature analysing this problem and looking at it from different perspectives has been absolutely enormous (for example, Giugni M., 2009; Gangji A. and Plasman R., 2007; Arendt L., 2006; Ukrainski K. and Eamets R., 2004; Andersen T. and Rasmussen B., 1999).

This study attempts to offer some new interpretations of the unemployment in Poland, in particular of the relationship between unemployment rate and major national macroeconomic variables and, consequently, to contribute to the labour market literature.

The research aim is to investigate a relationship between the unemployment rate and major macroeconomic variables in Poland during the period of 2000-2008. Moreover, the study tried to test an

"unemployment hysteresis"[1] effect in the period under investigation.

The research tasks are as follows: 1) to review the literature concerning macroeconomic determinants of unemployment; 2) to verify the existence of high interrelationship between unemployment and the national economy performance. In particular, the research wants to examine whether such macroeconomic variables as Gross Domestic Product, inflation, interest rates, exports and imports, foreign investments, domestic demand (aggregate consumption and accumulation), exchange rate, real wages, and public expenditures have impact on the unemployment rate in Poland.

The data used in the study include the levels of different macroeconomic variables as well as the rates of change. Unemployment data, including BAEL data, prices, wages, national accounts statistics (Gross Domestic Product, final consumption expenditure, gross capital formation) and balance of payments data were drawn from the Central Statistical Office of Poland. Other sources of data were as follows: National Bank of Poland (exchange rates, interest rates) and the Ministry of Finance of Poland (state budget expenditure). Simple linear regressions of unemployment rates were estimated on a variety of explanatory variables. Interrelations between current and delayed (time-lagged) variables were also examined in the research.

Theoretical framework

Historically, economists have always been concerned by the efficiency in the use of resources, including labour resources. Inefficient use of the resources means not using or wasting them, therefore labour unemployment is seen as an economic problem. The relationship between the unemployment and other macroeconomic indicators (wages, inflation, aggregate demand etc.) has been the subject of extensive research in theoretical and empirical macroeconomics.

The neoclassical economists held the view that inflation does not influence the unemployment level. Phillips, in his milestone paper on the relation between unemployment and the rate of changes in the money wage rates, showed that there was a consistent and inverse relationship between the two variables in the data sample period he considered (Phillips A., 1958). His finding was a negation of the neoclassical theory of employment and inflation.

In 1968, two economists M. Friedman (1968), a monetarist, and E. Phelps (1968), a new Keynesian, contested the prevailing consensus on unemployment. They independently denied the existence of a permanent (long-run) trade-off between inflation and unemployment. They said it was wrong to suppose, as most economists had up to then, that governments could reduce the rate of unemployment if only they would tolerate a little more inflation. According to Friedman, professional controversy about the relation between inflation and unemployment has been intertwined with controversy about the relative role of monetary, fiscal, and other factors in influencing aggregate demand (Friedman M., 1976).

Analysing unemployment determinants, the impact of wage changes on unemployment is a crucial issue. For example, the classic solution for unemployment is a reduction in real wages. The labour market is defined by the wage curve, according to which real wage and unemployment are negatively related. The empirical estimates reported by D. Blanchflower and A. Oswald (1995) indicate that the elasticity of real wages related to the level of unemployment equals to - 0.1.

The economists dispute about the relationship between unemployment rate and the rise of real production. The relationship between output (GDP) and unemployment is shown, for example, in the law of Okun (Okun A., 1962) indirectly stressing that fall in the output is accompanied by a rise in unemployment rate. However, some authors (Holloway T., 1989) have suggested the breakdown of this law. Conversely, according to Solow-Ramsey growth model (Barro R. and Sala-i-Martin X., 2003), a remedy for unemployment is the economic growth. W. Coleman (1997) demonstrates that growth in real GDP alone will be sufficient to eventually eliminate any quantity of unemployment, as long as the minimum wage is not set too high.

The majority of economists, especially the demand-side economists, believe that changes in the components of effective aggregate demand for goods (consumption, investments, government spending, and exports) influence the unemployment rate fluctuations. The view that employment is impacted by the level of aggregate demand has been a major part of J.M. Keynes' contribution (Keynes J., 1936) to the economic theory and policy. According to Phelps and Friedman, for example, the long-run rate of unemployment cannot be influenced by monetary or fiscal policy affecting aggregate demand.

Empirical studies have found support for an inverse relationship between aggregate demand and unemployment.

The effects of capital accumulation on the labour market were discussed by M. Karanassou and others (2007) who concluded that capital stock was a major determinant of unemployment in the Nordic countries. Results obtained by M. Karanassou and H. Sala (2008) showed that the acceleration in capital accumulation was the decisive driving force of Australian's unemployment in the 1990s and the 2000s, however the main determinants of the unemployment growth in the 1970s and early 1980s were wage-push factors and the increase in interest rates. Results obtained by W. Coleman (1997) suggest that the elimination of even a moderate quantity of unemployment by the process of capital accumulation may take long time (more than two decades).

H. Feldmann (2009), using data from 58 countries for the period of 1980-2003, studied

[1] The idea of *hysteresis* in the unemployment rate states that an increase in unemployment may turn out to be (partially) irreversible, as a result of workers' loss of skill and morale (Phelps E., 1972)

Table 1

Definition of variables used in the models

Symbols	Definition
	1. Independent variables (x)
GDPg	Annual growth rate in real GDP (nominal GDP adjusted by GDP deflator) [%]
GDPpc	Gross Domestic Product per capita [PLN]
CPIg	Inflation rate as increase in yearly price indices of consumer goods and services [%]
IRl	Lombard rate of the central bank of Poland in real terms (deflated by CPI) [%]
IRrd	Rediscount rate of the central bank of Poland in real terms (deflated by CPI) [%]
IRd	Deposit rate of the central bank of Poland in real terms (deflated by CPI) [%]
IRrf	Central bank reference rate (minimum money market intervention rate) in real terms [%]
EX	Exports of goods and services [USD million]
IM	Imports of goods and services [USD million]
FDI	Annual inflow of foreign direct investments into Poland [EUR million]
FCEg	Annual growth rate in final consumption expenditure in real terms [%]
GCFg	Annual growth rate in gross capital formation in real terms [%]
ER	Average annual nominal exchange rate of Polish zloty EUR/PLN
RWg	Average annual increase in real average gross wages in the national economy [%]
GEXP	Expenditures of the central government (state budget) in real terms [PLN million]
	2. Dependent variable (y)
UR	Unemployment rate (registered unemployment) as of December of each year [%]

Source: Author's own research

how the size of government affects unemployment in developing countries. According to the results of his regression analysis, a large government sector is likely to increase unemployment. A large share of government consumption in total consumption appeared to have a harmful effect on unemployment. However, he did not find evidence that a large share of public investment in total investment affected unemployment, neither for bad nor for good.

World demand impact on domestic (British and American) unemployment was studied by J. Alt (1985) who found that there was a significant negative effect from the rest of the world onto British unemployment after a short delay (1-3 months) and positive effect of the word demand on the US unemployment but after a longer delay.

The close correspondence that exists between the real interest rate and unemployment was pointed out by E. Phelps and G. Zoega (1998); J. Fuhrer and G. Moore (1995), and P. Isard et al. (1999). As said by Phelps (1994), a growing real rate of interest depresses the creation of new jobs and the demand for new products as it affects hiring costs, costs of investment in job-specific capital, and the costs of creating stable customer markets.

The rate of unemployment can also be affected by national currency fluctuations, as its movements affect the growth of demand (net exports, foreign investments inflow etc.). The analysis points out that the impact of wage formation on unemployment depends crucially on the exchange-rate regime in force.

Empirical procedure

In the research, deductive reasoning strategy was applied, i.e. the relevant literature was first studied then reality was observed ("from theory to empirics" approach).

Simple linear models were applied to explain the unemployment rate (dependent variable) as function of individual macroeconomic variables (explanatory variables), i.e.:

$$Y_t = \beta_0 + \beta_1 X(z)_t + \varepsilon_t, \quad (1)$$

where:

Y_t – the unemployment rate in the year *t*;

$X(z)_t$ – explanatory variable in the year *t*;

β_0, β_1 – are regression parameters;

ε_t – is random error.

Equation with variable time delay is given by:

$$Y_t = \beta_0 + \beta_1 X(z)_{t-i} + \varepsilon_{t-i}, \quad (2)$$

where:

Y_t – the unemployment rate in the year *t*;

$X(z)_{t-i}$ – explanatory variable in the year (*t-i)*;

β_0, β_1 – are regression parameters;

ε_{t-i} – is random error;

$i = \{1,2\}$.

Standard ordinary least square (OLS) method was used to find the best estimates of β_0 and β_1. Student's t tests were applied to verify if the coefficient of regression β_1 and the intercept β_0 estimates differed from zero (or are significant). Goodness of fit of the models was measured using the Shapiro-Wilk test (for testing the normality of errors) and the Durbin-Watson test (for testing for possible autocorrelation in the residuals from the regression analysis) (Borkowski B. et al. 2003; Witkowska D., 2006). The Goldfeld-Quandt test (Goldfeld and Quandt, 1965) was employed to test the presence of homoskedasticity (constant variance) of residuals from the estimated equations.

Table 1 presents a set of variables for the period of 2000-2008 used in estimation of the models together with the definitions of those variables.

The study has used yearly observations for the period of nine years of data, i.e. from 2000 to 2008. Regressions without lag time, with negative lag time of one year, and with negative lag time of two years were calculated for the research purpose. It means that the number of years the independent variables were shifted backward in time was 1 and 2 respectively.

Research results

Correlation between the unemployment rate and macroeconomic variables

Table 2 shows correlation coefficients between the unemployment rate in Poland and selected macroeconomic variables having potential impact on this rate.

Apparently close, statistically significant (p=0.05) and negative correlation is seen between the unemployment rate for any particular year and the same years' levels of: GDP per capita, central bank deposit interest rate, value of exports, imports and foreign direct investments inflow as well as changes in final consumption expenditures in the economy. Correspondingly, the unemployment rate was positively correlated with the interest rate at which

Table 2

Pearson correlation coefficients between the unemployment rate (UR) and selected explanatory variables (x)

Independent variables	*Correlation coefficients between:*		
	value of UR_t and value of x_t	value of UR_t and value of x for the previous observation (x_{t-1})	value of UR_t and value of x for two observations ago (x_{t-2})
UR	1.000	0.492	0.439
GDPg	-0.542	-0.666	-0.794*
GDPpc	-0.670*	-0.824*	-0.893*
CPIg	-0.158	0.228	0.508
IRl	0.315	0.590	0.781*
IRrd	0.340	0.610	0.781*
IRd	0.783*	0.824*	0.602
IRrf	0.390	0.620	0.779*
EX	-0.741*	-0.873*	-0.920*
IM	-0.759*	-0.873*	-0.926*
FDI	-0.709*	-0.715*	-0.722
FCEg	-0.787*	-0.469	-0.887*
GCFg	-0.362	-0.673	-0.843*
ER	0.617	0.183	-0.380
RWg	-0.613	-0.600	-0.297
GEXP	-0.613	-0.736*	-0.799*

Note: * Significant at 0.05 level
Source: author's research

Table 3

Estimation results for the unemployment rate (y) regression models

Independent variable x	Estimates of parameter β_0	Estimates of parameter β_1	Coefficient of determination R^2	Adjusted coefficient of determination AR^2	Autocorrelation of the random component ρ	Durbin-Watson-statistics d
$GDPg_{(t-2)}$	22.79	-1.83	0.63	0.56	-0.457	2.579
GDPpc	28.54	-0.00051	0.45	0.37	*1.655*[1]	*0.710*[1]
$GDPpc_{(t-1)}$	34.41	-0.00078	0.68	0.63	-0.933	1.782
$GDPpc_{(t-2)}$	40.98	-0.00112	0.80	0.76	-1.273	1.060
IRd	12.20	2.73	0.61	0.55	-0.389	1.706
$IRd_{(t-1)}$	8.35	4.32	0.68	0.62	-1.401	2.061
$IRrd_{(t-2)}$	9.62	1.18	0.61	0.53	-0.860	1.905
$IRrf_{(t-2)}$	8.55	1.68	0.61	0.53	-0.986	1.865
$IRl_{(t-2)}$	8.50	1.13	0.61	0.53	-0.768	1.992
EX	20.82	-5.7E-05	0.55	0.48	0.041	1.631
$EX_{(t-1)}$	22.71	-9.1E-05	0.76	0.72	-1.225	1.372
$EX_{(t-2)}$	24.29	-0.00013	0.85	0.82	-1.206	0.865
IM	21.31	-5.2E-05	0.58	0.52	-0.041	2.285
$IM_{(t-1)}$	23.66	-8.5E-05	0.76	0.72	-1.158	1.353
$IM_{(t-2)}$	26.42	-0.00014	0.86	0.83	-1.116	0.988
FDI	21.84	-0.0006	0.50	0.43	-0.960	2.010
$FDI_{(t-1)}$	21.92	-0.0006	0.51	0.43	-1.417	1.217
FCFg	24.64	-2.29	0.62	0.56	0.619	1.435
$FCEg_{(t-2)}$	27.99	-3.63	0.79	0.74	0.846	1.393
$GCFg_{(t-2)}$	16.92	-0.34	0.71	0.65	-0.452	2.516
$GEXP_{(t-1)}$	33.30	-9E-05	0.54	0.47	-0.190	2.201
$GEXP_{(t-2)}$	39.89	-0.00013	0.64	0.57	-0.678	1.706

Notes: [1] Durbin-Watson-statistics d in this case is smaller than lower critical value (p=0.05) meaning that residuals are correlated; non-linear relationship exists.
Source: author's research

banks deposit their surplus money at the central bank.

There was even strongest negative correlation between the unemployment rate and lagged GDP per capita, exports and imports. Statistically significant negative correlation occurred for the unemployment rate and such lagged variables as state budget expenditures (the strongest at a lag of two years than at a lag of one year) and GDP growth rate (at a lag of two years). Positive relation was found between the unemployment rate and two years' lagged lending rates of the central bank (reference rate, lombard rate, and rediscount rate).

The relationship between the unemployment rate and inflation rate was found not to be statistically significant, although theory (ex. the Phillips curve) suggests short-run inverse correlation between the two. The research results might suggest the non-accelerating inflation rate of unemployment (NAIRU) in Poland. There was not statistical significant linear correlation between the current unemployment rates and previous (lagged) unemployment rates, suggesting the lack of evidence on hysteresis effect.

Regression results

The correlation based approach allowed for the selection of 22 simple linear regression models being then tested in the study. Table 3 reports the regression results. All the models, except for the unemployment rate regressed upon GDP per capita (*GDPpc*) are well fitted.

The most important in explaining the variation of unemployment rate (relatively large value of the determination coefficient R^2) there were two-years' lagged variables: imports, exports, GDP per capita, and rate of change in the final consumption ($R^2 > 78\%$).

Results of the Shapiro-Wilk test on residuals do not allow rejecting the normality assumption in the majority of models apart from the unemployment rate regression upon imports (*IM*), rate of real GDP growth with a time lag of two years ($GDPg_{(t-2)}$), and one year lagged GDP per capita ($GDPpc_{(t-1)}$).

Godfeldt-Quandt test led to the conclusion that heteroscedasticity (not constant residuals variance) was present for variables *FDI, EX* $_{(t-2)}$, and $IM_{(t-2)}$.

According to the regressions' estimates, all of the β_1 coefficients are negative (excluding interest

rates) indicating that they are inversely related to the unemployment rate in Poland.

Okun's law, for example, postulates an inverse relationship between movement of the real GDP and movement of the unemployment. Also a negative lag effect on the relationships between the unemployment rate and the economic growth rate was revealed in the study.

Positive coefficients β_1 of the lagged variables suggest that they have a tendency to lead the unemployment in Poland. In the study, the rate of unemployment tends to respond positively to real interest rates of the central bank.

Conclusions

1. Increased integration of agriculture with other sectors of domestic economy and with international economies denotes that changes in those economies have major impacts on agriculture and rural development. The country's overall labour market situation, especially labour oversupply (unemployment) seems to be very important both for labour adjustments in agriculture and off-farm labour mobility of rural households, equally essential for reducing urban-rural economic development disparity.
2. Generally, the relationship between the unemployment rate and macroeconomic condition is negative but not necessarily occurs at the same time. The existence of lags in the response of unemployment to economic indicators and economic policy actions should be taken into consideration.
3. The unemployment rate in Poland in the years 2000-2008 was statistically significant affected by the rate of economic growth, Gross Domestic Product per capita, exports and imports, foreign direct investments, final consumption expenditures, gross capital formation, and central government expenditures (with a negative sign) as well as by the real interest rates of the central bank (with a positive sign).
4. Assuming that the evolution of real interest rates in Poland was mainly connected with the monetary policy, it is possible to draw the conclusion that restrictive monetary policy has unfavourably affected unemployment rate and vice versa but it had a time-lag effect. The adoption of inflation targeted by the National Bank of Poland probably has an indirect impact on the unemployment-inflation trade-off.
5. No statistically significant linear relationship between the current and past unemployment rates in Poland was found; thus suggesting a lack of hysteresis effect in the sample period of 2000-2008.
6. The results indirectly suggest that promoting general economic growth and development, foreign trade and direct investments inflow as well as stimulating aggregate demand (consumption, investments and government spending) supports agricultural transformation and rural development in Poland.

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Migration Flows Management in the EU: the Case of Latvia

Inga Šīna, Dr.oec, assistant professor, BA School of Business and Finance

Abstract. International migration has become a substantial factor in transformation and development of economies in all parts of the world. Ever growing mobility of people indicates that migration is integration of national economics of countries and local communities in global economic and social network. Eventually, intensity and volume of some migration flows may decrease, whereas others may increase having significant effect on countries' labour market and economic situation in general. About 200 million people (Kazāks M., Kūle L., Strašuna L., 2007) have migrated over the recent years moving from one country or region to another seeking for a job or better living conditions. Often it is a result of political, economic, and ecological crisis.
The aim of the present publication is to analyse migration flows management in the EU and Latvia in particular, in order to develop suggestions for further improvement. The main results of the paper are as follows: the EU single policy of migration is on the development stage and it does not provide possibility to assess long-term impact of the EU legal and political instruments on the EU member states, including Latvia. Latvia has not any single coordinating mechanism of labour force migration management; one of the elements of migration flows management is stimulating the people who have left the country to return to Latvia. Thus, economic and financial incentives shall be applied to develop this idea.
Key words: migration flows, migration policy, labour force, migration flows management.

Introduction

International migration has become a substantial factor in the world's regional social transformation and development. Migration impacts countries' economies and people's living conditions. Migration flows have to be managed by legal and judicial regulation. The aim of the paper is to analyse migration flows management in the EU and Latvia in particular, in order to develop suggestions for further improvement. The author has set the following tasks to achieve the aim of the paper: to survey the theoretical base of migration flows; to analyse situation of labour force in Latvia; to evaluate the effectiveness of migration flows management in Latvia; to work out suggestions for further improvement of migration flows development. The hypothesis that Latvia has no any coordinating mechanism of labour force and it causes problems in business was defined and proved within the paper. The object of the paper is migration process in the EU and Latvia particularly. The author uses qualitative data collection method, statistical analysis, and comparison method. Theoretical part of the research covers the period from 1996 to 2009, while practical part – from 1992 to Quarter 1, 2009.

Basic cause and major leading motive of migration is voluntary movement from one territory to some other, it is opportunity of gaining certain benefits Job, better place for living, better environment availability, studies possibilities, shelter at natural disasters, refuge at hostilities, or political asylum as well as family-related and other considerations can be mentioned among others. David Held a researcher has said that international migration is like a vast, deep and growing global interdependency in all social life aspects.

Within the EU limits, about 40 million people migrate, plus illegal aliens numbering between 8 and 10 million (Hazans, M., 2009). This process can be attributed to the fact that Europe has been traditionally an attractive region which they choose to move to because of relatively high quality of life there. At the same time, labour force is required in Europe in order to retain the current level of economic growth, in the face of ageing trends of European societies, especially. It should be considered that competition among countries grows each year in the world – the USA and Canada handle problems of labour force shortage by accepting migrants from other regions; Asia with large resources of human capital grows very fast and pays ever more attention to introduction of high technologies. It is evident that labour force migration flows affect economics of both the countries left by migrants and the countries they enter.

Migration trends of labour force differ comparing the EU member states. The old EU member states are more attractive to migrants than the new ones. Consequently, the movement of people for employment purposes has a varied effect on economics of the EU member states.

Migration is movement of people resulting in changes in their distribution over an area for a certain time period as well as number and composition in each region of exchange. The multiple forms and directions of migration indicate that thorough comprehension and one frame of mind as to causes of contemporary migration process will not be reached in the offing, on the basis of a particular theoretical discipline, or focusing on a single level of analysis only (Castles S., 2000).

Theories used in the research

The author has analysed different theories about migration with the aim to understand theoretical base and then to evaluate which of them are useable for Latvia and has to be used in this period.

There are diverse theories interpreting the phenomenon of international migration (Massey, D. S., Arango J., Hugo G., 2006):

1) Neoclassical Macro Theory of Economics;
2) Neoclassical Micro Theory of Economics;
3) New Theory of Economic Migration;
4) Dual Labour Market Theory;
5) World Systems Theory;
6) Network Theory;
7) Common Causal Relationship Theory.

The author has analysed theories mentioned above and their applicability in other papers, thus the present paper provides a short description of each.

The neoclassical economic model provides a plain empiric explanation stating that volume of international migration has a direct and substantial relation to the existent difference of wage rates among the countries.

The New Theory of Economic Migration maintains that migration is a counter-action to income risks and failures on different markets (insurance, loans, labour markets) diminishing possibilities to local profit and enhancing spreading of risks.

One of the most distinct contributions of the New Theory of Economic Migration is integration among significance of decisions made by migrants, migrants' money transfers to emigration countries or regions as well as use thereof by households – these are migration aspects which have been addressed separately in literature up to now. If income risks diversification and wish to overcome local economic restrictions is the driving force of migration, then this fact should be reflected in migration outcome (for example, money transfers and use thereof).

Albeit Dual Labour Market Theory protects branched structure of employment and dual economic arrangement model in advanced industrial societies, though practice shows that it is complicated to conduct empiric investigation of segmented market structure. The Dual Labour Market Approach – based on demand – defines that international flow of labour force has started due to regular recruiting mechanisms rather than being result of individual efforts.

Though the World Systems Theory features complicate quite obscure conceptual aspect, it provides a presumption that international flows of labour force have resulted from international financial flows. According to supporters of this theory, emigrants have appeared in developing countries because of direct foreign investments and subsequent changes. Thus foreign financial flows running to peripheral regions are accompanied by relative flows of emigrants.

Also Migration Networks Theory provides a range of presumptions, for example if somebody has emigrated internationally, he or she is likely to repeat it in a length of time. Thus a possibility of new migration grows by each travel done.

The last one to mention is the Theory of Common Causal Relationship providing that sustainability of migration grows out of endeavour to provoke greater migration. Decisions on migration made by individuals and households impact social and economic structures in a community and have effect on further decisions made by other individuals and households. The Theory of Common Causal Relationship emphasises several factors important especially in feedback implementation between activity of an individual and structure of a community. The first factor is chains of migrants creating kinship and friendship bonds among migrants and non-migrants. The second factor is equality of income among households; the third factor is land division; the fourth factor is cultural environment, belief in values and way of life; and the last factor is social stamp associated with workplaces of immigrants. Land purchase is an important goal that migrants from rural area associate with monetary investments. Usually, migrants purchase land abroad because of its prestigious value or in quality of pension income source. This usage of land diminishes demand in local agricultural labour force thus enhancing emigration. The greatest emigration, the more people have access to funds required for land acquisition leading to new purchases from the part of migrants as well as more land not used in production thus making pressure for emigration stronger.

In Latvia particularly huge foreign investments in economy and the EU subsidies encouraged purchases of agricultural land for speculative reasons, tiny property tax and decade of ever growing real estate prices facilitated decrease in agricultural activity, farms were abandoned and labour force has fled the country.

Results and discussion

Along with accession to the EU, labour force emigration has become one of the topical issues in Latvia. One of the four basic freedoms of the EU single market – free movement of persons – has generated unprecedented opportunities and certain challenge in Latvia. According to the data of various researches, the number of people having left Latvia may fluctuate within 30%. The data of the Ministry of Economics indicate that labour force leaves Latvia for Ireland, Great Britain, and Germany predominantly – about 5% of the active labour force of Latvia; such situation is typical to new EU member states (Latvia and Free Movement of Labour Force, 2006). According to the data of the research "Migration of Labour Force of the Baltic States: Experience and Prospective", during four years reckoning from 2004 about 76,000 people have left Latvia for Great Britain and Ireland (Hazāns M., 2009). It is just a rough estimate as in-depth researches have not been conducted until now. Sadly, the real number of people working abroad is unknown. There is no institution in charge of gathering statistics on people who have left the country. This circumstance must be rated as especially negative, because lack of the data

is serious obstacle for analysis of the scale of the problem and impact on the society and economics. Absence of record system may entail unfavourable influence with political context since many politicians may use their own assumptions.

The present situation of Latvia's economy does not encourage people to stay here. In several polls conducted by different organisations, the majority of Latvian population expressed their wish to go abroad for job purposes. Every inhabitant here has relatives and friends working abroad. Nearly 20% of population of working age have admitted the idea of following the lead; moreover, half of those - most definitely. This circumstance fully corresponds to the presumption of the Network Theory stating that people make use of their social capital, gather information and choose to emigrate provided that their relatives or friends have been to or reside in foreign countries.

Researches of the Bank of Latvia indicate that the first wave of emigration has not come to an end yet, and forecast that in the coming decade 200,000 of economically active population will leave Latvia (Zobena, 2007). Hence the supply of labour force in Latvia would deplete, respectively. If this scenario came true, production volume would decrease significantly in long term – researches forecast 15% as compared with the situation when those people stay in Latvia (Kazāks M., Kūle L., Strašuna L., 2007). This would have a negative effect on the economic growth rates being low already.

As number of the EU member states opening their labour markets will grow in the future, and information on job opportunities abroad will become ever more available, language barriers will diminish in the society and travel costs will be reduced promoting emigration of inhabitants from Latvia.

Results of polls indicate that the most essential reasons encouraging wish of inhabitants to leave for work abroad is higher wages (84.7%), better work conditions (30.8%), and the opportunity of obtaining new experience (25.4%). These data support the fact that the main motivation of people for moving to other country for job purposes is difference in wages. One may say that the main reason is an economic factor – differences in wages, standard of living among countries, being determined by differences in the economic environment and quality of life. This cause of labour force migration meets fully the approach of the Neoclassical Economic Theory based on the presumption that migration volume is associated with difference in wage rates among countries, directly and significantly. The theory defines wage differences as the leading element motivating inhabitants for migration. In this case, the theory corresponds to the research case of Latvia at great extent.

Nevertheless, the situation of Latvia is not unique among the new EU member states. Emigration trends of Latvia are classified as moderate compared with other countries. Lithuania takes the leading position in terms of emigration volumes among the Baltic States (Indāns I., Lulle A., 2006). Official data reveal that about 320,000 people have left Lithuania for foreign countries to seek for job as soon as the country joined the EU. The key reason for emigration is social and economic condition; most popular countries to emigrate to are Great Britain, Ireland, Spain, and Germany. A different situation is in Estonia: about 20,000 inhabitants have gone abroad - to Finland predominantly - for profit-making. It should be emphasised that Estonia has made remarkable investments in the growth of labour efficiency on the basis of sustainable knowledge economics (Indāns I., Lulle A., 2006). As an example, progress in introduction of e-administration in Estonia can be mentioned as compared with Latvia. Estonia has been using e-signatures to optimise state administration, e-taxes, and electronic election of Estonian local governments. The parliament of Estonia has been implementing e-administration for several years. Latvia is behind as to the introduction of e-administration in comparison with growth of Estonia in this area.

Assessing demographic situation of Latvia, one should say that demographic trends are not optimistic. Despite the growth of birth-rate of late years, depopulation of inhabitants continues in Latvia. As suggested by the data of EUROSTAT, the second most rapid decrease in the number of inhabitants among the EU countries is expected in Latvia. Death rate still exceeds birth-rate significantly in Latvia. According to the Central Statistical Bureau, 2 million 271 thousand people were living in early 2008 in Latvia or 10.4 thousand less than a year before. These data support the fact that number of inhabitants decreases every year in Latvia that can affect the economic growth and general development of the country, substantially.

At present, the generation born in the 1980s is entering the labour market. Growth of birth-rate was observed at that time in Latvia; therefore this generation is large in numbers. In turn, the generation retiring or getting prepared for retirement currently, is relatively little in numerical terms. In 3 or 4 years, young people born in the 1990s, when birth-rate was very low in the country, will enter the labour market of Latvia, and they will have to provide income to the state budget for the country to pay pensions to the growing number of senior citizens. In numerical terms, it appears as follows: 300,000 children should have been born in the 1990s since as many as that people will retire in the next decade, though only 200,000 were born out of which a part could take the opportunity of free movement and migrate to other EU member states for employment purposes. Ilmārs Mežs, a demographer has said that every year, we can cross out a medium-sized town on the map of Latvia – one Madona, one Kuldīga, as the birth-rate is 10,000 people less than death rate (Latvian Immigration Policy, 2007).

Judging by citizenship of immigrants, between May 1, 2004 and June 30, 2006, mainly citizens of Russia (20.52%), Ukraine (12.88%), Lithuania (9.08%), and the USA (5.18%), also citizens of Belarus and Moldova, have entered Latvia for employment purposes, yet number of legal

immigrants from other countries did not exceed 5% (Concept on Migration Policy in the Employment Context, 2007). A trend is evident that inhabitants of the CIS countries come to Latvia. In this case, Network Theory can be mentioned, when individual's social network is made use of in seeking for job. Employers can even encourage formation of networks in order to get employees for themselves. By the data of researches, entry is associated to the fact that relatives or acquaintances live in Latvia, or marry inhabitants of Latvia. Inhabitants of this region also do not have language barriers as they can work and live daily applying their knowledge of Russian (Latvian Immigration Policy: Problems and Prospective, 2006). On the one hand, such evolution of the situation is clear as part of inhabitants of Latvia had previous relation to the CIS countries, a part has used to immigration from those countries during the years of Soviet rule. Assessing opinions of experts one can say that there is a view that it will be easier for citizens of the mentioned countries to integrate in the society of Latvia. As to integration, usually this means integration into Latvian culture and language space in Latvia. However, encountering large community speaking Russian, new immigrants from the CIS countries would integrate in the Russian-speaking community not striving for integration into Latvian speaking community at all. This could result in problems in the future as the share of Russian-speaking community would grow in Latvian society. Many entrepreneurs wish to promote immigration of inhabitants of the former USSR republics as they know Russian themselves, and therefore hope that it would be easier to communicate with guest workers.

Researchers of Hansabanka have identified factors why immigrants from the CIS countries come to Latvia. Firstly, the income rate is comparatively lower in the CIS countries than in Latvia; therefore higher wage generates attractiveness. Secondly, a significant factor is geographical vicinity of the countries and, thirdly, resemblance of cultures and knowledge of the language is important (Kazāks M., Kūle L., Strašuna L., 2007). These factors reflect presumption of the Neoclassical Economic Theory that the main reason for labour force migration is difference in wages among countries. But the factor of resemblance of cultures may be related to the Common Causal Relationship Theory emphasising availability of cultural environment as well as regional distribution of human capital as essential factors encouraging migration.

The fact that guest workers from the CIS countries come to Latvia due to language availability could be addressed via World Systems Theory based on historical circumstances when migration of inhabitants among regions took place as a result of political effects. Former rule of the USSR is mentioned as an example of this theory when political intervention resulted in sending of people to many countries for military purposes; their family members joined them later staying for domicile in regions of migrants. Citizens of the CIS countries identify themselves with the Baltic States due to common historical past, resemblance of cultures and availability of language; therefore they migrate right to Latvia, Estonia, or Lithuania for employment purposes (Indāns I., 2006). World Systems Theory emphasises that migrating this way close ties are preserved among migrants and country of origin that is observed in several generations. In the course of time, migrants having entered regions may build up a common international communication network that later can affect economic relations, social and political institutes as well as culture and national identity of a hosting country. It should be noted that the negative attitude of the society of Latvia towards immigrants is attributed directly to historical memory about feeling of threat to national identity having been especially pronounced under circumstances of the Soviet regime.

It should be mentioned that totally different regulation is applied to the EU citizens in Latvia. As Latvia joined the Schengen Treaty Zone, there are no any borders among the EU member states; thus citizens of the EU countries may move freely within the limits of the Schengen area. The only condition is registration with the competent authority of the hosting country if term of stay exceeds 90 days (Procedure of Entry and Residence of Citizens of the Member States of the European Union, of the States of the European Economy Area and of the Swiss Confederation and their Family Members in the Republic of Latvia, the Cabinet Regulations No. 586, 2006 of the Republic of Latvia). This liberal regulation, though, is not a reason for citizens of the EU member states to go to Latvia seeking for job. Reasons for such behaviour can be economic situation of Latvia, problems of infrastructure, shortage of social security as well as the overall image of the country.

The European Commission and the EU Parliament have lately announced several initiatives to address the migration flows lately. One of the most important is "A Common Immigration Policy for Europe", which puts forward 10 common principles with concrete actions for the implementation (A Common Immigration Policy for Europe, 2009). These principles are mainstreamed under the three main strands of the EU policy – prosperity, solidarity, and security. Now it is time for Latvia to work on it.

Conclusions

1. Unregistered emigration of labour in unknown scale and fleeing of highly skilled professionals are two significant imperfections of migration flows management.
2. Given that the EU single policy of migration is on the development stage it does not provide possibility to assess long-term impact of the EU legal and political instruments on the EU member states, including Latvia.
3. There is no any clearly stipulated legal and judicial regulation in the entire EU for management of labour force migration flows.
4. Latvia has not any single coordinating mechanism of labour force migration management. The present institutional arrangement of migration

regulation is fragmented which makes difficult analyse general situation and elaborate proper directions of action in the field of coordination of labour force migration.
5. Latvia's migration policy is conservative in relation to employment and it is focussed on domestic labour market protection. The procedure of labour force admission from the third countries is strictly regulated; however without fixing quotas for admission of guest workers. Under the effective standard acts, employers are entitled to admit guest workers of any qualification in all sectors of the national economy. There is an insignificant number of foreign employees who have entered Latvia, though it has a growing trend.
6. When assessing liberalisation possibilities of immigration policy, it should be considered that Latvia has a reserve of labour force which is not engaged in the labour market. Knowledge-based economic policy shall be formed under the National Development Plan and National Lisbon Programme. Therefore, it is important to use the existing labour resources of the country more efficiently through application of innovations, machinery, and modern technologies. Sadly, Latvia is mentioned among the most underdeveloped countries in the field of introduction of technologies and innovations as compared with other EU countries.
7. Migration is unused opportunity for Latvia to secure cheep labour (like Ireland, Great Britain), highly skilled professionals (like Sweden, Norway) wealthy households/investors (like Austria, Switzerland) for rapid development of the economy.
8. Latvia has to work out its own immigration policy within the framework given by "A Common Immigration Policy for Europe 2009."

Proposals

1. The government of Latvia shall work out and implement a system which monitors, studies and communicates migrants.
2. The government of Latvia shall use migration policy as a competitive advantage against other countries to boost the economic activity.
3. Drastic reduction of bureaucratic obstacles, introduction of economic, social, education and financial incentives, and huge amount of foreign direct investment is needed to return back migrants who have left this country for jobs and better life elsewhere.

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Veselības aprūpes pakalpojumu pieejamība un to problēmas reģionos Latvijā
Availability and Problems of Health Care Services in the Regions of Latvia

Anita Rācene, Mg.oec, LLU Ekonomikas katedras doktorante

Abstract. The research on health care in general has taken various forms; however neither publications in the field literature nor newspapers provide the study on social infrastructure development of the medical practices. Consequently, this problem has launched a new research topic.
Health and social care sector is identified as the field, which requires substantial resources, and rational and efficient use of the resources. The first task for the professionals working in medicine is to harmonise the issue of resources according to the national requirements.
The paper includes results on medical practices in several districts and towns, their activities and several possibilities of practices to frame the financial model as well as factors facilitating or hindering successful operation of medical practices.
The research covers the study of regulatory and information base – research publications of Latvian scientists, laws of the Republic of Latvia, orders of state institutions, reports, studies, statistical data, theoretical literature, survey data, and other materials. The following methods are used to describe the regulatory framework: abstract, logical, analysis and synthesis, and a constructive method of calculation. The research is also based on statistical research methods: descriptive statistics and correlation analysis as well as sociological research method – a survey is applied to clarify the problems of social infrastructure development.
The questionnaire was aimed to identify the types of medical practices, their technical and financial provision, problems, and possible solutions for the improvement of their performance. The research object is services provided by medical practices. The questionnaire was organised to achieve the research aim. It was conducted from May, 2009 to August, 2009, when 450 questionnaires were sent to the managers of medical practices by e-mail. As a result 106 valid responses were received fully representing all regions of Latvia.
The research novelty – updated information on social infrastructure development problems of medical practices related to funding, and the government support as well as proposals for the improvement of social infrastructure development and optimisation.
Key words: patient, health care, medical practices.

Ievads

Atbilstoši LR Satversmes 111. pantam, kurā ir teikts, ka „Valsts aizsargā cilvēku veselību un garantē ikvienam medicīnas palīdzības minimumu", tautas veselība ir prioritāte arī šajā krīzes laikā.

Veselības aizsardzības jomu reglamentējošā normatīvā bāze Latvijā pēc neatkarības atjaunošanas ir veidojusies nesistemātiski, risinot konkrētas problēmas, kuras aktualizējušās dažādos laika periodos, un ļoti biežā veselības aprūpes finansēšanas noteikumu maiņa nav radījusi stabilu pieejamību veselības aprūpes pakalpojumiem. Veselības aprūpes pamatu veido primārā aprūpe, ko nodrošina ģimenes ārsti. Lai atrastu ārstu praksu piemērotāko finansēšanas un investīcijas modeli, kā arī lai realizētu LR Satversmes 111. pantā noteikto, nepieciešams izpētīt un analizēt esošo situāciju ārstu prakses darbībā saistībā ar to sociālās infrastruktūras nodrošinājumu un finansējuma veidu, lai atrastu optimālāko variantu un nodrošinātu stabilu attīstības iespēju veselības aprūpes pakalpojumu sniedzējiem, neatkarīgi no to saimnieciskās darbības un īpašuma formas, kā arī garantijas investoriem.

Pētot zinātnisko literatūru un veselības aprūpes speciālistu, ekonomistu publikācijas, kā arī tiesiskos un normatīvos dokumentus, var secināt, ka veselības aprūpes reforma, ārstu prakses un ar to saistītā darbība, plaši atspoguļota presē. Regulāras publikācijas par veselības aprūpes finansēšanas avotiem, principiem, par ārstu prakses darbību un to problēmām ir žurnālā "Medicine",, gan arī raksti laikrakstā "Diena", „ Neatkarīgā Rīta Avīze". Jaunākie pētījumi veikti sākot ar 2006. gadu. Latvijas Universitātes Pēcdiploma Medicīniskās izglītības institūts un Latvijas Universitātes Filozofijas un socioloģijas institūts 2006. gadā veica pētījumu „Veselības aprūpes pakalpojumu pieejamība Rīgā un Vidzemē", 2007. gadā „GfK Custom Research Baltic" veica pētījumu par ģimenes ārsta motivāciju lemjot par nosūtījuma nepieciešamību pie speciālista. Kvalitatīvo pētījumu studija 2008. gadā veica pētījumu par „Latvijas iedzīvotāju motivāciju un attieksmi pret neoficiālajiem maksājumiem ārstniecības personām". Pētījumi par veselības aprūpi kopumā ir veikti dažādos veidos, bet par ārsta prakšu sociālās infrastruktūras attīstību nav bijuši veikti pētījumi, ne publikācijas specializētājā literatūrā vai laikrakstos. Līdz ar to ir aizsākta jauna tēma pētījumiem. Darbā izmantoti LR un ES likumdošanas akti, kā arī autores veikto aptauju dati,

1.tabula

Aptaujā piedalījušo ārstu prakšu pierakstīto pacientu skaita analīze
Analysis on the number of patients registered in medical practices

Statistikas rādītāji	Statistical indicators	Rezultāts
aritmētiskais vidējais	mean	1829.914286
mediāna	median	1800
moda	mode	1800
amplitūda	range	7400
minimums	minimum	600
maksimums	maximum	8000
novērojumu skaits	count	106

Avots: Autores veiktie aprēķini pēc aptaujas datiem.

kuri tika modelēti un pielāgoti šo dienu situācijai un sniegti konkrēti priekšlikumi.

Zinātniskais raksts sagatavots pamatojoties uz veikto pētījumu dažādu ārstu praksēs, izmantojot anketēšanu no 2009. gada maija līdz 2009.gada augustam.

Pētījuma hipotēze : ārstu prakšu pilnvērtīgai un dinamiskai darbībai ir nepieciešama sakārtota sociālā infrastruktūra.

Pētījuma mērķis: noskaidrot ārstu prakšu pakalpojumu pieejamību un to galvenās problēmas Latvijas reģionos.

Darba uzdevumi:

- Analizēt ārstu prakšu pieejamības atšķirības Latvijas reģionos.
- Noskaidrot ārstu prakšu pieejamības ietekmējošos galvenos faktorus .
- Izvērtēt sociālās infrastruktūras nodrošinājumu ārstu praksēs.

Materiāli un metodes

Publikācijas darba uzdevuma īstenošanai un mērķu sasniegšanai tika izmantota normatīvā un informatīvā bāze – Latvijas zinātnieku pētījumu publikācijas, Latvijas Republikas (LR) likumi un citi normatīvie akti, LR valsts institūciju rīkojumi, ziņojumi, pētījumu rezultāti un citi materiāli, statistikas dati, teorētiskā literatūra, aptaujas dati un citi materiāli. Normatīvās bāzes izpētei un tās pilnveidošanas priekšlikumu izstrādei ir izmantotas vispārzinātniskās pētījumu metodes: abstrakti loģiskā, monogrāfiskā, analīzes un sintēzes, aprēķinu konstruktīvā metode. Statistikas datu analīzei – statistisko pētījumu metodes: aprakstošā statistika, sakarību analīze. Ārstu prakšu sociālās infrastruktūras attīstības problēmu noskaidrošanai izmantota socioloģisko pētījumu metode – aptauja, pielietojot anketēšanu.

Rezultāti un diskusija

Aptaujas mērķis bija noskaidrot ārstu prakses veidus, to nodrošinājumu, problēmas un iespējamos risinājumus darbības uzlabošanai. Pētījuma objekts ir ārstu prakses pakalpojumi Latvijas reģionos un šo mērķu sasniegšanai tika veikta ārstu prakšu vadītāju anketēšana. Aptaujas rezultāti izmantojami apkopotā veidā. Tā tika veikta no 2009. gada maija līdz 2009. gada augustam, izsūtot 450 anketas ārstu prakšu vadītājiem pa e-pastu un saņemtas 106 derīgas atbildes, kuras pārstāvēja visus Latvijas reģionus. Rezultāti apstrādāti izmantojot grupēšanas metodi, aprakstošo statistiku, izmantojot MS Excel.

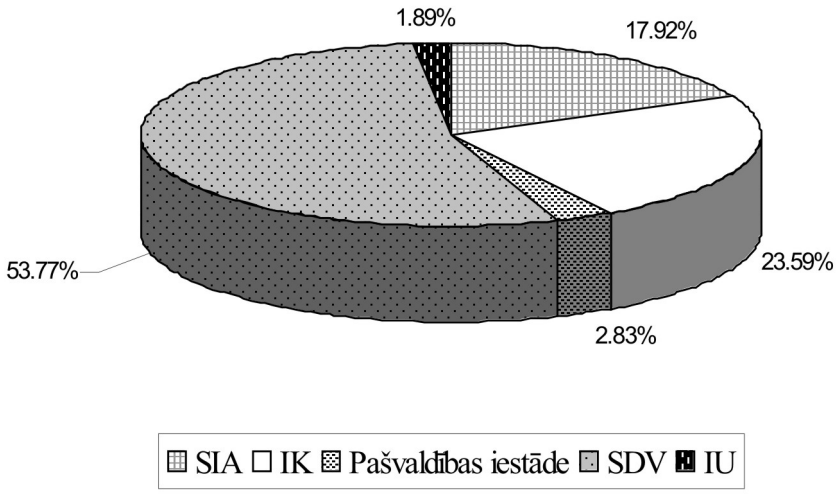
Respondentu - ārstu prakšu vadītāju raksturojums

Aptaujāti 106 ārstu prakšu vadītāji no visiem Latvijas reģioniem. Visvairāk respondentu pārstāv Zemgales reģionu – 33%, tad Kurzemes reģionu – 18%, Vidzemes reģionu – 17%, Latgales reģionu – 16% un Rīgas reģionu – 16%. No tiem 8 vīrieši, 98 sievietes, vidējais vecums 44 gadi. Lai analizētu datus par pierakstīto pacientu skaitu ārstu praksēs, izmantots MS Excel datu analīzes rīks Descriptive Statistics un aprēķināti vienlaicīgi vairāki statistiskas rādītāji.

Pēc statistikas rādītājiem var secināt, ka izmantojot aptaujas datus – vidējais pierakstīto pacientu skaits vienā ārstu praksē ir 1829 pacienti, mediāna ir 1800, moda ir 1800. Visbiežāk starp novērojumiem ārstu praksē pierakstīto pacientu skaits ir 1800. Amplitūda ir starpība starp lielāko un mazāko pierakstīto pacientu skaitu ārstu praksēs ir 7400. Tas nozīmē ka ārstu prakses lielumā ir būtiskas atšķirības, kas ietekmē arī veselības aprūpes kvalitāti un pieejamību. Vismazākais pierakstīto pacientu skaits ārstu praksē ir 600, kas novērojams lauku teritorijās, bet vislielākais pacientu skaits ārstu praksē ir 8000 pacienti, kas novērojams Rīgas reģionā.

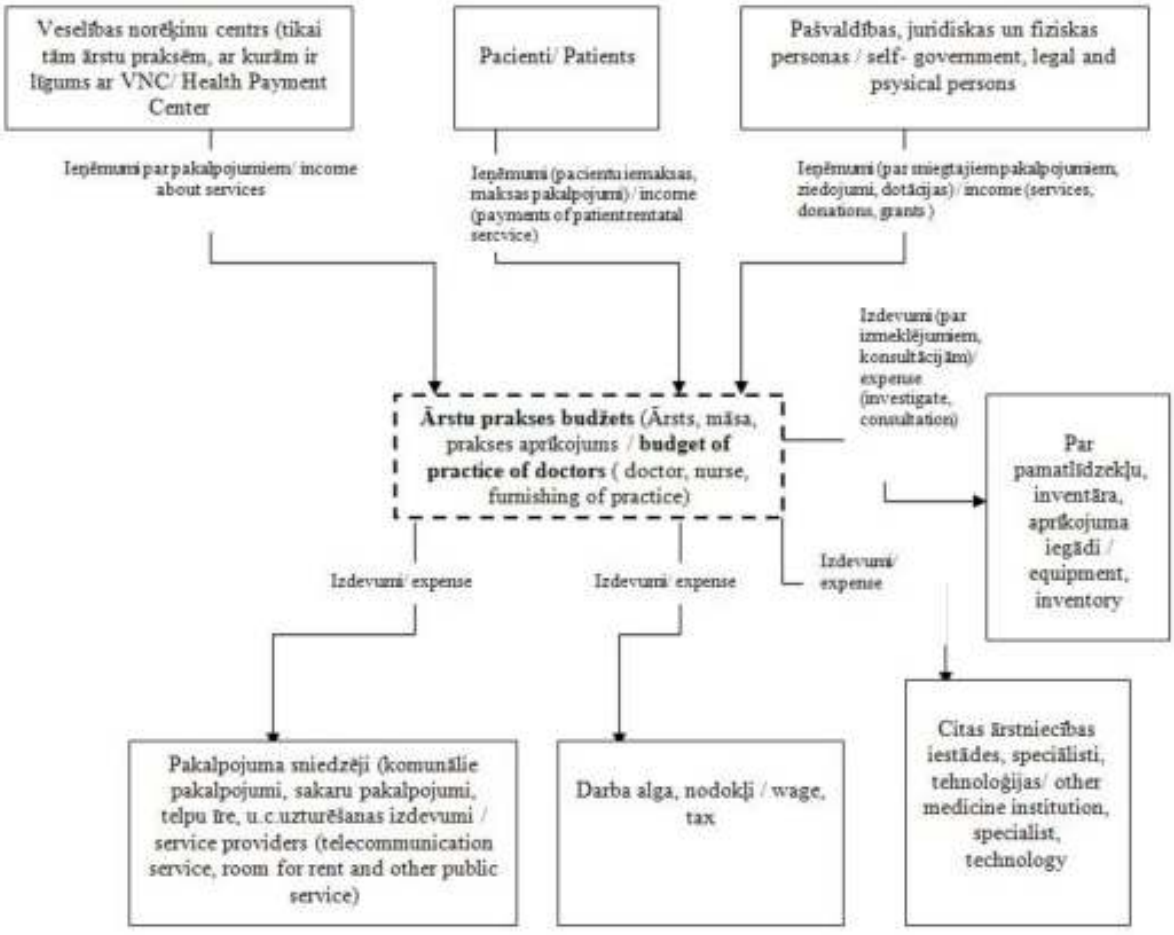
1. Ārstu prakšu darbības tiesiskā bāze, finansiālais modelis
1. Legal basis and financial model of medical practices

Ārstu prakses darbību regulē likums "Par prakses ārstiem", kurš pieņemts 1997.gada 24.aprīlī. Šajā likumā ir noteikts, ka prakses ārsts ir sertificēts ārsts, kas šajā likumā noteiktajā kārtībā reģistrējis ārsta praksi un nodarbojas ar ārstniecību, un ārsta prakse ir šajā likumā noteiktajā kārtībā reģistrēta īpaši iekārtota darba vieta, kur prakses ārsts veic ārstniecības darbību.



Avots: Pēc autores veiktā pētījuma datiem.

1.attēls. **Ārstu prakšu juridiskās forma**
Figure 1. **Legal forms of medical practices**



Avots: Pēc autores veiktā pētījuma datiem.

2.attēls. **Ārstu prakses darbības finansiālais modelis**
Figure 2. **Financial model of medical practices**

No pacienta viedokļa visas medicīniskās aprūpes iestādes var iedalīt divās grupās:

- tās, kurām ir līgums ar veselības norēķinu centru;
- tās, kurām nav līguma ar veselības norēķinu centru.

Valsts garantēto veselības aprūpi var saņemt pie ārsta vai ārstniecības iestādē, kuram ir līgumattiecības ar veselības norēķinu centru. Saņemot valsts garantēto veselības aprūpi ir jāmaksā tikai pacienta iemaksa. Pacienta izdevumi būs mazāki, ja pacients reģistrēsies pie primārās aprūpes ārsta. Pastāv arī iespēja apmeklēt ārstu, kam nav līguma ar veselības norēķinu centru, bet tajā gadījumā visi ar medicīnas aprūpi saistītie izdevumi pacientam jāsedz pašam.

Ārstu prakses veidi ir:

- primārās veselības aprūpes ārstu prakses (kuras saņem finansējumu no valsts līdzekļiem);
- zobārstniecības prakses (kuras arī saņem daļēju finansējumu no valsts un daļēji pakalpojumi par pilnu maksu);
- ārstu privātprakses (pilnīgs pašfinansēšanās princips).

Savā darbībā prakses ārsts ir finansiāli patstāvīgs. Prakses ārsts kārto savu ieņēmumu un izdevumu uzskaiti normatīvajos aktos noteiktajā kārtībā. Prakses ārsta ieņēmumus veido pacientu, valsts, pašvaldību, apdrošināšanas sabiedrību un citu fizisko vai juridisko personu maksājumi par veselības aprūpes pakalpojumiem un apmācību.

Pēc juridiskās formas no visiem aptaujā piedalījušo ārstu prakšu, 53.77% ir saimnieciskās darbības veicēji (turpmāk tekstā, SDV), 23.59% ir individuālie komersanti (turpmāk tekstā, IK), SIA – 17.92%, individuālie uzņēmumi (turpmāk tekstā, IU) – 1.89%, pašvaldības iestādes – 2.83%. (skatīt 1.attēlu).

Prakses ārsta ieņēmumus veido:

- Tiesiskajos aktos noteiktie fizisko un juridisko personu maksājumi par ārstniecisko, diagnostisko, preventīvo, medicīniski rehabilitatīvo vai konsultatīvo palīdzību, kā arī par rezidentu apmācību.
- Kā arī juridisko un fizisko personu ieguldījumi un maksājumi prakses ārstu darbības attīstībā.

Prakses ārsta izdevumus veido:

- Maksājumi par ārstnieciskajiem, diagnostiskajiem, preventīvajiem, medicīniski rehabilitācijas vai konsultatīvajiem pakalpojumiem.
- Kā arī par prakses uzturēšanu, normatīvajos aktos noteiktie nodokļu maksājumi, maksājumi līgumattiecībās esošajam medicīniskajam personālam u.c.

Ārsta prakses finansiālās darbības modelis attēlots 2.attēlā.

2. Veselības aprūpes pakalpojumu pieejamību ietekmējošie galvenie faktori
2. Main factors impacting the availability of health care services

2.1. Ārstu prakses nodrošinājums ar personālu. Ārstu prakses nodarbina maz ārstu palīgus un māsas (parasti strādā tikai pats ģimenes ārsts). Pēc aptaujas datiem no 106 ārstu praksēm, tikai viens ārsts speciālists strādā 102 ārstu praksēs, t.i. 96.00%, divi ārsti – 2.12%, pieci ārsti - 0.94% un seši ārsti ir nodarbināti 0.94% no kopējo aptaujāto ārstu prakšu skaita. Viena medicīniskā māsa nodarbināta 59.4% ārstu praksēs, bez māsas strādā 30.2%, 10.4% no aptaujāto ārstu praksēm ir trīs un vairāk māsas. Uz aptaujā uzdoto jautājumu – „Vai Jūsu ārstu praksē medicīnas darbinieku personāls ir pietiekošs?" – 60.37% respondentu atbildēja apstiprinoši. Tas nozīmē, ka lielākā daļa ārsti strādā vieni, uzņemoties papildus funkcijas, pamatojot to ar zemo finansējumu, kurš ir atkarīgs no pierakstīto pacientu skaita.

2.2. Ģimenes ārstu prakses juridiskās un finanšu problēmas. Ārstu prakses vadītāji plāno un prognozē savas prakses gan finansiālo darbību, gan profesionālo darbību, lai praksē nopelnīto finansējumu, dotācijas, ziedojumus u.c. finansu līdzekļus izlietotu sabalansēti, gan arī, lai noteiktā laikā pacientiem būtu iespējas saņemt ārstniecības pakalpojumus no citām ārstniecības iestādēm. Arī ar savu profesionālo darbību, zināšanām ārsts varētu sniegt kvalitatīvu un savlaicīgu ārstēšanu un diagnostiku pacientiem. LR likumā „Par prakses ārstiem", ir minēts, ka prakses ārsts ir sertificēts un licencēts ārsts, kurš noteiktā kārtībā reģistrējis ārsta praksi un nodarbojas ar ārstniecību, un ka kopprakse ir uzņēmējsabiedrība ar juridiskas personas tiesībām, ko nodibinājuši sertificēti ārsti, lai veidotu kopīgu praksi. Prakses ārstu apvienība ir līgumsabiedrība, ko nodibinājuši prakses ārsti, lai kopīgi risinātu ar ārsta prakses darbu saistītus jautājumus. Savā profesionālajā darbībā prakses ārsts ir finansiāli pastāvīgs, kārto savu ienākumu un izdevumu uzskaiti likumā "Par grāmatvedību" u.c. tiesību aktos noteiktajā kārtībā. Prakses ārsts maksā ienākuma nodokli un citus nodokļus. Prakses ārsts ir juridiski atbildīgs par savu profesionālo darbību un prakses ārsta profesionālās darbības risks ir obligāti apdrošināms, kas paredz nodrošināt prasījumus, kas var rasties sakarā ar nepareizu vai kļūdainu profesionālo darbību, kā arī var apdrošināt prakses telpas, inventāru, kā arī iespējamo profesionālās darbības rezultātā iespējamo zaudējumu risku.

Pateicoties Veselības norēķinu centra darbībai Latvijā ir sarežģīta finansēšanas kārtība, ka katra slimnīca ir spiesta uzturēt savus juristus un ekonomistus, lai aizpildītu visas atskaites un sarakstītu prasīto dokumentāciju, bet ģimenes ārsta darbā dokumentu aizpildīšanai, kas ļauj no Veselības norēķinu centra saņemt naudu, paiet vairāk nekā 2/3 ārsta un medicīnas ārsta laika. (Apinis P. ,2008.).

2.3. Veselības aprūpes speciālistu trūkums lauku reģionos. Jau sākot ar 2008. gadu ārstu skaits samazinās, bet vēl atbilst Eiropas līmenim, bet medicīnas māsu skaits samazinājies divkārt aiz attīstītajām valstīm. Savukārt ārstu vidū vērojams novecošanās process, un vairāk nekā puse Latvijas ārstu ir pirmspensijas vai pat pensijas vecumā. (Apinis P. ,2008.). Veselības aprūpes speciālistu resursi ir izšķirošais veselības aprūpes faktors, jo

tieši viņi ir galvenie politiku un programmu īstenotāji. Kadru resursiem ir jābūt skaitliski pietiekamiem un nodrošinātiem ar iemaņām un kompetences līmeni, kas atbilstu veselības dienestu prasībām un paredzamajām vajadzībām. Kā arī jāpilnveido savas prasmes aprūpes kvalitātes paaugstināšanā. Integrētu veselības aprūpi var nodrošināt tikai daudzprofesionāla veselības profesionāļu komanda. Veselības profesionāļu izglītība jāplāno atbilstoši sabiedrības veselības prasībām un ar mērķi, ka tiek iegūtas nepieciešamās zināšanas un praktiskās iemaņas. Visas vietas, kur tiek sniegta veselības aprūpe, kā, piemēram, mājvietas, skolas, darba vietas, primārās veselības centri, iestādes un stacionāri, jāiesaista izglītības procesā kā izglītības pamatbāzes. Veselības darbinieku visa līmeņa izglītībai – bāzes un pēcdiploma un kvalifikācijas paaugstināšanas – jābūt savstarpējā ciešā saistībā, lai tiktu nodrošināta procesa nepārtrauktība. Lai aizsargātu iedzīvotājus no slimībām, veicinātu veselību un, kad nepieciešams, ārstētu un rehabilitētu, ārstiem jāspēj diagnosticēt pacienta un sabiedrības veselības problēmas. Tāpēc jānodrošina apmācība vadības principos attiecībā uz izmaksu efektivitāti, resursu lietderīgu izmantošanu un attiecīgajām tehnoloģijām, kā arī svarīgākajos ar veselību saistītajos ekonomisko un sociālo zinātņu aspektos. Kvalitatīva personāla darba novērtēšanas sistēma ir izšķirošs labas kadru resursu vadības aspekts. Tā ir priekšnoteikums ar veikumu saistītas darba apmaksas ieviešana. Tā ir arī cieši saistīta ar personāla kvalifikācijas paaugstināšanu. Karjeras attīstības jautājumi ir ļoti svarīgs faktors, jo tie ietekmē personāla veikumu un līdz ar to ārsta pakalpojumu sniegšanu.

2.4. Veselības aprūpes sociālās infrastruktūras nodrošināšana ārstu praksēs (medicīnas tehnoloģijas, datu bāzes, komunikācijas). Gandrīz katram mediķim ir mobilais telefons un to ir izmēģinājis un sapratis tā nepieciešamību. Bet jau vairākus gadus ārstiem ir iespēja savu darbu organizēt izmantojot datoru ar speciālu, ārstiem paredzētu, datora programmatūru. Tie mediķi, kuri savā darbā ir sākuši izmantot datorus, vairs nešaubās par to lietderīgumu, jo ir izveidota speciāla programmatūra, kas domāta ārsta darba organizēšanai. Tās priekšrocības ir :

1. Šāda programmatūra ļauj ārstam ietaupīt laiku, kas parasti tika patērēts vairākkārtīgi veidlapās rakstot pacienta pamatdatus. Datorā šie pamatdati tiek ievadīti tikai vienreiz. Katru reizi, kad jāuzraksta kāds izraksts, nosūtījums, izziņa, darba nespējas lapa, talons slimokasei, recepte – pacienta pamatdati vairs nav jāraksta, tie automātiski parādīsies izdrukātajā veidlapā.
2. Ārsta talonus Veselības norēķinu centram, tagad iespējams sagatavot ļoti ātri. Taloni tiek sagatavoti elektroniski un mēneša beigās kopējā atskaite tiek nosūtīta pa e-pastu vai arī sagatavota disketē.
3. Ārstam ir pieejama plašā informācija, ko piedāvā Internets. Veselības norēķinu centrs ir izveidojis speciālu mājas lapu, kurā ģimenes ārsti ērti var atrast savus reģistrētos pacientus. Šo pacientu sarakstu ģimenes ārsts ērti var eksportēt savā datorprogrammā.

Aptaujā, bija iekļauts jautājums par interneta pieejamību un tā lietošanu ikdienā ārsta prakses darbībā. Uz jautājumu, vai ārstu prakses (doktorāta) ēkas, telpas ir aprīkotas ar internetu, 74.53% no respondentiem atbildējušas – jā, 25.47% – nē. Uz jautājumu vai ārstu praksē ikdienas darbā tiek izmantots dators, pozitīvi atbildējuši 64.15% respondenti, daļēji – 3.77%, nē – 32.08%. Tas nozīmē, ka tomēr ikdienas darbā ārsti datoru maz izmanto.

2009. gadam veselības aprūpes budžets bija plānots par 46 miljoniem mazāks nekā 2008. gadā – tieši tik daudz izmaksā degvielas, enerģētikas, transporta pakalpojumu, zāļu cenu pieaugums kopā saskaitīts ar izdevumiem, kas jau iepriekš paredzēti par lielāku skaitu medikamentu, ko no nākamā gada valstij jāapmaksā, un virkni citu veselības organizācijas pasākumu, kuru apmaksa paredzēta nākamā gada normatīvos aktos. Piedāvātais budžets samazina iespēju pacientam saņemt diagnostiku, ārstniecību, rehabilitāciju par desmito daļu. (Apinis P., 2008) Veselības aprūpe vairs nav tik pieejama kā iepriekš. Ja vairāk nekā trešā daļa rocības dēļ neapmeklē ārstu, bet vēl trešdaļai jāgaida, minimums, nedēļa uz augoņa iztīrīšanu u.tml., tad veselības aprūpe nav ne kvalitatīva, ne pieejama. (Avotiņš V., 2008.).

Aptaujā uz jautājumu – vai ārstu praksē ir pieejami nepieciešamākās medicīniskās tehnoloģijas un medicīniskās ierīces (instrumenti, aparāti), pozitīvi atbildējuši – 92,45% respondentu, bet tomēr minējuši, ka labākai diagnostikai, būtu nepieciešami šāds papildus aprīkojums:

- dators, fakss, kopētājs;
- fizikālas terapijas aparāti;
- aparatūra vienkāršāko analīžu veikšanai uz vietas praksē un ekspress diagnostikai;
- spirogrāfs;
- aparatūra inhalāciju veikšanai;
- acu spiediena mērīšanai;
- ginekoloģiskais krēsls – kušete;
- zīdaiņu galds ar svēršanas un mērīšanas iespējām – apsildāms;
- nepieciešama atjaunošana un nomaiņa;
- elektrokardiogrāfs (jauns);
- hemoglobīna analizators;
- negatoskopi;
- jauni sterilizatori;
- internets.

Tas nozīmē, ka ārstu prakses vēlas paplašināt savu izmeklējuma loku, kā arī, lai nodrošinātu pacientu plašāku diagnostiku uz vietas praksē, kas paātrinātu pacienta slimības diagnostiku un ārstēšanu.

Paplašinot pētījumu, aptaujā iekļāvu arī par citas medicīniskās iestādes atrašanos tuvumā, gadījumā, ja būtu nepieciešama papildus palīdzība. Lai analizētu datus par tuvāko medicīnas iestādi, izmantots MS Excel datu analīzes rīks Descriptive Statistics un aprēķināti vairāki statistiskas rādītāji (skatīt 2.tabulu).

Pēc statistikas rādītājiem var secināt, ka tuvākās ārstniecības iestādes vidējais attālums ir 11.45 km, mediāna ir 7.5, moda ir 1, visbiežāk starp novērojumiem, tuvākā ārstniecības iestāde atrodas

2.tabula

Tuvāko medicīnas iestāžu attālums no ārstu prakses
The distance of the nearest medical care institutions from medical practices

Statistikas rādītāji	Statistical indicators	Rezultāts
aritmētiskais vidējais	Mean	11.45943396
mediāna	Median	7.5
moda	Mode	1
amplitūda	Range	50
minimums	Minimum	0
maksimums	Maximum	50
novērojumu skaits	Count	106

Avots: Autores veiktie aprēķini pēc aptaujas datiem.

1 km attālumā no ārsta prakses vietas. Vistuvākā ārstu prakse ir turpat blakus kabinetā vai vienā ārstniecības iestādē, bet vistālākā atrodas 50 km attālumā. Amplitūda ir starpība starp tālāko un tuvāko ārstniecības iestādes attālumu, šajā piemērā amplitūda ir 50 km. Tātad īpašu vajadzību gadījumā, lai sniegtu pacientam ātru un kvalitatīvu palīdzību, kuru nav iespējams sniegt ārstu praksē, ir jāmēro 50 km, kas var būt par ilgu, lai sniegtu kvalitatīvu un savlaicīgu palīdzību. Novērojumu skaits ir 106.

Nodrošinājumā ar transportu, kas ir ļoti svarīgs ārstu prakses operatīvai darbībai, it sevišķi lauku teritorijās, respondenti atbildot uz jautājumu – vai ārstu praksē ir pieejams vai piemērots izmantojams transports prakses vajadzībām, apstiprinoši atbildējuši – 74.53% , nav – 10.38%, savu personīgo automašīnu izmanto – 15.09%.

Izvērtējot ārstu prakses vietas pieejamību tiešā veidā, aptaujā tika uzdots jautājums - vai ārstu praksē atrodas pacientiem ērti pieejamā vietā, ierobežojumi, traucējumi, un visbiežāk minēti šādi trūkumi:

- sabiedriskā transporta reta kursēšana;
- nav piebraukšanas iespējas līdz kāpnēm – pacientiem ar kustību traucējumiem tas rada problēmas, sevišķi ziemā;
- prakse atrodas daudzdzīvokļu mājas 1.stāvā un tai ir kopēja ieeja ar pārējiem mājas iedzīvotājiem;
- telpas pa šauru;
- nav kur novietot transportu;
- ārstu prakse atrodas 2.stāvā, kas apgrūtina piekļūšanu gados veciem pacientiem, kā arī ar kustību traucējumiem;
- nav pielāgotas uzbrauktuves invalīdu ratiņiem.

Latvijas ārstu ieteikums katram iedzīvotāju veselības uzlabošanā ir šāds:

- lietot adekvātu uzturu;
- daudz kustību;
- tīrs ūdens un tīrs gaiss;
- primāra un sekundāra profilakse;
- zāļu pieejamība;
- kvalificēta medicīnas personāla pieejamība;
- fiziska un mentāla komforta apstākļi sadzīvē;
- kaitīgo ieradumu kā smēķēšana, alkoholisms, narkomānija izskaušana.

Secinājumi
Conclusions

Ārstu prakses laukos galvenās problēmas ir:

- ārsta darbs laukos ievērojamā mērā pakļauts sabiedriskā transporta kustības grafikam, lai attālākie lauku pacienti varētu apmeklēt ārstu;
- daudzu laukos dzīvojošo pacientu attālums līdz tuvākai ārstniecības iestādei svārstās robežās no 20 līdz 50 km;
- lēna informācijas aprite, ko raksturo ierobežota pieeja internetam un prasmes izmantot datoru kontaktos ar pacientiem.

Ārstu prakses pilsētās galvenās problēmas ir:

- pārāk liels pacientu skaits, kas liedz nodrošināt visaptverošu un kvalitatīvu pacientu aprūpi.

Kopējās problēmas:

- programmatūras, kuras piedāvā ārstiem, būtiski atvieglotu darbu ar dokumentiem un pacientu uzskaiti, bet ir dārgas, un līdz ar to ierobežotas iespējas iegādāties;
- darbs ar dokumentiem aizņem lielu daļu no ārsta darba, un tas samazina lauku, ko atvēlēt pacientam;
- zemais ārstu pakalpojuma finansējuma līmenis, ko nosaka pacientu skaits, apmeklējums, pacientu maksa un pacientu dzīves līmenis, nedod iespēju pieņem papildus darbiniekus (grāmatvedi datora operatori, automašīnas šoferi).

Ieteikumi problēmu risināšanai:

- noteikt uz vienu ārstu praksi mazāku pacientu skaitu;
- izveidot ārstu praksēs vienotu datorizētu informācijas apmaiņas sistēmu;
- pašvaldībai nodrošināt pacientu pieejamību pie ārsta, kas laukos ir stipri apgrūtināta. Paredzēt budžetā papildus samaksu par maksātnespējīgo pacientu pacienta iemaksu un citus maksājumus (injekcijas, mājas vizīti, medikamenti), lai tas nav jādara mediķim;
- izveidot plašāku sadarbību ar sociālo dienestu, lai varētu piesaistīt sociālos aprūpētājus saslimšanas gadījumos;
- iedalīt papildus līdzekļus personālam ārsta palīgam (ar transportu), lai varētu veikt hronisko pacientu aprūpi mājās, (tagad arī akūto);

- organizēt sociālo darbinieku sadarbošanās ar ārstiem;
- iespēju robežās paplašināt ārsta praksi ar speciālistiem;
- izveidot bērnu ratiņu novietni, ko paredz obligātās prasības ārstu praksēm;
- nodrošināt operatīvu datu apmaiņu ar konsultantiem, izmeklējumu rezultātiem.
- izveidot vienotu mediķu apmācību medicīnas tehnoloģiju izmantošanā;
- pieļaut īslaicīgu elektronisku pieeju pacienta datiem kolēģa datubāzē (kad ir aktuāla ārstu aizvietošana un dežūrārstu tēma lai to būtu vieglāk risināt);
- organizēt un atbalstīt ārstu prakses datorizēšanas pasākumus;
- veidot ciešāku sadarbību ar novadu pašvaldībām.

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Cadastral Valuation Models

Vivita Baumane, Mg.oec., Ph.D student
Faculty of Economics, Latvia University of Agriculture

Abstract. In accordance with legislative enactments cadastral or mass valuation shall be used for calculation of cadastral value, which is used for administration of real property tax. Cadastral valuation is based on the real property market information in market economics of European and other countries. There are some countries where taxes are calculated as a down payment area – expressed as a fixed amount per unit, depending on the land or buildings in use – the so-called normative value, but this practice is not common internationally, since the normative value does not describe the object, and it is not conducive to the economic development.
The aim of the article is to survey the present cadastral valuation process in Latvia. The study provides the research results in the field of cadastral valuation, describes calculation of cadastral value reposing on base values and different models of cadastral valuation. The cadastral value shall be based on cadastre objects data of the State Cadastre of Real Property (hereinafter – Cadastre information system) as well as on the real property market information – information regarding purchases, lease, construction costs, real property market offer and demand, real property market activity, etc.
Consequently, the cadastral valuation process can be implemented successfully implying the use of approved cadastral valuation models and proper data of cadastral objects.
Key words: real property, mass valuation, cadastral value, cadastre object.

Introduction

In accordance with Immovable Property State Cadastre Law real property is an object of real property (a unit of land or a structure) or a set of these objects (a unit of land and a structure), which is registered in the Land Register as independent compartment. An apartment properties or apartments, artist's workshops, unoccupied premises, which have been given into ownership up to the privatisation of the residential houses, is also regarded as real property.

The concept of real property has always been associated with an ownership of a person or government and is an essential component of the national economy (A.Rausis, 1996.). Today, any state element in successful economic development is normal, world-standard real property market relations formation, and the value of the property may be used as an objective and reliable indicator to assess the tax payer – civil status and solvency of a particular period (V.Baumane, 2009).

The concept of generalised mean value of all things understood properties is expressed in monetary terms. Property owner's attitude affects the value of the property.

The value of real property may be determined by buying or selling in the calculation of the individual or the market value when calculating the compensation money in terms of loss of property or transfer the case when the real property registry, or a massive amount of tax, etc (Тарасевич Е.И., 1995). In any case, today's real property and property value are conceptual linked in economy.

The most common methods, specified in the standards for assessment of real property recognised in Latvia for determination of the value are:
- the method of comparing transactions;
- the income capitalisation method, and
- the method of costs.

Cadastral valuation of the property group is a systematic evaluation on a certain date, mostly on January 1, through the evaluation of standardised procedures and statistical analysis.

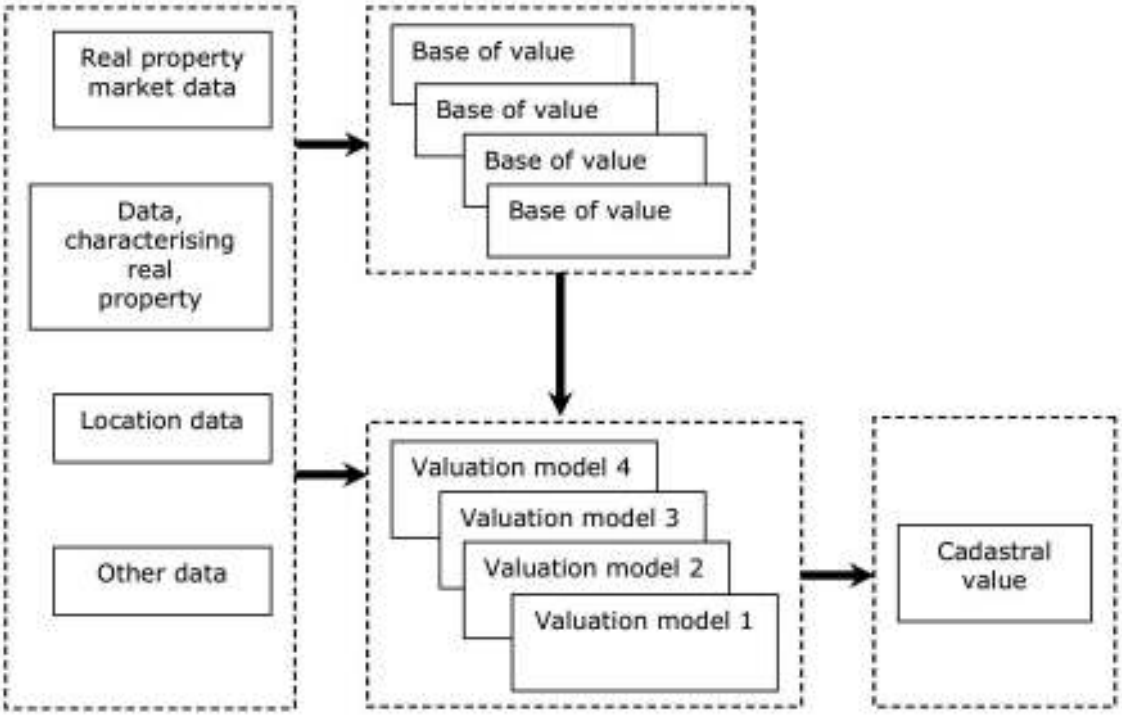
Cadastral value for real property tax shall be calculated in accordance with the information regarding transactions of real property at least for the last two years (Kadastralās vērtēšanas noteikumi, 2006).

Cadastral valuation allows calculating cadastral value for large number of cadastre objects simultaneously. Standard calculation models are used, since expenses of calculation are low.

Cadastral valuation in accordance with the laws and regulations is a set of operations implemented with single principles of cadastral assessment on a certain date in accordance with the cadastre data in monetary terms, in order to specify the value of a cadastre object. The process of cadastral valuation includes development of a cadastral value base and calculation of cadastral value (Nekustamā īpašuma valsts kadastra likums, 2005).

The State Land Service is responsible for cadastral valuation. The Cabinet of Ministers has determined the procedures for cadastral valuation in Regulations No. 305, adopted on April 18, 2006 "Regulations Regarding Cadastral Assessment". The State Land Service shall register and analyse the prices of real property market and lease payments, and determine the price level for real property. The Cadastre information system shall maintain a database of the Real property market in order to accumulate and process information regarding the real property transactions.

The base of cadastral value is very important for calculation of real property tax. It is a set of data characterising the value necessary for calculation of the cadastral value – base values and correction



Source: made by the author according to the "Regulations Regarding Cadastral Assessment"

Figure 1. **Cadastral valuation process**

coefficients, which, on the basis of data analysis of the real property market, have been specified for the group of cadastre objects in terms of values within a relatively homogenous territory – zone. The Cabinet of Ministers shall approve the base of cadastral values.

The research hypothesis is that the qualitative study of cadastral valuation models is the basis for cadastral value of any real property.

The study provides understanding on cadastral valuation process, cadastral valuation models, along with appropriate data analysis. The following tasks are put forward to achieve the set aim: 1) to evaluate cadastral valuation process and cadastral valuation calculation models; 2) to analyse the data necessary for cadastral value; 3) to make recommendations for improving cadastral valuation process.

The data of Cadastre information system and database of the Real property market maintained by the Land State Service are used in this research.

Monographic method, method of analysis as well as the method of statatistic analysis is used in the particular research.

Results and discussion

Cadastral values in Cadastre information system are calculated automatically. It allows to exclude the human errors, and to save up human resources. Cadastral valuation process is shown in Figure 1.

Since calculation of the cadastral value is calculated automatically, the process of calculation ensures:

- the estimated value of topicality, taking into account changes in the rated object to the performance indicators;
- simultaneous mass converting of cadastral value for all cadastre objects after new base of cadastral value coming into force;
- the reliability of the cadastre data used for calculation of the cadastral value;
- the mutual comparability of cadastral value of cadastral objects in the frame of one group of objects (Kadastra objekta reģistrācijas un kadastra datu aktualizācijas kārtība, 2006).

Cadastral valuation system implemented in Latvia was developed in collaboration with Swedish, Finnish, and Danish experts in frame of various intergovernmental projects. The analysis of principles of cadastral valuation system of Latvia demonstrates its common similarity with corresponding valuation systems in other European countries:

- cadastral valuation is based on data of the Real property market information system – being developed zoning and the value of the base values;
- application of the methods of internationally recognised valuation;
- cadastral value is calculated using similar criteria in accordance with all cadastre objects.

In some countries, for example in Sweden a unified model of valuation is used: the land together with buildings on it is valuated as a common undivided property. In Latvia cadastral value is calculated separately for a unit of land, building, and engineering structure. Cadastral value of real property is calculated as a sum of the cadastral values of a unit of land, buildings, and engineering structures

forming a separate real property. The Western European countries (Sweden, Denmark), value-based design used for commercial real property rents in the country, as there exists firmly established arrangements for accounting of income from rents. Current information on the income from the rental of premises and buildings from natural and legal entities related to the leased items is not guaranteed in Latvia.

Four valuation models shall be used for calculation of the cadastral value of cadastre objects. Valuation models are accepted on the level of the Cabinet of Ministers by corresponding Regulations. These valuation models are developed for valuation of:

- rural land of the rural area;
- building land;
- buildings, incl. groups of premises;
- engineering structures (Kadastrālās vērtēšanas noteikumi, 2006).

Cadastral valuation model of rural land in the rural area

Cadastral valuation of agricultural and wooded land started in 1993. The method of calculation was based on the imitation of real property market, and it existed until the method of land valuation based on the real property market was implemented in 2008. New method prescribed the use of the following data of the unit of land registered in the Cadastre Information System for calculation of the cadastral value:

- the purpose of use and division by types of use of land;
- encumbrances which affect the land value and land areas covered by them;
- the quality assessment of the utilised agricultural land in points; and
- the quality assessment of wooded land in points.

The cadastral value for rural land is calculated using the following equation (1):

$$K_v = (P_{LIZ} \times Bv_{liz} + P_M \times Bv_M + (0{,}2 \times P_{P\_Z} + P^*_{P\_D}) \times Bv^*_{LIZ} + b \times C_{maja}) \times K_{apgr} \times K_p \times K_T \quad (1)$$

where:

Kv – cadastral value in LVL;

P_{LIZ} – utilised agricultural land in hectares;

Bv_{liz} – base value of the utilised agricultural land zone in LVL per hectare;

P_M – wooded land area in hectares;

Bv_M – base value of the wooded land zone in LVL per hectare;

P_{pz} – other land area in hectares;

P^*_{pD} – area in hectares of the land under fish ponds and courtyards;

Bv^*_{LIZ} – base value of the utilised agricultural land of quality III group in LVL per hectare;

C_{maja} – constant of the affect of residential house;

K_{apgr} – correction coefficient of encumbrances;

K_p – correction coefficient of pollution;

b – feature of the residential house (b=1, if there is a residential house on the unit of land; b=0, if there is no residential house on the unit of land);

K_T – correction coefficient of market changes.

Cadastral valuation model of building land

The following data of the unit of land registered in the Cadastre Information System are used for calculation of the cadastral value:

- the purpose for use of the unit of land;
- encumbrances specified for the unit of land which affect the value of land and land areas covered by them.

The cadastral value for building land is calculated using the following equation (2):

$$Kv = \left(\sum (Bv \times P_{LM} \times K_{samaz} \times K_T)\right) \times K_{apgr} \times K_p \quad (2)$$

where:

Kv – cadastral value in LVL;

Bv – base value of the building land in LVL per square metre;

P_{LM} – land area under jurisdiction of the purpose of use in square metres;

K_{samaz} – area correction coefficient;

K_{apgr} – correction coefficient of encumbrances;

K_p – correction coefficient of pollution;

K_T – correction coefficient of market changes.

The value of building land substantially affects such indicators as security of communications, complex configuration of land unit and different allowed intensity of construction.

Online communications and building intensity factors are evaluated in part by setting the value of the border zone, but not all areas are completely homogeneous. A portion of text with fields and records shall be improved within the cadastral information system to evaluate the differences in one area. Part of the text shall supplement the data fields for each land unit to present the above figures and to evaluate the possibility of cadastral information system. Currently, automated information should be obtained only on the existence of built-up land communication unit, which houses a full cadastral survey.

Cadastral valuation model of building

The latest cadastral survey (technical inventory) data registered in the Cadastre Information System are used for calculation of the cadastral value of the building:

- the building type;
- the indicator of the building volume;
- the physical status;
- encumbrances.

The cadastral value of the building is calculated using the following equation (3):

$$\bar{E}_{KV} = \bar{E}_{Bv} \times A \times K_S \times K_{kor} \times K_{li} \times K_T \quad (3)$$

where:

$\bar{E}_{KV}$ – cadastral value in LVL of the building to be assessed;

$\bar{E}_{Bv}$ – base value of the building type complying with the building to be assessed in LVL per indicator of the volume;

A – size of the volume indicator of the building to be assessed in square meters or cubic metres;

K_S – correction coefficient of the physical state of the structure;

K_{kor} – correction coefficient of the volume effect;

K_{li} – correction coefficient of encumbrance;

K_T – correction coefficient of market changes.

The determination of the building type is necessary for cadastral valuation of the buildings. Usualy it is done performing the cadastral survey (technical inventory) of buildings, taking into account their main type of use, materials used for construction, and technical indicators (number of above-ground storeys, volume, material of the external walls).

Since buildings with building cadastral survey are defined (assigned) only as one building type, a multipurpose cadastral evaluation value is calculated in some cases inadequately, for example, a shopping centre with a permanent multi-storey car parking lot. It is important to examine the question of the physical conditions of buildings and the effect of age when determining the cadastral value. The residential development of the assessment is particularly timely now, due to the intention to levy property taxes.

The cadastral value for the group of premises is calculated from the cadastral value of the building proportionally to the area of particular group of premises. The following equation is used for this calculation (4):

$$TG_{KV} = \bar{E}_{KV} \times (TG_{kop.plat.} : \bar{E}_{kop.plat.}) \quad (4)$$

where:

TG_{KV} – cadastral value in LVL of the group of premises;

$\bar{E}_{KV}$ – cadastral value of a building, where the group of premises is located;

$TG_{kop.plat.}$ – total area of the group of premises in square metres;

$\bar{E}_{kop.plat.}$ – total area of the building in square metres, where the group of premises is located.

The cadastral value of an apartment property is calculated as:

- cadastral value of the group of premises, and
- an undivided share of the cadastral value of the building, land, and structures functionally connected, which are included in the structure of the apartment property.

Apartment property cadastral value is calculated by taking into account an apartment owned indicators of land and buildings. Such an estimate is sufficient housing property located in buildings with one use or in areas with similar values for different intended uses of objects. Apartment property located in a building or a multi-functional area with different value levels between the different uses of the cadastral value calculation should be changed; and the cadastral value shall comprise the group of premises used. Similar principles shall be followed in the group of premises evaluation. Such a model can be calculated on the condition of the building where the cadastral information system is established, and full information – cadastral survey is carried out in buildings. The issue of property valuation apartment development is particularly acute now, since the apartment is planning to levy low property taxes – by developing a model to be made in equity between taxpayers.

Cadastral valuation model of engineering structures

The latest cadastral survey (technical inventory) data registered in the Cadastre Information System are used for calculation of the cadastral value of the engineering structures:

- the engineering structure type;
- the engineering structure volume indicator;
- the engineering structure physical status.

The cadastral value of engineering structures is calculated using the following equation (5):

$$IB_{KV} = (\sum (IB_{Bv} \times A \times K_s)) \times K_T \quad (5)$$

where:

IB_{KV} – cadastral value of the engineering structure in LVL;

IB_{Bv} – base value of the engineering structure type;

A – size of the volume indicators of the engineering structure type to be assessed;

K_S – correction coefficient of the physical state of the building;

K_T – correction coefficient of market changes.

Engineering structures classification is unduly detailed from the value point of view. Evaluation of engineering structures is mainly based on the classification of engineering structures. This classification is very detailed, and it includes 752 types of engineering structures; thus creating problems for obtaining objective data.

The engineering structure type, in performing the cadastral survey, shall be determined in accordance with the following criteria: building design, a deed regarding acceptance of the structure into service, executive surveys of engineering communications, a deed of acceptance of works covered, a registration certificate of engineering structure, a passport of engineering structure, etc. The following aspects shall be taken into account to determine the engineering structure type, its main type of use, materials used for construction, technical indicators, and its constructive solution. An engineering structure may have two or more types, and two or more volume indicators, where each of them is attached to a certain type of engineering structure and the base value of the type.

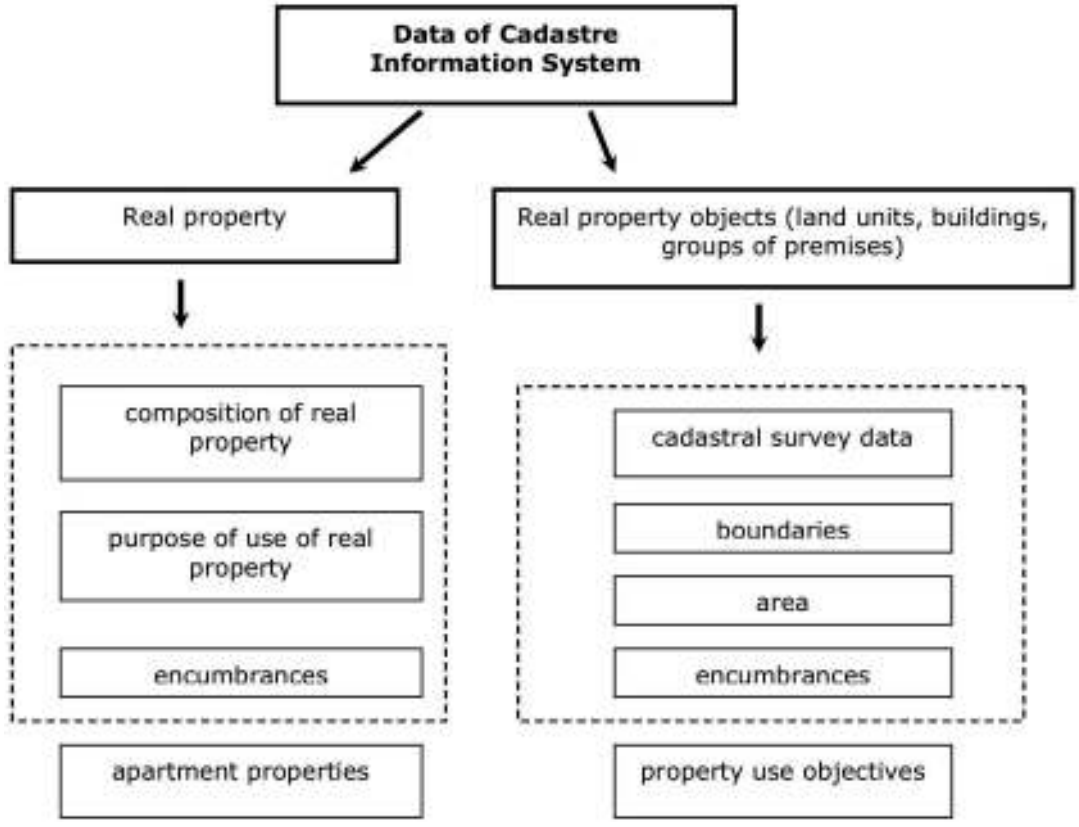
Valuation models are created from:

- market data – data on sales, cost information, income data, etc.;
- data characterising real property – data on land, buildings, groups of premises, location, etc..

The country needs computerised information on cadastral objects and characterising data, reliable information on transactions with real property, laws and regulations concerning special assessment procedure, and calculation models to implement the cadastral valuation. The study has confirmed that Latvia has met the necessary requirements:

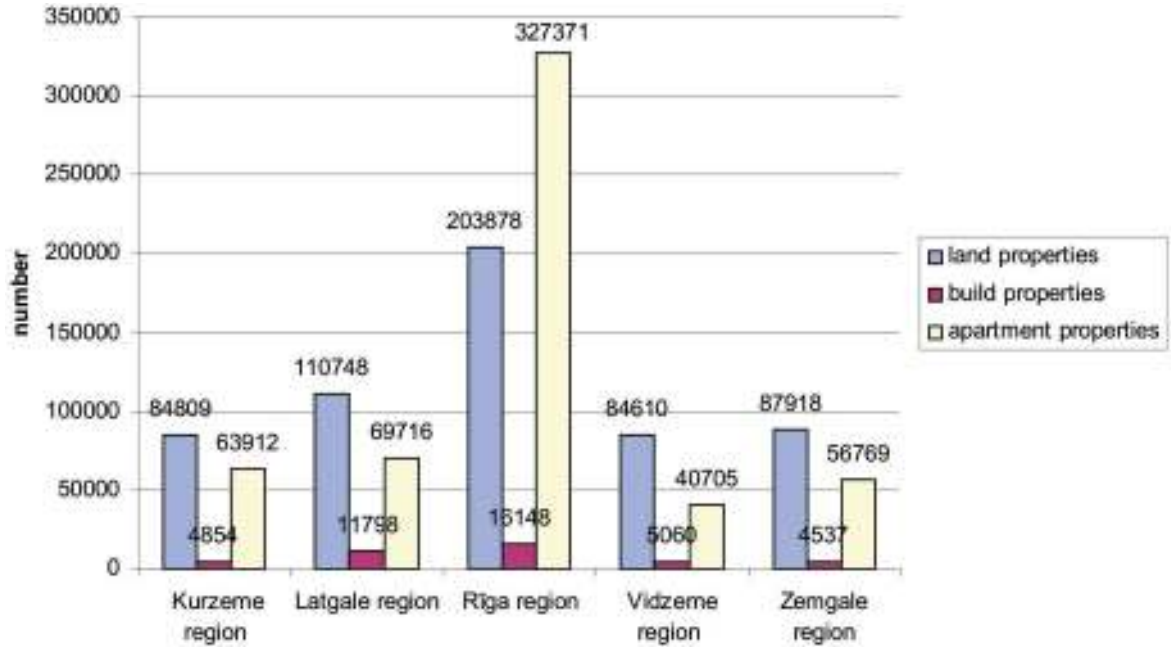
- information on cadastral objects is registered in Cadastre Information System (Figure 2);
- information on real property market transactions is registered in the database of the Real Property Market;
- the Parliament and the government have adopted the necessary legislative enactments.

In order to use the data (qualitative and quantitative indicators) of the Cadastre Information System for the development of cadastral valuation models, these data should be objective and



Source: made by the author according to the "Regulations Regarding Cadastral Assessment"

Figure 2. **Cadastre information system data mainly used in cadastral valuation models for calculation of cadastral value**



Source: made by the author according to the date of the State Land Service

Figure 3. **Number of real properties registered in the Cadastre information system (on November 1, 2009)**

Table 1

Changes of agricultural land prices in Latvia

Indicators	2000	2001	2002	2003	2004	2005	2006	2007	2008
Average price	139	143	161	187	206	492	563	797	962
Increase of the price compared with the base year (2000), in LVL	-	4	22	48	67	353	424	658	823
Increase of the rate compared with the base year (2000), in %	-	2.9	15.8	34.5	48.2	254.0	305.0	473.4	592.1

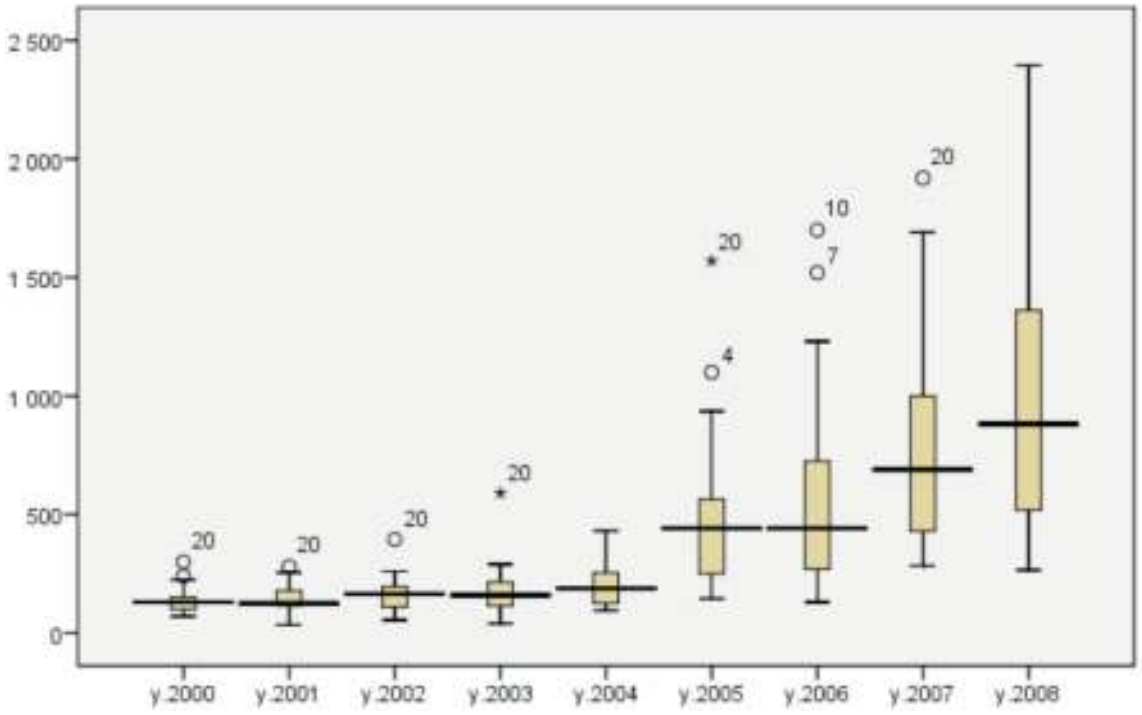
Source: author's calculations according to the date of the State Land Service

reliable on each real property and its object. On November 1, 2009 approximately 1.5 million real properties and 5 million real property objects were registered in the Cadastre Information System. The largest number was registered in Riga region (Figure 3). The tendency of increasing in the number of properties is in progress due to the subdivision of real property objects. It means that more objects will be involved in valuation process. For this purpose the data of good quality are necessary.

All cases of real property sales for which the information is compiled from the Land Book are recorded in the database of the Real Property Market. One of the problems associated with the handling of this information is presented in the price of sales contracts – it often tends to be lower than actually paid, since the parties of the transaction seek to avoid paying high state taxes when strengthening the property rights in the Land Book (state fee of 2% of property value). At relatively high property prices, the amount of stamp duty is high, which encourages the contractual parties to produce false bids. One possible solution would be to change the calculation base and the strengthening of ownership in the Land Book stating that fee is calculated from the cadastral value determined by the same principles to all properties.

Analysing the real property market data, it was observed that the prices of agricultural land will continue to grow compared with other real property prices. Assessing the price rises by the regions of Latvia, more uniform prices are observed in Vidzeme and Latgale; while a sharp rise is seen Kurzeme and Zemgale regions, where land has received the highest land quality assessment.

Analysing the average agricultural land prices in Latvia, a price rise is observed on the basis of the reference year 2000. The calculations show that the fastest rates were observed from 2004 after joining the European Union. In 2005 they reached an average price of 200% over the previous year (Table 1).



Source: made by the author according to the date of the State Land Service

Figure 4. **The number and price increases in transactions of agricultural land properties in Latvia**

It is necessary to make sure that the information used is objective and comparable when carrying out calculations using the approved cadastral models. The data shall be objective for each property item. The data having sharp differences cannot be included in the cadastral valuation models. Therefore, various market data analysis tools are used; one example is shown in a box diagram of Figure 4 (Betts Richard M., Ely Silas, 2004). The box includes 50% of the data on average; the median reflects the average value of each reporting year, which can be seen on a farmland price growth trend.

The caste chart released:

"Outliers" – points more than 1.5 box heights above or below box (circles);

"Extremes" – points more than 3 box heights above or below box (asterisks).

The analysis of agricultural land prices has shown both the divergent points of both extreme values. It can be concluded that unusual transactions with agricultural land have been concluded in the period of 2000-2003 and the period of 2005-2007. The use of cadastral valuation models should be excluded, since such data do not reflect the overall trend.

The cadastral valuation system, including development of valuation models shall meet several prerequisites – people, time and financial resources are required to develop the software for obtaining and updating the data required for the development of models.

Conclusions

1. Cadastral values in the Cadastre information system are calculated automatically; thus excluding human errors and saving up human resources.
2. The set of cadastral data is sufficient for calculation of cadastral value and it ensures the implementation of particular valuation model.
3. Cadastral valuation model comprises not only the necessary parameters, mutual obligations and real property market situation, but also data collection and updating.
4. The solution could be to change the base of calculation of state fee and to use cadastral value for excluding untypical prices in documents of transactions.
5. It is necessary to evaluate the possibility to accumulate engineering structures technical data in the Real Property State Cadastral Information System.
6. Cadastral or mass valuation is very important to ensure right real property taxation, and therefore the principles of equality have to be taken into account for the development of cadastral valuation models.

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Nekustamā īpašuma vērtības novērtēšana pie investīciju plānošanas celtniecības laikā
Real Estate Cost Estimation at Planning Investments during Construction

Viktors Voronovs, Dr.sc.soc.
Daugavpils Universitātes Sociālo pētījumu institūta vadošais pētnieks
Oksana Ruža, Mg.oec.
Daugavpils Universitātes doktorante

Abstract. Real estate sector represents extensive area of subjects of immovable character and the public attitude towards the sector. A new stratum of real estate owners has appeared both in the sphere of personal consumption and many other spheres of business activities. Operations and transactions with real estate require knowledge on project costs of an object with a high degree of accuracy and reliability. The necessity for estimation services arises at determination of investment efficiency when constructing a habitation, selling or purchasing apartments and land plots, reconstructing buildings etc..
Provision of population with housing and the development of housing construction are the major tasks and problems of this country. Hence, issues related to the cost estimation of habitation are of topical importance. Recently real estate estimation issues have become especially topical with the urgency of a question on the methodology for setting market value of habitation and other real estate belonging to natural entities for the purpose of taxation. However large building organisations – builders shall know the possible profit of an object under construction.
The research aim was to develop a complex model for setting costs and forecasting investments in capital construction. The research methodology is based on the theory of market economy, the theory of organisation, and system engineering of construction. Economic–mathematical methods and methods of mathematical statistics were used in the research.
The research has resulted in the development of a complex model for setting costs and forecasting investments in capital construction. Various methods (method of acceleration, method of profit, method of approach to the maximal cost) were considered at forecasting scales of capital investments. The research is also based on the analysis of direct income estimation and the investment repayment period analysis.
Key words: estimation of real estate, market of investments, complex model, construction.

Ievads
Introduction

Stratēģiskie lēmumi, kas tieši ir saistīti ar kapitālieguldījumu jautājumiem, normām un noteikumiem, noteikti ar iekšējo vidi, ir daudz konservatīvāki, salīdzinājumā ar vadības lēmumu pieņemšanas procesu. Attīstības stratēģijas efektivitātes paaugstināšanai ir nepieciešama pastiprināta uzmanība darbam ar iekšējo vidi, pareizi jāsadala tiesības un pienākumi firmas organizācijas struktūrā, uzlabot lēmumu pieņemšanas procesu organizāciju, kuriem ir daudz lielāka ietekme uz rezultavitāti nekā stratēģiskajiem lēmumiem.
Stratēģijas izvēli ietekmē kapitālieguldījumu prognožu aprēķini ne tikai konkrētā reģiona, bet arī visas valsts celtniecības sfērā. Tendenču analīze valsts ekonomiskās attīstības dinamikā un kapitālieguldījumu mērogā, ļauj noteikt iekšējo konjuktūru, firmas attīstības stratēģijas izvēles gadījumā.

Raksta mērķis ir sastādīt nekustamā īpašuma novērtēšanas un investīciju plānošanas kapitālajā būvniecībā, komplekso modeli.

Lai sasniegtu uzstādīto mērķi, nepieciešams risināt sekojošus uzdevumus:

1. veikt dažādu metožu analīzi, prognozējot kapitālieguldījumu mērogus;
2. veikt tiešo ienākumu novērtējuma analīzi;
3. aplūkot objekta investīciju atmaksāšanās termiņa rādītāju.

Pētījumu objekts ir nekustamā īpašuma vērtības noteikšanas procedūra, kura ļauj ar augstu precizitāti prognozēt peļņu no dzīvojamā objekta celtniecības, tai skaitā investīciju plānošanas stadijā.

Pētījuma metodoloģija tiek pamatota ar tirgus ekonomikas teoriju, organizāciju teoriju. Tika izmantotas ekonomiski-matemātiskā metode, matemātiski- statistiskā metode.

Rezultāti un diskusija
Results and discussion

Nekustamā īpašuma sfēra ir nekustama rakstura priekšmetu un sabiedrisko attiecību, kas ar to saistītas, plaša sfēra. Ir radies jaunu nekustamā īpašuma īpašnieku slānis, gan kā personīgā patēriņa sfērā, tā arī daudzās uzņēmējdarbības sfērās.

Operācijas un darījumi ar nekustamo īpašumu prasa īpašuma objekta vērtības zināšanu ar augsta līmeņa precizitāti un uzticamību. Nepieciešamība pēc novērtēšanas pakalpojumiem rodas, nosakot investēšanas efektivitāti ceļot mājokli, pērkot – pārdodot dzīvokļus un zemes gabalus, rekonstruējot ēkas (būves) u.t.t.

Iedzīvotāju nodrošinātība ar mājokli un mājokļu celtniecības attīstīšana ir viens no mūsu valsts svarīgākajiem uzdevumiem. Sekojoši, mājokļa vērtības noteikšanas jautājumiem ir aktuāla nozīme.

Īpašu aktualitāti nekustamā īpašuma novērtēšanas jautājumi ir guvuši pēdējā laikā, kad ir aktualizējies jautājums par mājokļa un cita fizisko personu nekustamā īpašuma tirgus vērtības noteikšanas metodiku ar nodokļu aprēķināšanas nolūkiem. Taču lielām būvniecības organizācijām – māju cēlājām nepieciešams zināt tāpat arī to, kādu peļņu sniegs viens vai otrs būvētais objekts.

Nekustamā īpašuma vērtība nav tieši saistīta ar tā celtniecības izdevumiem, bet tiek noteikta kā ienākumi naudas izteiksmē, kurus var sniegt dotais nekustamais īpašums. Sekojoši, nekustamā īpašuma vērtība var saistīties gan kā ar celtniecības izmaksām, tā arī ar paredzamo ienesīgumu, kā arī ar analoģiska īpašuma tirgus vērtību.

Visas celtniecības organizācijas darbības sfēras prasa atbilstošus prognozes aprēķinus un novērtējumus. Tādu novērtējumu un aprēķinu nolūks – ienākumu optimizācija, realizējot celtniecības ražotnes produkciju, nododot nekustamo īpašumu nomā, mainot to, u.t.t.

Lai pilnveidotu nekustamā īpašuma novērtēšanas metodes, nepieciešams izpētīt un prognozēt naudas plūsmas no celtniecības produkcijas realizācijas, izanalizēt investējamos līdzekļus celtniecībā.

Tirgus apstākļos nekustamā īpašuma vērtība ir atkarīga no ekonomikas faktoriem, tendencēm un izmaiņām sabiedrības dzīvē. Faktori, kas ietekmē vērtību, ir svarīgākais nosacījums pareizai brīvu tirgus funkcionēšanai.

Turpmākajā gaitā nekustamā īpašuma tirgus paliks arvien sarežģītāks. Radīsies jauni finanšu instrumenti, nodokļu aprēķināšanas kārtība, radīsies jaunas īpašumtiesību formas. Tā gaitā summai, kura tiks izmaksāta par īpašumu, būs arvien mazāka nozīme kā vērtības rādītājam. Investori pērk ne tikai nekustamo īpašumu, bet arī noteiktu ar to saistītu noteikumu klāstu. Sekojoši, tirgus vērtības noteikšanai ir nepieciešams izdarīt ievērojamas izmaiņas nekustamā īpašuma sākotnējā cenā. (Фридман Дж., 1995).

Vēl viena svarīga problēma dotajā sfērā ir novērtējuma automatizācija un nekustamā īpašuma vērtības noteikšanas programmkompleksu izveide. Bet tirgus infrastruktūras trūkums, lietotāju materiālā līmeņa neatbilstība jaunajiem tehniskajiem un programmlīdzekļiem u.c. izrāda noturošu ietekmi uz programmproduktu tirgus veidošanos celtniecības nozarē. Tāpēc galvenais uzdevums dotajā periodā ir celtniecības tirgus kompleksa piesātināšana ar jaunākajiem programmēšanas produktiem nekustamā īpašuma novērtējumam, kas domāti masveida lietotājiem. (Colwell, P.F., Dehring, C.A., Lash, N.A., 2000).

Lai paaugstinātu attīstības stratēģijas efektivitāti, nepieciešams skaidri nodalīt tiesības un pilnvaras firmas organizatoriskajā struktūrā, uzlabot lēmumu pieņemšanas procesu organizāciju, kuriem ir daudz lielāka ietekme uz rezultātiem, nekā pat stratēģiskajiem lēmumiem. Stratēģiskie lēmumi, kas saistīti tieši ar kapitālieguldījumu jautājumiem, normām un noteikumiem, ko nosaka ārējā vide, ir daudz konservatīvaki, salīdzinot ar taktiska rakstura vadības lēmumu pieņemšanas procesiem.

Stratēģiju izvēli ievada kapitālieguldījumu prognozes aprēķini celtniecības sfērā ne tikai konkrētā reģionā, bet arī visā valstī. Valsts ekonomiskās attīstības dinamikas tendenču analīze kapitālieguldījumu celtniecībā mērogā ļauj ņemt vērā iekšējo konjunktūru, izvēloties firmas attīstības stratēģiju. *Prognozējot kapitālieguldījumu mērogus,* var izmantot dažādas *metodes.*

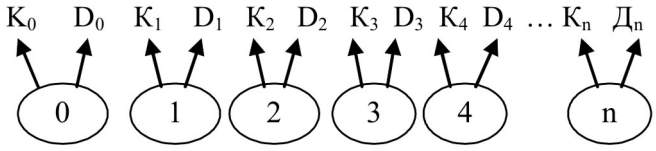
Paātrinājuma metode paredz, ka kapitālieguldījumu līmenis ir gala produkta izmaiņu rezultāts. Būtība ir sekojoša: ja ekonomikā ir zināms pieaugums vai paātrinājums, tad atbilstoši, pieaug prasības pēc apjomiem un intensivitātes kapitālieguldījumos. Kapitālieguldījumu apjomu pieaugums notiek ne uzreiz, kasir radies ekonomikas pieaugums, bet pēc neilga laika. Tā rezultātā radies laika solis tiek noteikts ar laiku, kurš nepieciešams, lai veiktu finansēšanas procesus.

Peļņas metode bāzējas uz kapitālieguldījumu efektivitātes uzskaiti, ko mēra peļņas rādītājs. Pie tam tiek aplūkoti divu analītisko metožu tipi, kuri apraksta atbilstošo finanšu resursu dinamiku un tīrās peļņas apjomus. (Генри С. Харрисон.,1994).

Trešās metodes pamatā – *pietuvinātības maksimālajai vērtībai*, ir objekta vērtības atkarība no kapitālieguldījumu apjomiem. Adekvātuma pakāpe variējas plašā diapazonā un tiek atklāta attiecinot prognozēšanas galīgos rezultātus vai nu savā starpā, vai ar faktiskajiem datiem. (Бирман Гарольд, Шмидт Саймур, 1997).

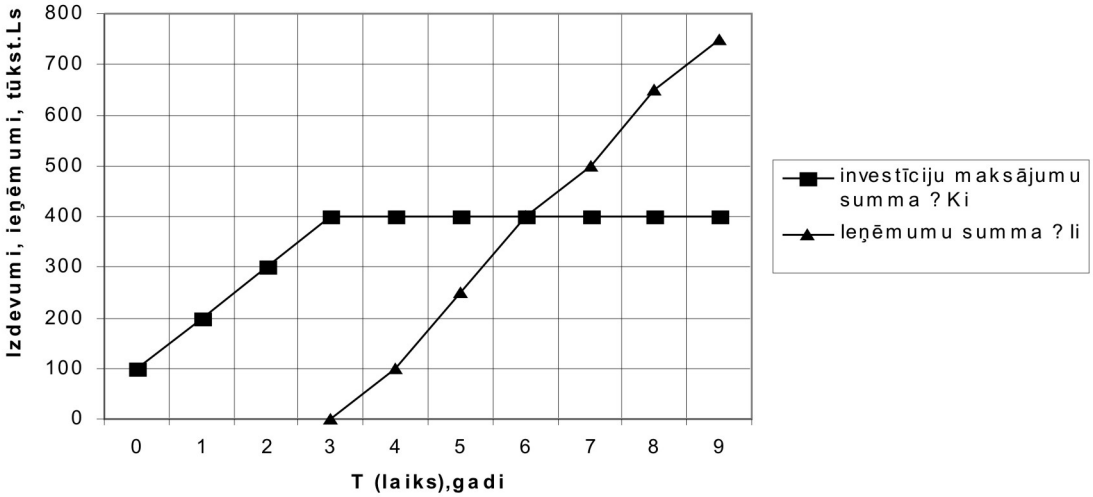
Svarīgākais uzdevums iekšfirmas plānošanā un vadībā ir pasūtījumu portfeļa formēšanas uzdevums. Šim uzdevumam ir divējāds raksturs, ko nosaka vismaz divu pušu dalība investīciju procesā: pasūtītāja un uzņēmēja. No vienas puses, uzdevuma risinājums tiek reducēts uz tādas celtniecības apakšuzņēmēja firmas meklējumiem, kura atbildīs pasūtītāja prasību virknei, tādām kā pēc iespējas minimālāka kontrakta summa, augsta varbūtība, ka projekts tiks izpildīts laikā un ar nepieciešamo kvalitātes līmeni u.c. No otras puses, apakšuzņēmēju celtniecības firmai ir noteikta objektu izvēles brīvība, kas garantē tai maksimālu peļņas gūšanu, vislielākajā mērā atbilst tās specializācijai, ražošanas jaudu teritoriālajam izvietojumam u.t.t. (Гитман Л., Джонк М.Д.,1997).

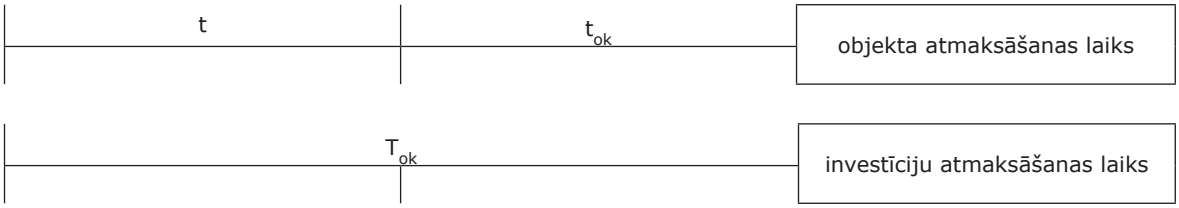
Nozīmējot kontrakta cenu, uzņēmējs riskē norādīt vērtību, kas izrādīsies lielāka, nekā citiem apakšuzņēmējiem – konkurentiem, kuri tāpat atsaucas uz piedāvājumu, kā rezultātā var rasties dotā apakšuzņēmēja priekšlikuma noraidījums no pasūtītāja puses.



Avots: Газеева Х., Смирнов П., Хрычёв Н. 1993.

1. attēls. **Projekta dzīves cikla shēma**
Figure1. **The scheme of the project life cycle**





Avots: Бирман Г., Шмидт С. 1997.

2.attēls. **Atmaksāšanas laika radītāju ekonomiskās nozīmes grafiskā izteiksme**
Figure2. **Graphic expression of economic sense for the repayment period indicators**

1.tabula
Table 1

Dati par ieņēmumiem un izdevumiem mājas celšanas rezultātā
Data on revenues and expenditure as a result of a house construction

Gadi	Investīcijas	Ieņēmumi
	K_0 = 100 tūkst.Ls	-
1	K_1 = 100 tūkst.Ls	-
2	K_2 = 100 tūkst.Ls	-
3	K_3 = 100 tūkst.Ls	-
4	-	I_4 = 125 tūkst.Ls
5	-	I_5 = 125 tūkst.Ls
6	-	I_6 = 125 tūkst.Ls
7	-	I_7 = 125 tūkst.Ls
8	-	I_8 = 125 tūkst.Ls

Tiešā ienākuma novērtēšana

Kā likums, veicot kapitālo celtniecību, vispirms notiek kapitāla iepludināšana, bet ienākumi sāk rasties tikai pēc celtniecības beigām. Dzīvojamā fonda objektus var ekspluatēt divos virzienos:

- nodošana nomā;
- uzbūvētā objekta realizācija.

Nododot objektu nomā, kā arī pārdodot to ar norēķinu ilgākā laikā, izdevumi atmaksājas ne uzreiz. Tāpēc izmantojam absolūtās efektivitātes (rentabilitātes) rādītāju, kurš raksturo projekta absolūto efektivitāti. Tās ekonomiskā būtība un aprēķina metode ir sekojoša. Pieņemsim, ka ir kapitālās celtniecības projekts, kura dzīves cikls sastāda noteiktu laika posmu (skat. 1.attēlu).

$$E_i = (D_i - K_i)/K_i \qquad (1);$$

kur:

K_i – investīcijas i-tajā gadā;

D_i – peļņa i-tajā gadā.

(Газеева М.Х., Смирнов А.П., Хрычёв А.Н.,1993).

Formula (1) nosaka ieguldījumu efektivitāti (E_i), zinot ienākumu un ieguldījumus. Ieguldījumu un ienākumu vērtības noteikt ir samērā vienkārši. Katrs celtniecības projekts paredz noteiktos posmos papildus naudas līdzekļu iesaistīšanu, pie zināma inflācijas līmeņa šī nozīme ir pilnīgi attaisnota. Ienākumus var noteikt ar analoģisku tirgus objektu funkcionēšanas analīzi (nomas maksa tirgū u.t.t.). Ja objektu tiek paredzēts nodot nomā, bez nomnieka izpirkuma, tad par D_i var būt D_3 un D_2, un pat D_{100}. Ir svarīgi, lai firma novērtētu priekš sevis, cik ilgā laikā tā vēlas atpirkt objektu.

Tālāk vērtības tiek ievietotas sekojošā formulā (2):

$$\sum_{i=0}^{n} \frac{D_i}{(1+P)^i} = \sum_{i=0}^{n} \frac{K_i}{(1+P)^i} \qquad (2);$$

kur:

n – laika intervālu skaits;

D_i – peļņas lielums i-tajā laika intervālā;

i – tekošā laika vienība (no 0 līdz n);

K_i – kapitālieguldījumu lielums i-tajā laika intervalā;

P – meklējamā iekšējā peļņas norma, raksturojoša projekta efektivitāti. (Газеева М.Х., Смирнов А.П., Хрычёв А.Н.,1993).

Vienkārša summu D un K starpība bez labošanas koeficienta parāda, kāds būs ienākumu apjoms, bet neņemot vērā laika faktoru. P – efektivitātes pazīme, ja P>0, tad projekts ir efektīvs.

Efektivitātes noteikšanas mērķis sastāv no tā, lai atrastu P vērtību, pie kuras iestājas vienādība augstākminētajā formulā.

Pastāv vēl viens ļoti svarīgs, bet atvasināts rādītājs: tīrie uzrādītie ienākumi (TUI). TUI rādītājs parāda projekta efektivitātes salīdzinošo novērtējumu. Salīdzināšana šeit sastāv no tā, ka ienākuma aprēķina rezultāti tiek salīdzināti ar normatīvajām vērtībām, t.i. firma iepriekš nosaka iekšējo ienesīguma normas normatīvu un iekšējās normas faktiskais rādītājs tiek salīdzināts ar normatīvo (3):

$$R=\sum_{i=0}^{n} \frac{D_i}{(1+\delta_n)} = \sum_{i=0}^{n} \frac{K_i}{(1+\delta_n)} \qquad (3);$$

kur:

δ_n – ienākumu iekšējās normas normatīvs.

Ja R>0, tad P> δ_n - projekts ir izdevīgs, jo lielāka starpība (P - δ_n) – jo augstāka projekta efektivitāte. (Бирман Гарольд, Шмидт Саймур, 1997).

Noteiksim δ_n (4). Saskaitāmajā $\delta_{garants}$ tiek atspoguļots garantētais ienākums un riska lielums no investīciju projekta lieluma.

$$\delta_n = \delta_{garants} + \delta_{riska} \qquad (4);$$

δ_{riska} ir atkarīgs no tā, vai tiek veikta apdrošināšana. Ja tiek veikta, tad ienākumu daļa samazināsies par par apdrošināšanas iemaksas (prēmijas) lielumu, bet δ_{riska} arī samazināsies. Pilnas apdrošināšanas gadījumā $\delta_{riska} = 0$.

Nākošais rādītājs: objekta investīciju atmaksāšanās laiks.

Ir svarīgi izvēlēties tādu projektu, pie kura patērēto resursu atmaksājamības termiņi būtu minimāli pie pietiekami augstas ienesīguma normas. Nepieciešams tāpat arī paskaidrot, ka visas augstākminētās formulas nosaka objektu, ienākumu, izdevumu apjomus uz ieguldījumu objektā sākumu, t.i. uz vienu punktu ar diskontēšanas procedūras palīdzību. Attēls 2 grafiski attēlo atmaksāšanās termiņu rādītāju ekonomisko nozīmi.

Objekta atmaksāšanās termiņa formula (5):

$$t_{ok}=T_{ok} - t, \qquad (5);$$

kur:

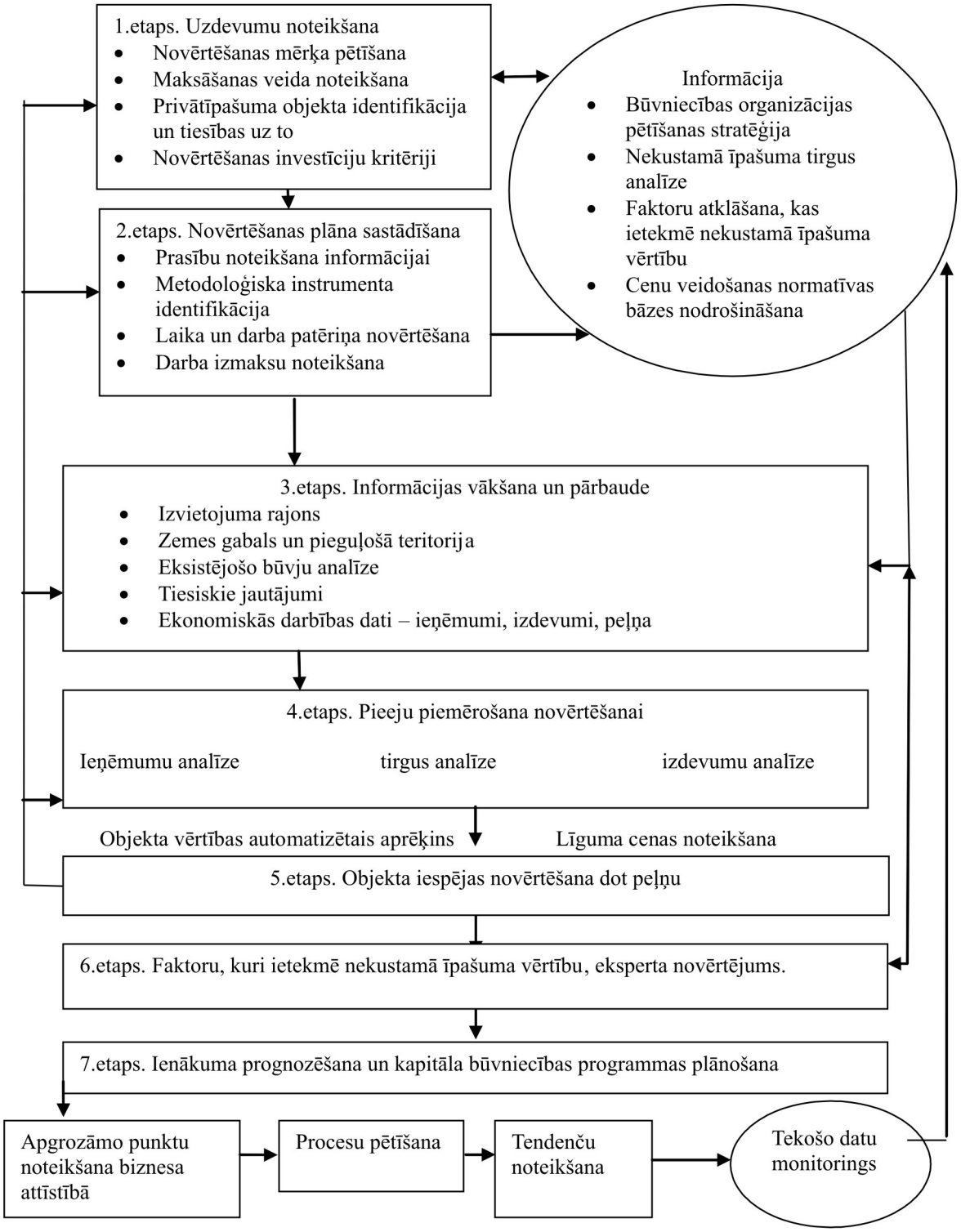
t_{ok} – objekta atmaksāšanās termiņš;

T_{ok} – investīciju atmaksāšanās termiņš;

t – laiks līdz objekta nodošanai ekspluatācijā.

(Газеева М.Х., Смирнов А.П., Хрычёв А.Н., 1993).

Investīciju atmaksāšanās tiek aplūkota uz 9 stāvu piecu sekciju dzīvojamā nama celtniecības piemēru (skat.1.tab.), pie inflācijas =0%.



Avots: ar autoru izveidots attēls pēc biznesa konsultantu grupas datiem (Nekustamā.., 2009).

3.attēls. **Nekustamā īpašuma novērtēšanas un investīciju plānošana kapitālajā būvniecībā, kompleksais modelis**

Figure3. **Quantitative model for real estate estimation and investment planning during capital construction**

Noteiksim investīciju objektā atmaksāšanās laiku.

T_{ok} vienāds ar sešiem gadiem un dažiem mēnešiem. Periodā no ceturtā līdz astotajam gadam, katru mēnesi tika gūti ienākumi pa 125 tūkst. Ls (skat. 2.attēlu). Beidzoties sestajam gadam tika gūta peļņa 375 tūkst. Ls. Periodā no sestā līdz septītajam gadam ienākumi 25 tūkst. Ls apjomā nozīmēja investīciju, kuras sastādīja 400 tūkst. Ls, atmaksāšanās termiņa iestāšanos. Ar proporcijas palīdzību aprēķināsim, kurā mēnesī tas notika:

$$\frac{125\ \text{tūkst.Ls}}{365\ \text{dienas}} = \frac{25\ \text{tūkst.Ls}}{x} \rightarrow X=73\ \text{dienas} \rightarrow X=2\text{mēn. }13\text{dienas}$$

X=73 dienas : 30 dienas, x=2 mēn.13 dienas;

T_{ok}k=6 gadi 2 mēneši 13 dienas; t=3 gadi;
t_{ok} = 3 gadi 2 mēneši 13 dienas.

Tādējādi, var aprēķināt, cik efektīvi bija ienākumi no dzīvojamā fonda objektu kapitālās celtniecības, nododot objektu nomā. Ar diskontēšanas operāciju palīdzību var noteikt objekta cenu uz realizācijas brīdi:

$$R = \left| \sum_{i=0}^{n} \left| R_i(1+E)^{n-1} \right| \right| \quad (6);$$

kur:

R – izdevumu un rezultātu samērojamības rezultējošais lielums objekta dzīves cikla periodā;

R_i – rezultējošais lielums priekš i-tā laika intervāla (mūsu piemērā tiek izmantota tikai analoģiska objekta cena tirgū);

E – diskontēšanas norma, inflācijas līmenis;

n – laika intervālu skaits objekta dzīves cikla laikā

(Газеева М.Х., Смирнов А.П., Хрычёв А.Н., 1993).

Dotā formula var tikt izmantota, lai noteiktu kapitālieguldījumus objektā dažādos celtniecības posmos. Aplūkojamie rādītāji var tikt efektīvi pielietoti dzīvojamo ēku celtniecībā.

3. attēlā var aplūkot nekustamā īpašuma objektu novērtēšanas un investīcijuplānošanu kapitālajā būvniecībā komplekso modeli.

Secinājumi, priekšlikumi, ieteikumi
Conclusions, proposals and recommendations

1. Tiek piedāvāts nekustamā īpašuma novērtēšanas un investīciju plānošana kapitālajā būvniecībā, kompleksais modelis.
2. Tiek izskatītas vairākas *metodes*, kuras tiek izmantotas kapitālieguldījumu mērogu prognozēšanas gadījumā (*paātrināšanas metode, peļņas metode, tuvošanās maksimālajai vērtībai utt.).*
3. Izdevumu un ienākumu laika gaitā grafiki, kuri ļauj noteikt objekta celtniecības investīciju atmaksāšanās termiņus, ir izveidoti un pārbaudīti praksē.
4. Dotajā periodā būtu nepieciešama celtniecības tirgus kompleksa piesātināšana ar jaunākajiem programmēšanas produktiem nekustamā īpašuma novērtējumam, kas domāti masveida lietotājiem, jo tirgus infrastruktūras trūkums, lietotāju materiālā līmeņa neatbilstība jaunajiem tehniskajiem un programmlīdzekļiem u.c. izrāda noturošuietekmi uz programmproduktu tirgus veidošanos celtniecības nozarē.

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Natural Resource Landscape and Methods of Its Economic Evaluation

Līga Vovere, Mg.oec.
Veronika Buģina, Dr.oec., professor
Department of Economics, Faculty of Economics, Latvia University of Agriculture

Abstract. The research aim is to appraise the methods for economic evaluation of landscapes and suggest their use in evaluating landscapes in Vidzeme region.
The research tasks associated with the set aim are the following: 1) to develop the theoretical basis of the study; 2) to carry out the analysis of landscape evaluation; 3) to appraise the evaluation of landscapes in Vidzeme region; and 4) to work out proposals for more precise economic evaluation in Vidzeme region.
Landscape is a heterogeneous area of land which is formed by an interacting body of ecosystems that is repeated in a similar pattern (Forman, Gordon, 1986). Each landscape area which is separated by features of natural factors or social functions has its own functions that can be described in different terms. Determining of functions of landscapes helps state the intensity of exploitation of landscape as well as the costs of exploitation. The evaluation of landscape is carried out in order to determine the value of landscape and various options for utilising the landscape (agriculture, building or recreation).
The evaluation of landscape has to provide a wide range of accurate information that can be used in territorial planning (Salice, K., Stephan, M.A., 2008). The aim of economic evaluation is to determine the monetary value an individual would be willing to pay for using a landscape. The nature of the evaluation is to offer different ways of selling the „goods" to ensure that the best possible option is chosen (Bateman I., 2002). In this case money is the main indicator for better use of a landscape, showing the public opinion on the use of a landscape, and it is also the means of compensation for any negative changes in a landscape. Money is a tool that drives even the development of a landscape.
Key words: landscape, landscape evaluation, landscape evaluation in Vidzeme region.

Introduction

Landscapes were historically formed by human actions and their current state and further development has to be viewed in the context with intensity of human actions in present. It is necessary to carry out landscape evaluation to acquire wide range information about landscapes and their economic importance in regional and agricultural development. Firstly, it is necessary to determine the functions of a landscape which will help determine the intensity, possible capacity, and costs of utilisation of a landscape. It is necessary to use direct and indirect research methods for information to be precise, comparable and employable in planning and managing processes of landscape exploration. Employing these methods will provide with a wide range of comparable information as well as public and professional opinions and also the necessary figures.

The research hypothesis: the economic valuation of landscapes in Vidzeme region requires the employment of a wide range of methods for information to be valid for the use in managing and planning a landscape.

The research aim is to carry out evaluation of methods for economic appraisal and draw up proposals for their use in landscape evaluation in Vidzeme region.

The research tasks associated with the set aim:

- to develop the theoretical basis of the theme;
- to analyse the methods of landscape evaluation;
- to analyse the landscape evaluation in Vidzeme region;
- to develop proposals for more precise economic landscape appraisal in Vidzeme region.

Vidzeme regional planning data as well as publications and special literature were used to carry out the tasks. The following methods were used in the research: abstract logical, monographic, document analysis, and methods of deduction and synthesis.

Results and discussion

Landscape is a heterogeneous area of land formed by interacting ecosystems that repeat in a similar pattern (Forman, Gordon, 1986). The structure of landscape consists of the following components: abiotic pattern (type of soil etc); abiotic processes (meteorological conditions etc); biotic processes (birth rate, mortality, interaction of species, primarily reproduction); and biotic pattern (number of organisms and their classification) (Wiens, Moss, 2005).

Landscape as territorial/spatial units

In continuity of landscapes it is possible to determine joint landscape units, landscape units that have borders in the nature and on maps, landscape units or landscape areas that are connected with

certain places (meaning that they are territorial) which emphasises spatial manifestation of landscape. Natural landscapes or geographical landscapes represent preconditions of natural circumstances to a further process of development of landscapes which human existence and activity has got already impact on. In connection with natural landscapes human activity is considered to be an extra factor that differentiates natural circumstances (Ainavu ekoloģiskās plānošanas....., 2004).

Functional landscapes are divided and separated by the main type of human activity that determines the structure and image of a landscape as well as a way of further use.

Visual landscape – its image determines interaction between the beauty spots and visual space although human individual perception, stereotypes and ideas of beauty in the nature have a great impact too (Ainavu ekoloģiskās plānošanas....., 2004).

Functional landscapes can be classified:

- primarily functional landscapes – if there is one long term way of using and managing land, together with weather conditions it has a direct impact on landscape which makes it a functional landscape. In accordance with this, there are the following landscapes in Latvia:
  - rural landscapes (agricultural landscapes);
  - forest landscapes (forestry);
  - urban landscapes (towns and villages).
- secondary functional landscapes – perception about landscape functionality changes, depending on how long the functional landscapes form and exist, changes of human, needs and values, or widening of circle of interest of the society. It leads to adding new functions to the existing ones (often with law enforcements) and those are called secondary functions such as:
  - nature reserves and historical territories;
  - transport corridor landscapes;
  - recreational landscapes (Ainavu ekoloģiskās plānošanas....., 2004).

Functions of landscapes

Every landscape territory, regardless whether it is separated by natural factors or social factors, has several functions:

- production (materials, energy, meeting needs of society);
- carrying function (territorial basis of activity, concentration of human made objects, natural diversity);
- information (landscape absorbs information about genetics and development of landscape, about processes, humans and historical events);
- regulatory function (special interaction among components of landscape or interaction between a landscape and centres of human activity) (Ainavu ekoloģiskās plānošanas....., 2004)

It is also essential to understand that landscape functionality has different effects:

- production (economic function);
- regulatory (ecological function);
- living space (social function) (Bastian, O., Schreiber, G., 1994).

Determining functionality of a landscape helps determine intensity, possible capacity and costs of utilising a landscape (Leser, H., Landschaftsökologie, 1997).

Landscape evaluation

Evaluation of landscapes is carried out in order to determinate their value and possible ways of exploitation (agricultural, building, or recreation). The evaluation has to provide with a wide range of precise information that can be used in territorial planning (Salice, K., Stephan, M. A., 2008). The aim of economic evaluation is to determine the monetary value that individual would be happy to pay for using a landscape. The idea is to offer different ways of selling "the goods" to provide a choice to find the most suitable (profitable) option (Bateman, 2002). Profit becomes an indicator that helps determine the best possible way to manage a landscape and also it shows the public opinion about the possible decision also, money is a means of compensation for any negative effects caused by utilising a landscape. Money is a tool that determines even development of a landscape (Hampicke, 2001).

Nature and landscapes are resources ("goods") that are running out. From an economic point of view, it is clear that the market value of utilising a landscape is not an important enough factor when decisions are made about utilising a landscape. Very often the economic valuation is carried out only in theory, which causes difficulties in practical application of economic methods: the frequency and ways of utilising a landscape have to be carried out practically not only left as calculations. Only when landscapes are precisely evaluated, decisions can be made about necessary standards of utilising and changes in landscapes (Elsasser, P., Meyerhoff, J., 2001).

Utilising landscapes is a way of getting economic benefits from ecological, aesthetic, and cultural environment. The demand for these goods is not a simple demand in a market – it has characteristics of social goods (Elsasser, P., Meyerhoff, J., 2001).

Over the past decades the landscapes all over the world have dramatically changed. Development of rural territories is characterised by opposite processes – on the one hand, decreasing agricultural activities and increasing attempts of conservation of a landscape, on the other hand – agricultural production. Both processes minimise traditional appeal of a landscape, and therefore development of methods of landscape evaluation become even more essential. Traditionally, the value of a landscape in a rural region is determined by agricultural production that is closely connected with using of natural resources and indicates a socio-economic situation in the region (Itziar De Aranzabal, María Fe Schmitz et al., 2008).

Use of economic methods in calculating the value of environment is connected with losses (or

effectiveness, demand and other market categories) (Vasiļjeva L., „Vides ekonomika", 2007).

Direct and indirect evaluation methods are used in landscape economic evaluation. *Indirect methods* allow gathering information about an individual's opinion and behaviour in a real situation. The idea of using these methods is that social benefit is analysed from the point of view of individual benefit. The complimentary principle is employed (Bateman, 2002).

Indirect methods include: replacement method, productivity or change in income method, hedonic method, and travel costs (Bateman, 2002).

The idea of the replacement method is payment for compensation of values – the cheapest replacement that can be considered as evaluation of gain from nature services. For example, the use of a Spa can be compared with building a swimming pool, providing with necessary services and medical staff. Productivity or changes in income method is used if natural resources are used in production. Any changes in consumption of resources affect productivity and thus income. This method is used to calculate the costs that arise from degradation of soil in a particular area or outside of it, erosion of soil, effect that air pollution has on forests etc. To use the method, the following information is necessary – data about changes in environment quality in physical units; and data about changes in the volume in production of goods (services). It is necessary to determine the involved costs, e.g. painting and market value of produced goods (services) (Vasiļjeva L., „Vides ekonomika", 2007).

The basis of hedonic method is quality of utilising natural resources that can be lost or gained by changing the circumstances of utilising the resources. The method of travel costs was first used in the USA in 1959. The aim of the method is to provide with information about a possible gain using specific areas. The main factor is recreation possibilities in a particular area by determining the benefits to customers when using the area. The method is used to evaluate the territories that need preservation, territories that can be used for hunting, camping, and general travel. The method can also be used when planning city parks and their economic evaluation (Vasiļjeva L., „Vides ekonomika", 2007).

Obviously there are several drawbacks of using methods of indirect evaluation. In order to gain more precise information, it is necessary to employ methods of direct evaluation. One of the most important methods of evaluating nature "goods" is contingent valuation method.

Contingent Valuation Method – CVM is a method to evaluate goods that cannot be sold, e.g. natural landscapes and services. It is a direct method where questionnaires are used (Elsasser, P., Meyerhoff, J., 2001). One of the methods is *Choice- experiment* method which, when classified more precisely, belongs to the group of Conjoint-Verifier methods. It is based on characterising goods (in this case landscapes) by important features. If one of these characteristics is price, it is possible to work out how many individuals are ready to pay for given services or goods. Landscapes provide the society with various services. To determine the price of services and to avoid losses several questions have to be answered: how much is the society willing to pay for possible services; how much society is willing to pay for changes in a landscape in an uninhabited territory; how much would spatial models cost; and have all the factors been taken into consideration (Schmitt, M., Roschewitz, A., Schläpfer, F., 2004).

The questionnaire to find out the public opinion is created, taking into consideration all the above aspects. The questions have to be correct and it is advisable to enclose ready proposals for utilising a landscape. When choosing the respondents, it is important that they are informed about the situation in a question (in this case a landscape). If it is necessary, the society has to be given all the necessary information beforehand. The results are summed up and data to be used in further landscape development processes and planning are gained using the method of mathematical statistics. This method is used in many European countries, e.g. Germany, Switzerland, the Netherlands etc.

The method of simulation is used to evaluate the landscape. It helps model structural changes in the territory in association with economic, social, and cultural changes. This understanding helps create different landscape models, the diversity of which is described by volume of agricultural production and physical specifics in a particular territory. The model created by Spanish researchers is considered to be an effective indicator of agricultural environment which onsists of figures that are necessary in evaluating a landscape as a natural resource (Itziar De Aranzabal, María Fe Schmitz et al., 2008).

The landscape evaluation has to be carried out systematically and therefore it is necessary to look at the experience of Italian researchers which suggests creating a monitoring system by employing the HCEA method that presents ability to analyse data describing a landscape for time period even longer than 100 years. The gathered data show what impact management of a territory has on the quality of landscape, thus warning about threats of degradation of cultural landscape. It also makes sure that the given method corresponds to the EU standards that regulate nature preservation and development of rural territories, including deforestation (Agnoletti M, 2007).

Landscape planning

It is important to find out anthropogenic impact on landscape when planning landscape development. It is essential to take into consideration the following criteria:

- territorial map – there have to be maps available from various years to find out what changes have taken place in an area in the past to be able to forecast changes in the future;
- zoning of landscape – it is important to determine whether there are special protection areas and whether human activity has a negative impact on it and the level of pollution;
- level of unaffectedness (Jansen, F., 2004).

A level of unaffectedness is calculated by a formula (1):

$$N = D_{T[0-6]} + D_{W[0-8]} + D_{s[0-4]} + D_{S1[0-2]} + D_{L[0-1]} + D_{W1[0-2]} + D_{W2[0-1]} + D_{K[0-1]} \quad (1)$$

where:

N – level of unaffectedness;
D_t – level of trophy [from 0 to 6];
D_w – water level [from 0 to 8];
D_s – changes in natural environment [from 0 to 4];
D_{s1} – level of acidity/alkalinity [from 0 to 2];
D_L – light factor [from 0 to1];
D_{W1} – water regime [from 0 to1];
D_{W2} – water quality [from 0 to 1];
D_K – cultivated plants [from 0 to 1] (Jansen, F., 2004).

Methods with multiple criteria can also be used in landscape planning.

- AHP (the Analytic Hierarchy Process) – to precisely organise work of experts and to process the results, it is highly advisable to use a method developed by American mathematician T. Saaty – The Analytic Hierarchy Process. It is a systematic procedure to hierarchic organisation of elements of any problem. The problem is divided step by step in more simple components (decomposition). Then experts compare these components in pairs and evaluate the intensity of interaction of these components in the hierarchy (synthesis). These conclusions are transformed into figures. The hierarchy of problem elements is formed beginning from the top – the aim which is followed by inter-levels where groups of criteria and criteria are found, and on the lowest level there are numerous alternatives. It is so called hierarchy of prevalence (Saaty, T.,L., 2000).
- SMART (Simple Multi Attribute Rating Technique);
- AWOT (AHP + SWOT);
- HERO (heuristic optimisation);
- ranging methods etc.

For example, a method used in the Netherlands in landscape planning and protection involves ethical, ecological, and economic evaluation, which means that there is determined aesthetical, ecological quality and quality of economic functionality (elasticity, multi-functionality). Three strategies are used in utilising a landscape:

- *cultural landscape strategy* (the aim is to provide modern multifunctional needs. Economic, aesthetical, and ecological values are equally important);
- *heritage landscape strategy* (the aim is to preserve or renew the visual appearance of a landscape as it was from 1850 to 1900. This strategy has emphasis on aesthetic and ecological qualities of a landscape. From the agricultural point of view, the economic functions are limited but it has a very high recreational and tourism value);
- *natural landscape strategy* (the aim is to renew natural processes in a landscape. The emphasis is on aesthetic and ecological values, agricultural activity is non-existent but the main emphasis is on recreation and tourism. The point of reference – before it was used by humans) (Panorama Europe, 2007.)

Landscape evaluation in Vidzeme planning region

Vidzeme Planning Agency when developing plans of Vidzeme regional planning territory for 2007-2027 has created a section in territorial planning "Landscapes of Vidzeme, their Evaluation and Description of Utilisation".

The group dealing with open space of Vidzeme planning region has suggested that a landscape in Vidzeme region should be perceived as:

- maintaining the biological diversity;
- developing tourism;
- attracting inhabitants to landscape territories;
- preserving and developing heritage values (Vidzemes attīstības aģentūra.., 2007).

There are 3 main structural types of landscape in Vidzeme planning region:

- ecological structure of landscape which is equivalent with a regional ecological network;
- heritage landscape structure – criteria, roads, population, and agricultural targets;
- aesthetic (visual) landscape with a target of developing the tourism in the area and preserving the lifestyle in scenic territories. Basic infrastructure and visual value of landscape are necessary for the development of tourism (Vidzemes attīstības aģentūra.., 2007).

Table 1 lists the criteria of visual/aesthetic evaluation of landscapes in Vidzeme region.

Table 1

Criteria for visual/aesthetic landscape evaluation in Vidzeme region

Criteria	Description
Visual landscape	Geographic position, landscape elements (relief, waters, forests, birch groves, roads, avenues, etc), originality – difference, cleanliness, land division (advisable evaluation of specialists and local population)
Impact on individual	Colours, relief, landscape diversity, water surface, structure of population
Accessibility	Roads, road surfaces, traffic intensity, aesthetic evaluation of accessibility (historical high road, bends, etc) distance (km) to regional towns
Discernibility	Description and distance of places of interest and views
Traditional rural building	Age of buildings, materials, quality, uniqueness, number of farmsteads their state – looked after or eyesore
Tourism potential	Allowed frequency of work (load) specification, characteristics of tourism, accessibility of information
Current popularity	Description of tourists (local, foreign), frequency of visits
Future value	Prognoses of who will find it important, necessity
Connection with other objects	Distance to objects of cultural heritage importance, natural objects, territories (big, old trees, rocks) places of worship (km and time)
Importance, impact	Current level of importance on locals, businesses, tourism etc. and importance in the future
Socio economic indicator	Population at the employment age, tourism businesses, businesses/farms (agricultural, services etc.)
Traditional way of using land	Ways and level of using land
Historic building	Type of buildings, age, solidity
Historical heritage	Churches, castles, manors, burial grounds (state, local importance, historical, architectural, and archaeological monuments) existing and planned Places of worship (trees, rocks), also engineering monuments (roads, windmills, etc)
Aesthetic value	Parks, ponds, avenues, plants, uniqueness – difference and tidiness
Possibilities of recreation	Traditional entertainment, place for organising entertainment

Source: Vidzemes attīstības aģentūra.., 2007

There were certain criteria that had to be taken into account when evaluating landscapes in Vidzeme region, which helped determine whether the task was carried out successfully or it had drawbacks. The data analysis provided the following outcome:

- all the above criteria when evaluating the landscape were used in none of the districts;
- almost every district has used its own criteria in evaluating landscapes, for example, Alūksne district has used the following criteria: *visual esthetical factors, panoramic places and perspectives, their characteristics, development of landscapes, current and perspective utilising of landscapes, degrading factors of landscapes, accessibility of landscapes, and visibility of landscapes;*
- methods of choosing the landscapes were also different – some districts evaluated all existing landscapes but, for example, Madona district has looked at landscape as a complete territory, whereas in Valmiera district each parish was looked at separately;
- evaluation in every district was carried out differently and does not give a complete idea of landscapes in Vidzeme region;
- although the criteria were described in detail, this description was not used in landscape evaluation;
- the evaluation has a descriptive character not analytical one, and it means that a description does not involve figures. For example, socio-economic indicators were not used at all which means that there is no information about the real situation in the territory as well, there is no information about business possibility in the landscape area;
- the authors think that the criteria are adequate and they have good use in evaluating landscapes;
- besides the authors think that landscapes in Vidzeme region should be re-evaluated as the current information is not complete and it cannot be used as comparable information to acquire accurate information, and thus it needs to be analysed once again for it to be valid and ready to use in

further regional planning and development processes.

On the whole, neither direct nor indirect methods were used when carrying out the landscape evaluation in Vidzeme region. An expert opinion was used but it does not provide complete information about landscapes and their potential in Vidzeme region. The authors think that it would be useful to use the following methods: substitution method, productivity or change in income, hedonic method, travel costs, and contingent valuation method. Also, when planning landscapes and evaluating them economically, the indicator of unaffectedness level should be used, which would provide the figures about: level of unaffectedness, level of trophy, water level, changes in natural environment, level of acidity/alkalinity, light factor, water regime, water quality, and cultivated plants.

The authors think that if carrying out essential planning and economically evaluating a landscape, there should be used various multicriteria planning methods: AHP (the Analytic Hierarchy Process), SMART (Simple Multi Attribute Rating Technique), AWOT (AHP+SWOT), HERO (heuristic optimization), ranging methods and others.

Conclusions

1. It is necessary to determine the function of a landscape to determine potential costs, intensity, and potential of utilising landscapes.
2. Economic evaluation of a landscape is carried out to determine the value of a landscape and the potential of utilising it. It has to provide the precise wide range information that can be used in further territory planning and development.
3. The aim of the economic evaluation method is to determine a monetary value what individuals would be happy to pay for using a landscape.
4. Evaluating landscapes economically, money becomes an indicator that shows the best way to use a landscape, public opinion on it, and means of compensation for negative effects of using a landscape.
5. Direct and indirect methods of evaluation and simulation are used to determine structural changes of a territory in connection with the changes in economic, social, and cultural processes.
6. Landscape evaluation has to be carried out systematically and thus it is useful to follow the example of Italian experts who suggest that a landscape monitoring system should be created using HCEA method that allows comparable data analysis for a period of more than 100 years.
7. An important indicator when economically evaluating a landscape is a level of unaffectedness, it is also essential to use multilevel planning methods (AHP – the Analytic Hierarchy Process), SMART (Simple Multi Attribute Ranging Technique), AWOT (AHP+SWOT), HERO (heuristic optimization), ranging method and other methods.
8. The existing evaluation of landscapes in Vidzeme region is not complete, and the data are not comparable. The united methods are not used in the evaluation process, for example, different territories use different criteria.
9. The evaluation has a descriptive not analytical nature; thus the description is not complete excluding important figures.
10. Direct and indirect evaluation methods were not used in the evaluation process in Vidzeme region. An expert opinion was taken into consideration but it does not provide the complete information about landscapes and their potential in Vidzeme region.

Proposals

1. It is necessary to re-evaluate landscapes in Vidzeme region, and to analyse newly acquired data for information to be comparable and employable in further development and planning processes to get complete information, since the existing information is not complete.
2. It is necessary to develop a method of economic valuation which would include the following methods: replacement method, productivity or changes in income, hedonic method, travel costs, and contingent valuation method to economically evaluate landscapes in Vidzeme region.
3. Besides when planning and economically evaluating landscapes, it is necessary to take into consideration landscape unaffectedness that provides the following figures: level of unaffectedness, level of trophy, water level, water level, changes in natural environment, level of acidity/alkalinity, light factor, water regime, water quality, and cultivated plants.
4. When planning and economically evaluating a landscape, it is necessary to use multicriteria panning methods: (AHP – the Analytic Hierarchy Process), SMART (Simple Multi Attribute Ranging Technique), AWOT (AHP+SWOT), HERO (heuristic optimisation), ranging method and other methods.

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Kopsavilkums

Zinātniskā raksta tēma ir „Dabas resurss ainavas un to ekonomiskā izvērtējuma metodes". Zinātniskā raksta mērķis ir: Izvērtēt ainavu ekonomiskās vērtēšanas metodes un dot priekšlikumus to izmantošanai, vērtējot Vidzemes reģiona ainavas.

Ainava ir heterogēna zemes platība, kuru veido mijiedarbojošos ekosistēmu kopums, kuras atkārtojas līdzīgā veidā. (Forman, Gordon,1986) Katrai no ainavu telpām – vai tā nodalīta tikai pēc dabas faktoru pazīmēm, vai arī pēc sociālo funkciju pazīmēm, piemīt vairākas citādos jēdzienos aprakstāmas funkcijas. Ainavas funkciju noteikšana palīdz noteikt ainavu izmantošanas intensitāti, iespējamo izmantošanas jaudu, kā arī ainavu izmantošanai nepieciešamo budžetu. Ainavas novērtējumu veic, lai noteiktu ainavas vērtības un tās izmantošanas iespējas (lauksaimniecībai, būvniecībai, rekreācijai vai atpūtas zonas izveidošanai). Ainavu novērtējumam jāsniedz plaša informācija, kas būtu precīza un tālāk izmantojama tālākai teritorijas plānošanai. (Salice, K., Stephan, M. A., 2008.) Ekonomikas vērtēšanas metodes mērķis ir noteikt ainavas vērtību naudas izteiksmē, ko indivīdi būtu vairāk nekā gatavs maksāt, par šīs ainavas izmantošanu. Koncepcijas pamatā ir piedāvāt dažādus „preces" pārdošanas variantus, lai pastāvētu izvēles iespēja atrast labāko (visizdevīgāko) variantu. (Bateman,.....,2002.) Nauda šajā gadījumā kļūst par rādītāju, ar kura palīdzību ir iespējams noteikt, kā labāk apsaimniekot ainavu, kāds ir sabiedrības viedoklis par iespējamo ainavas izmantošanu, kā arī, kā ar naudas palīdzību var kompensēt ainavas negatīvās izmaiņas. Nauda ir instruments, kas nodrošina vienmērīgu ainavas attīstību.

Ainavu ekonomiskajā vērtēšanā izmanto, gan tiešās, gan arī netiešās pētījumu metodes, tāpat tiek izmantota simulācijas metode, jo tā ļauj modelēt teritorijas struktūras izmaiņas asociējot tās ar ekonomiskās, sociālās un kultūras struktūras izmaiņām. Ainavu izvērtēšanai jānotiek sistemātiski un tāpēc ir lietderīgi aplūkot arī Itālijas pētnieku pieredzi, kura iesaka izveidot ainavu monitoringa sistēmu, izmantojot HCEA metodiku, kura sniedz iespēju veikt ainavu raksturojošo datu salīdzinošu analīzi pat par vairāk kā 100 gadu periodu. Būtisks rādītājs ekonomiski izvērtējot ainavas ir dabiskuma pakāpe, kā arī svarīgi ekonomiski izvērtējot ainavas

un plānojot tās ir izmantot daudzpakāpju plānošanas metodes (AHP hierarhiju analīzes metode; SMART (Simple multi attribute rating technique); AWOT (AHP + SWOT); HERO (heuristic optimization);Ranžēšanas metodes u.c.) Veiktais Vidzemes reģiona ainavu izvērtējums ir nepilnīgs un iegūtie dati nav salīdzināmi. Vērtēšanā nav izmantota vienota metodika, piemēram, atsevišķām teritorijām izvēlēti atšķirīgi kritēriji. Vērtējumam ir vairāk aprakstošs, ne kā analītisks vai vērtējošs saturs, līdz ar to izvēlētie kritēriji tiek aprakstīti tikai vispārīgi, neizmantojot reālus skaitļus. Kopumā vērtējot ainavu izvērtējumu Vidzemes reģionā jāatzīst, ka ne tiešās, ne netiešās pētījumu metodes ainavu izvērtēšanā nav pielietotas. Ir izmantots ekspertu viedoklis, kas sniedz nepilnīgu informāciju par ainavām un to bagātībām Vidzemes reģionā.

Pētījuma rezultātā, autori nonāca pie šādiem priekšlikumiem: Veikt Vidzemes reģiona ainavu izvērtējumu, jo esošā informācija nav pilnīga un savstarpēji salīdzināma līdz ar to, lai iegūtu informāciju par ainavām Vidzemes reģionā ir nepieciešams esošo informāciju vēlreiz analizēt un pārstrādāt, lai tā varētu būt izmantojama tālākam reģiona plānošanas un attīstības procesam. Lai ekonomiski izvērtētu Vidzemes reģiona ainavas, izstrādāt ainavu ekonomiskās izvērtēšana metodiku, kas ietvertu sekojošas metodes: aizvietošanas metode; produktivitātes jeb ieņēmumu izmaiņu metode; hedoniskā metode; ceļojumu izmaksu metode; konstruētā (hipotētiska) tirgus metode. ; Tāpat plānojot ainavas un ekonomiski tās izvērtējot, būtu jāizmanto tāds rādītājs, kā ainavas dabiskuma pakāpe, kas jau skaitliskā veidā atspoguļotu sekojošu informāciju: dabiskuma pakāpe; trofijas pakāpe; ūdens līmenis; izmaiņas dabiskajā vidē; skābes/bāzes līmenis gaismas faktors; ūdens režīms; ūdens kvalitāte; kultūraugi; Plānojot un ekonomiski izvērtējot ainavas pielietot arī vairākas daudzkritēriju plānošanas metodes: AHP hierarhiju analīzes metode; SMART (Simple multi attribute rating technique); AWOT (AHP + SWOT); HERO (heuristic optimization); Ranžēšanas metodes u.c.

Term Alternative Energy in the Context of Cyclical Use of Energy

Kaspars Naglis-Liepa, Mg. oec., PhD student
Faculty of Economics
Latvia University of Agriculture
kasparsnl@inbox.lv

Abstract. The paper is dedicated to the term alternative energy. Historically, the definition of the term alternative energy has had various interpretations. Presently, a view dominates that alternative energy is a synonym to renewable energy. The emphasis has changed in the understanding of the term alternative energy from the 20th century's prevailing economic dimension towards the dimension of preserving the natural environment, thus endangering sustainable economic development in general. The author has summarised several dominant and the most radical definitions of the term alternative energy by analysing their adequacy to the dominant context of sustainable development. It is proved that a cyclical use of energy exists. The paper deals with the change of types of energy in the contexts of technological development (K-cycles) and use of energy resources (Hubert's bell-shaped curve and other explanations of this fact) as well as the change of energy type, which is determined by an increase in efficiency of the energy resource. The reasons of a cyclical use of energy and the existing aspects of reality (increase in population and energy demand, anthropogenic nature of the greenhouse effect) enable us not to narrow the context of alternative energy to the dimension of natural environment, since it would imply the loss of economic sustainability. As a result, a definition developed by the author for the term alternative energy is presented, making a contribution to the discussion on this topic.
Key words: definition of alternative energy, energy cycles, Kondratieff cycles, Hubert's curve.

Introduction

Historically, a limited quantity of resources and their impact on the economic growth and the environment make us search for alternative solutions to supply an economy with energy resources, tending towards a more and more efficient use of these resources. A growing polemic on the increasing environmental problems narrows assessment criteria for alternative energies up to a full dominance of the environmental dimension, which is reflected in the definitions of alternative energy. The National Energy Development Model is based on a concept of sustainability, which has economic, environmental, and technological development determinants (Nakata, 2004). A too big emphasis on the environmental dimension might endanger the other ones, especially the economic development. After assessing few historical correlations between the use of energy and the development of society, it is possible to review the existing alternative definitions of energy, which would allow us to release this term from a short-term political point of view, and to use it in scientific discussions when analysing potential types of energy in the context of sustainable development. The aim of this paper is to summarise and analyse the definitions of the term alternative energy in the context of cyclical development.

The following research tasks are set forth:

1) to summarise and analyse the definitions of the term alternative energy;
2) to summarise the cyclical features of use of energy and their impact on the evolution of idea on the role of alternative energy;
3) to make a contribution by the author to the evolution of the term alternative energy.

Definitions and interpretations

The term alternative energy is widely used; however, there is no conformity of opinions on its definition. The term alternative energy is a uniting term which, depending on the period of time, takes different practical shapes. There is always some primary type of energy, which has gained the support of a majority of society as the most appropriate one for developing the life of society owing to its positive or negative qualities of use. Nevertheless, many alternatives exist along with the basic choice. By the end of the 19th century, for instance, a possibility to produce energy by means of wind was discovered; professor James Blyth from Anderson's College in Glasgow was Britain's first modern wind power pioneer; however, the use of wind for producing electrical power remained only as an option among other more efficient types of energy production. With science and technology developing freely, the existence of alternatives is unavoidable. Multipolar development of science ensures efficiency increase in using the types of energy that have lost their dominance and stimulates new fundamental discoveries, the practical significance of which is not yet clear, for instance, hydrogen energy (Milciuviene et al., 2006; Moriarty, Honnery, 2009).

The author has summarised several definitions of the term, which, in general, characterise the dominant interpretation of the term.

The Compact Oxford English Dictionary defines alternative energy as an energy that is produced in a way not exhausting natural resources or not damaging the natural environment (Compact Oxford English Dictionary).

A similar explanation is also given by Princeton University: it is an energy that is produced without exhausting natural resources or without damaging the natural environment (Princeton University, Word Net). The above-mentioned definitions emphasise a feature of the term in the context of its use – not to damage the natural environment. The definition – not to damage the natural environment and not to exhaust natural resources – can be quite widely interpreted, as any economic activity impacts the natural environment; fish resources are exhausted and the natural environment of fish is changed when producing hydroelectricity.

Other terms for the types of energy used in economic activity – renewable energy, fossil energy – are oriented, in their explanations, towards the characteristics of their origin or extraction, thus exposing the resources they are extracted from, while the term alternative energy is oriented towards the characteristics of its extraction and use. A different approach for giving a definition leads to a situation that the wide and unilateral interpretation of the term alternative energy is associated with other types of energy, thus the term alternative energy includes also the essence of renewable energy. The term alternative energy is an inclusive term within the context of these explanations; however, it is emphasised only in the context of its impact on the natural environment.

The Russian Academic Explanatory Dictionary gives the following explanation to the term sources of alternative energy: a way, a device or construction whose purpose is to produce electrical energy (or some other type of energy) and to replace traditional sources of energy, which are gained from oil, natural gas, or coal. The purpose of searching for alternative sources of energy is a need to get energy from renewable or in fact inexhaustible natural resources and phenomena, taking into consideration the ecological and economic aspects of these energy sources (Academic dictionaries and encyclopaedias). Although the definition explains not a type of energy, but a source for its extraction, it can be widely interpreted. The definition uses three different general terms simultaneously (Basic Principles for Developing Definitions of the Terminology Commission of Latvian Academy of Sciences) (a way, a device or construction), which says that any source of alternative energy is of anthropogenic nature with the purpose of producing energy. In accordance with the basic laws of physics regarding a constant quantity of energy and the First Law of Thermodynamics, energy cannot be created or annihilated; it can be transformed from one form to another. It is doubtful that a human being is capable of creating energy; therefore, a device for creating energy cannot also be designed. The definition also mentions the purpose of such energy – replacing the traditional types of energy. This purpose is also emphasised in the definition in the Energy Dictionary (Cutler, Christopher, 2006), describing the terms alternative energy and renewable energy as synonyms and the term's explanation is as follows: it is any system of energy, which is not the traditional oil, nuclear energy, and hydroelectricity that were a basis of industrial society for the past two centuries. All these explanations are correct, but several drawbacks are characteristic of them. They are very similar and mostly correspond to the term renewable sources of energy.

The given explanation distinguishes not only fossil sources of energy from alternative ones, but also includes hydroelectricity that sometimes (Explanatory Dictionary for Environmental Terms: Encyclopaedia Britannica) conforms to an explanation of renewable energy as well as nuclear energy which is not a source of gas emissions causing the greenhouse effect and is favoured by the EU Commission, and its impact on the surrounding environment and the nature is discussible. Such an explanation of the term does not give a complete answer on the essence of the term, as it has to be assumed that a complete replacement of any existing type of energy, just for the purpose of replacement, is useless. Therefore there has to be a reason making us reconsider the present way of producing energy. Most often, and in the above-mentioned explanations as well, the most distinctive feature and a basis for discussion on choosing a type of energy from the point of view of logic are a (relative) harmlessness of alternative energy to the natural environment. Their basic point is oriented towards replacing fossil sources of energy with renewable resources of energy. In this case, the requirement of preserving the natural environment is logical and characterises the goal of an idea on renewable sources of energy, i.e. not to exhaust natural resources in the widest sense of this idea, including the whole ecosystem. However, historically, the society made its choice after assessing several alternatives, for instance, firewood was replaced by coal in producing energy; resulting in the beginning of the First Industrial Revolution. Among these alternatives, the values of preserving the natural environment were not the determining ones, if analysed at all, and only economic needs were taken into account. Therefore, the term alternative energy is closely related to the determinants of values of societal development, allowing us to choose between economic, social, environmental gains and losses. Unequal distribution of natural resources and regional social and economic differences creates different criteria for choosing alternatives to meet demand for energy. The distribution of natural resources does not allow us to view alternative energies apart from a targeted region; therefore, the term's definition has to refer to the region and its socio-economic development context. Some factors, for example, the number of population, production efficiency, technological advancement, and innovation that impact the region's growth correlate with energy consumption and significantly impact the choices for alternative energy. The cycles of use of energy, which are related to technological advancement, increases in efficiency, and quantities of available resources, illustrate it very well.

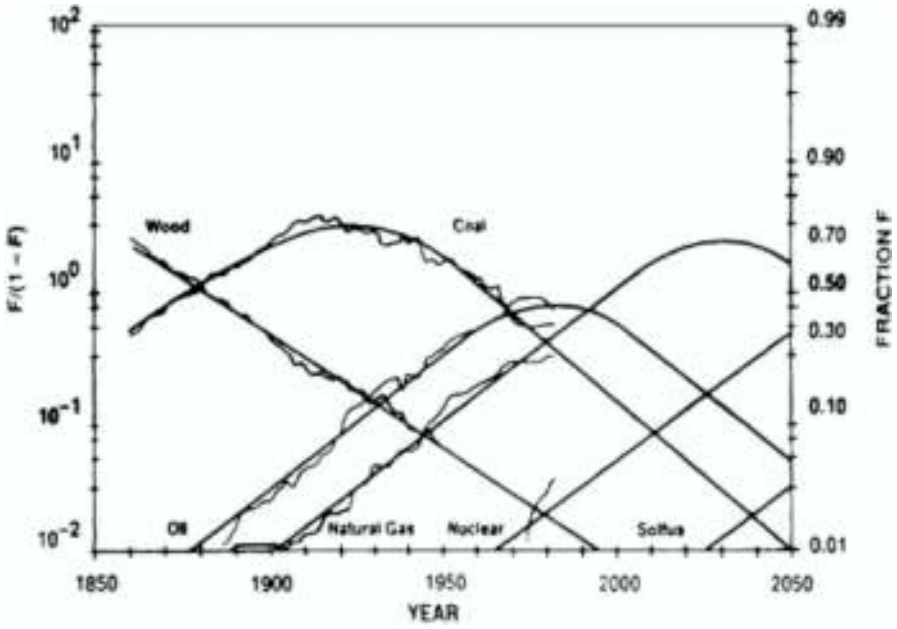
Cycles of use of energy

In the entire history of our mankind, any human being has depended on two aspects: an ability to adapt to circumstances and an ability to change these circumstances. If an ability to adapt to the circumstances can be regarded as a reactive activity, then an ability to change these circumstances is proactive, for example, crops that are adapted to wet soil can be chosen to be farmed if we assume that such a soil is available; otherwise, it is necessary to ensure the needed moisture by means of land amelioration. Reactive activities are less efficient for ensuring a high standard of living; however, they easier adapt to the planet's ecosystem and its time rhythm. The First Industrial Revolution convincingly shows the dominance of proactive activities of humans over reactive ones. In general, it allowed us to increase our lifespan, significantly improve the standard of living, and use political freedoms (Pryor, 2010); these are the results of industrialisation and capitalism. However, proactive activities have also negative consequences – the number of population and the quantity of resources consumed sharply increase (Krausmann et al., 2009). An ecosystem is a complex and not completely comprehended phenomenon of the planet; thus, with the increase in a proactive activity, its misbalance also rises, respectively, proactive activities cause also negative consequences (O'Hara, 2009), which require new activities to be performed, so that the negative consequences do not exceed the positive gains, at the same time, without giving up the gains of industrialisation. In the beginning of the 20th century, the overall development was determined by economic, social, and technological development (Jovane, et al., 2008).

A need of increasing the efficiency of economic activity made humans continuously search for alternative energies, admitting economic efficiency as the leading criterion. Any new economic cycle started with using a new source of energy or innovations in this field, which was one of the most significant factors of growth. Marchetti shows the correspondence of a primary source of energy to long term trends, which correlates with Kondartieff's long cycles (K-cycles).

Marchetti's analysis is based on the Fisher – Pry substitution model, historically viewing the shift of primary energy resources from firewood, coal, oil, and natural gas to nuclear energy (Devezas et al., 2008). Kondartieff's long cycles reflect a logarithmic shift of economic growth from the point of view of technological advancement or innovation. The cycles change each other by a substantial overlap, which enables several regions to reconsider their energy supply policies, and in general, the appearance of new cycles might be more frequent as a result of technological advancement, which could be explained by the fact that no energy source, which could take a position of the same kind as it was before with coal, is available from the point of view of public use. The change of energy type can be explained from this point of view as well. Georgescu-Roegen, one of the founders of the Energy Theory of Value, points out that innovations in the field of energy are determined by economic efficiency, simplicity of use, and capital intensity. This evolution marks a decrease in the factor of available reserves and an increase in the factor of flow regarding energy supply. He notes that as a result of society's evolution, the complexity of its existence increases and attention has to be paid to its responsibility for the consequences, calling it the entropic nature of an economy (Georgescu-Roegen, 1975).

There are various explanations for the change of dominant energy for another in a cycle. Reynolds views the historical change of the type of



Source: Devezas et al. 2008

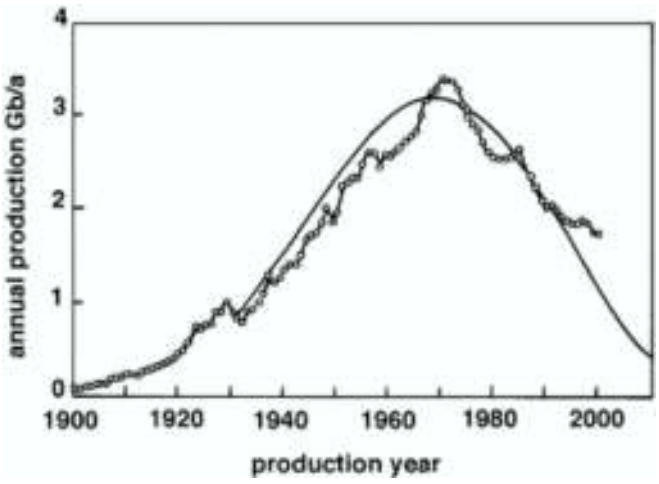
Figure 1. **Substitution dynamics of primary energy sources calculated by Marchetti**

energy in a similar way and uses the term energy grades. Economic growth, along with technological advancement, is ensured by a shift to a higher energy grade. Such a view is justified by a shift to a more efficient type of energy; weight grade, volume grade, area grade, and state grade are selected for criteria. The Energy Value Theory, which defines a shift to a cheaper energy, is disputed (Reynolds, viewed on 2 February 2010). An energy price as the leading determinant in choosing alternatives is disputed also by I.Matutinovich, an expert of Gfk Group – one of the largest research companies in the world. He points out that in the foreseeable future, a high price will not be the leading determinant setting energy production/export quantities according to foreign demand; domestic decisions will prevail over global, economic, and political decisions. He calls this phenomenon "resource pragmatism" (I.Matutinovich, 2009).

The cyclical use of energy sources can be viewed not only from the point of view of innovation, but also from the point of view of the possibilities of using mineral resources. There is no uniform opinion on the length of time period in which the current reserves of resources still are able to meet the demand for them, as the efficiency of producing and using them continuously increase and their estimation methodologies change. However, it is possible to apply simulative models to ascertain the need for alternative energy among the dominant energy resources. The 1972 Report of the Rome Club "Limit to Growth" started an active discussion on the impact of economic activity on environmental pollution, increase of population, and depletion of resources by applying a dynamic model (Turner, 2008). The introduction of a new environmental determinant that clears the way for a concept of sustainability will determine the type of alternative energy in the future. It has to be noted that Medov's model was not the first one that was able to define the ratios of resources needed for society. In scientific literature, Hubbert's model, which explains oil production and decreases in oil reserves, is often used. Hubbert's model differs from Medov's model which is logarithmically asymmetric with a steeper slope after its peak, whereas Hubbert's model has a symmetric bell-shaped form. Matutinovich, in his turn, points out that the slope of Hubbert's bell-shaped curve is shallower due to the above-mentioned "resource pragmatism".

Duncan's conclusions are more radical – he analyses consumption of primary (fossil) energy resources per capita and draws a conclusion that the industrial society is in the phase of decline. After analysing data on energy consumption per capita since 1930 and making a forecast till 2030, he obtained a logarithmic equation, a graphic depiction of which is similar to Hubbert's bell-shaped curve. The maximal energy consumption per capita was reached in 1979, and since 2012 this indicator decreases at a rate of 0.7% a year till the level of 1930 is reached in 2030 or sooner. Duncan is critical of governments of countries and international organisations for their weak capabilities of reacting on problems in a joint effort (Duncan, 2001). Duncan views energy supply as a closed system completely depending on fossil energy resources. No economic and social changes are assessed, for instance, the impact of innovation which, according to Marchetti, is able to restart the industrial society.

The cyclical use of energy, irrespective of whether it is determined by technological advancement, resource quantities, or change in society's paradigms, makes us reconsider primary types of energy and propose alternatives. From the historical point of view, the change of energy alternatives is obvious, and eventually, step by step, the efficiency of using them is selected as a criterion. The existing alternative energies start dominating as a result of technological advancement or innovation, which, in turn, determines economic growth in accordance with the Innovation Theory. From the point of view of a long term or Kondratieff's long cycles, limiting energy alternatives are not advisable, as technological advancement might make us reconsider some types of alternative energy like it



Source: reproduced with permission from Duncan, 2001

Figure 2. **Data on oil production in the lower 48 US states**

is, for example, with solar and wind energies. From the historical point of view when one type of energy is changed for a higher level energy, the change of the dominating type of energy for another is also observed, choosing its production and use efficiencies as the main characteristics. Such an analysis characterises a method according to which the types of alternative energy are analysed without making constraints on these types of energy as alternatives to be used. The use of any particular type of energy is limited in terms of its efficiency or quantity. This period is around 100 years long and, depending on a model, it is graphed in a more or less symmetric way. Therefore, when planning a region's development in a long term, it is necessary to propose potential types of energy without limiting the number of energy alternatives, as some type of alternative energy might make a combination of energies, which meets society's demand in a short or a long term. The lack of uniform opinion on a methodology for harmonising the aspects of sustainable growth with the current political, social, and technological possibilities by taking into account the difficult-to-assess environmental dimension leads to misbalance. At the same time, constraining the assessment of any particular type of alternative energy by political measures might lead to a misbalance of the whole sustainable development system.

Conclusions

1. The use of any type of energy is limited and cyclical. The cycles are determined by technological advancement, limited quantities of resources, and their impact on the environment. The change of the dominating type of energy for another takes place in accordance with the development model existing in a particular period of time, presently – sustainable development, and the technological possibilities.
2. The following explanation of the term alternative energy is developed by the author after summarising the discussion. Alternative energy is a way of producing energy, which is not a dominant one, and it includes the economic, social, and environmental gains and losses in a particular moment of technological advancement and in a particular region. Such an explanation of this term does not limit the choices of alternatives and is based on the dimensions of sustainable development.

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Legal Aspects for Extension of Renewable Resources Usage in Latvia

Jānis Leikučs, PhD student
Modrīte Pelše, Dr.oec.
Latvia University of Agriculture

Abstract. This review paper analyses the main results and conclusions of researchers and state institutions regarding the institutional environment of the business in Latvia. At the same time, the authors have paid attention to the institutional factor of business in regional dimension. The research aim is to find out the institutional problems regarding renewable resources in Latvia. The first part of the paper is theoretical and it proves the importance of institutional environment. The second part touches upon some of legal aspects related to the use of renewable resources usage. The analysis shows that institutional environment regarding renewable resources is ever changing and unstable, thus arousing reasonable suspicions for long-term investment availability in Latvia. The authors have also revealed several essential problems from renewable resources development point of view as well as in some institutional and legal aspects of renewable resource production.
Key words: institutions, renewable resources, legal aspects.

Introduction

Economic, political, geographical, institutional, legal, social, technological, and international aspects create the common business environment (Vedļa A., 2002; Abizāre V., 2004). Institutional competence of the state could be defined as the process of effective governmental decision-making process, the control over the implementation of decisions; besides it is the bureaucracy's ability of the public sector to formulate and to identify the effective and stable policies (Berijs F., 2006). This definition draws attention to the creation of such institutional systems which help promote developmental policies. It includes also the transparency and the elimination of corruption, the improvement of the state, and institutional performance of local government.

The research aim is to find out the institutional problems regarding renewable resources in Latvia. The following tasks are set: 1) to analyse theoretical aspects of the institutional environment; 2) to summarise Latvian and foreign researchers' reports of the institutional environment in business in Latvia; 3) to find out the main problems of institutional environment regarding the production of renewable resources. The monographic method is used to fulfil the tasks.

Institutions in a broader sense, are restrictions or rules created by the society, which influence people's mutual interaction (North D., 2003); in a very narrow aspect, they are organisations and institutions: financial organisations, insurance companies, stock markets, wholesales and retail traders, special service companies, education and qualification raising organisations, communication companies, etc.

The term "institutional environment" more commonly is used in the international economic literature and (Шаститко А. Е., 2002; North D., 2003) it emphasises the fact that the influence of institutions for business rises rapidly during fast changes in economies. Besides that, foreign researchers point to the fact that essential differences exist in institutional performance and effectiveness in the territorial aspect in every country. However, it must be agreed upon the fact that papers and textbooks of economics provided by Latvia's scientists do not show the consentient and consequent analytical interpretation of business environment (Vucāns J., Kozlinskis V., Vucāne A., 2007).

1. Institutional environment

Political and economic institutions define and influence economic activities and initiatives in the society (North D., 2003). It is a fact that these institutional qualities significantly determine the economic growth processes and their trends (Daron A., Aghion P., Zilibotti F., 2007). According to the terminology in new institutional economics papers, institutional environment is also the principal or general bunch of political, social, and legal rules which creates ground for production, exchange and distribution. Institutions are game rules for the society or more formally – created limitations which influence mutual interaction (North D., 2003).

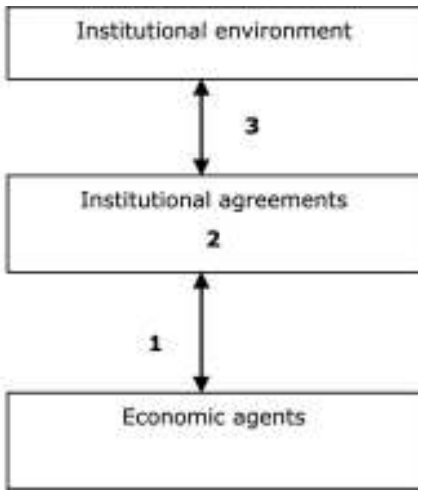
Institutional environment is often interpreted as the legislation's influence on business in Latvia. Economic textbooks in Latvian define institutional aspect of business more or less as legislation with close connections to public and private mediator firms (Vedļa A., 2002; Abizāre V., 2004). So, much closer analysis shows that in Latvian scientific literature the interpretation of business environment elements depends on the model PEST-*EL* (Political, Economic, Social, Technological, – Ecological, Legal) acknowledged in marketing and management. This model is one of many and allows characterising six

main business environment categories – politics, economics, social, technological, ecological and legal. Historically the model included only the first four mentioned categories, the last two appeared later and they can easily be included into the previous categories. F. Kotler, a prominent management researcher considers PEST model as useful instrument for the analysis of market growth, business situation, and evaluation of potentials. This analytical model together with Porter five force model and SWOT analysis can be used as framework for the evaluation of business environment in general (Porter M.E., 1985). Success in business depends also on the entrepreneur's ability to forecast and to understand changes in business environment in rural and urban territories, and the ability to adapt to these changes.

The above mentioned PEST model does not allow separating institutional category from other categories, and the model contains categories which are not understandable without fined interpretation of the term "institutions". It is easy to note that all the mentioned categories (political, economic, social, technological, ecological, and legal) run effectively only if there is effective institutional background. New institutional economics considers institutions as key factors in the economy, shows their connection with the growth and enormous influence in running any kind or type of economics. Promoters of these interpretations stress mutual interdependency between economic agents and institutions (Figure 1), contrary to the PEST model which considers the firms as passive agents regarding business environment.

There are three levels which are connected with three types of bonds (Figure 1). The first level encompasses agents, the second – institutional agreements between market, firms, and agents; while the third – institutional environment which consists of general rules controlling institutional agreements as well as mutual interactions between economic agents. However, these bonds are not passive. The first type of bond is "prerequisites of action". New institutional economics (NIE) take here rational choice model as the beginning point (contrary to the old institutional economics which severely criticises this assumption). However, economic agents are influenced by agreements and environment, restricting their 'rational' choice scope. The second bond is about institutional agreements and their mutual interconnectedness. It is important to speak here about changes in market thanks to the firms' and organisations' activities, and otherwise – the market impact on firms' performance. So, the institutional arrangement is also the result of the mutual agreements between economic agents, and not only the restricting factor of their activities. The third type of bond characterises the basic parameters of institutional environment, for example pricing, tax system, antimonopoly or custom duties, new firms licensing etc. Changes in these parameters affect the efficiency of institutional agreements. They create modifications in transaction structure thanks to the modified institutional arrangements. In other words, tax reduction in stable tax system creates stimulus for more active legal market transactions. This impact is indirect, since there are changes in resource usage for sustaining already existing institutions and resource allocations for the new ones – the so-called transformation costs. However, changes in institutional environment in this case are considered exogenous.

European Reconstruction and Development Bank experts in "*Transition report*" analyse institutional constraints regarding running business in the Eastern European countries. These reports are published each year and are considered as the main analytical document showing progress or stagnation of business environment in these countries, including Latvia. Despite general agreement that business environment in the transition countries and regions has improved; there are a lot of radical differences between them. The researchers of ERDB in the latest report have stated that high costs of creating new business and



Source: Шаститко А., 2002

Figure 1. **Research levels and bonds between them in the new institutional economics**

their control costs, weak institutional environment, and unstable macro economic environment due to frequent changes in policies are the main obstacles for business successful development in Latvia (ERDB, 2009).

Annual reports of the World Bank evaluate business environment in Latvia as good (Doing Business, 2010) and range it on the 27th place (in 2008 – 30th rank). In 2009 total costs for starting new business in Latvia equalled to 2.1% of per capita income; while in OECD countries they were 4.7% (twice higher than in Latvia). The average amount of procedures and time for starting new business in Latvia are almost the same as in the OECD countries.

Wendy Carlin, Mark E. Schaffer, and Paul Seabright (2006) have studied the quality of institutional dimensions which directly influences firms' performance, and stated that weak regulations (negative business practice) and their discrepancies with legal system influenced firm's performance. They have also stated that private sector and not the public one gains more from the macro economic stability, predictable political and legal system, and corruption and crime reduction.

Latvian researchers interpreted business environment as the impact of administrative procedures on business (Ziņojums par pētījumu, 2005; LIAA, 2006; Aksedo, 2008). The latest important research on this matter more or less is a pre-crisis evaluation of business environment, and some of constraints (for example, inflation was the greatest constraint in 2007) are no more important in 2009 (Aksedo, 2008). Also other constraints of business environment in 2007 are noteworthy, for example creation of the taxation in 71% cases; frequent changes in legislation in 58.9%, and poor administration of taxies and tax laws in 50.3% cases are cumbersome for the entrepreneurs (Aksedo, 2008). The authors were interested to find out also the opinion of entrepreneurs on institutions' performance impact on the firms operation results in the above mentioned research. In general, the authors stated that entrepreneurs' opinions have become more radical, especially after accession to the EU. In general entrepreneurs have evaluated the support of Latvia's government for business development negatively. The fact that surveyed entrepreneurs took a poor view of state support is supported also in other researches (Ziņojums par pētījumu, 2005; LIAA, 2006).

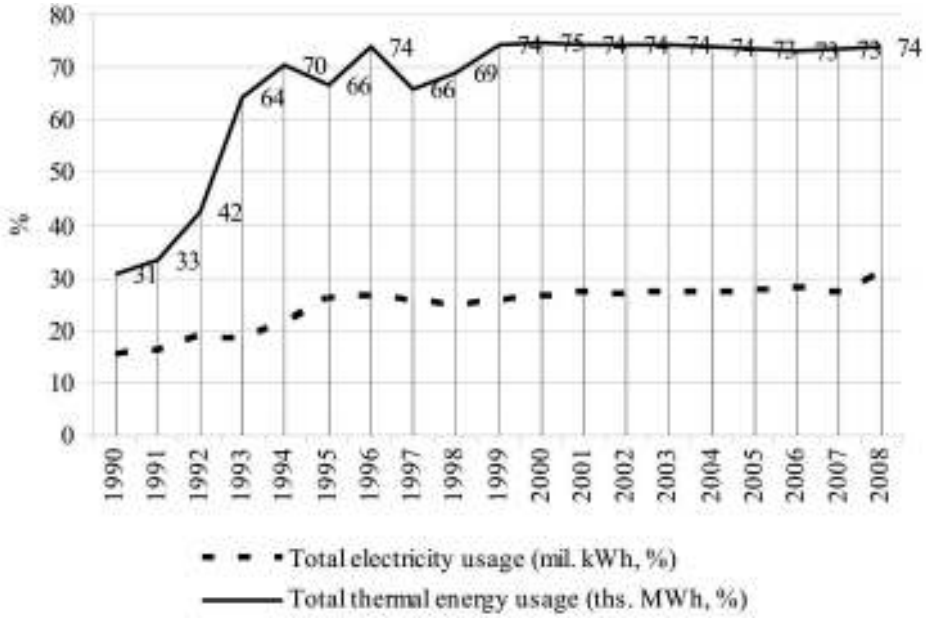
The research results of Aksedo (2008) show that 21.1% of surveyed entrepreneurs hold a view that the state does not promote the development of entrepreneurship; yet rural entrepreneurs had a more negative opinion about institutional support of the state. In the preceding research the authors also established the fact that there are sharp differences in entrepreneurs' opinions in regional aspect, especially regarding the state and local governments' institutional support and attitude of those institutions towards business. Especially big differences in opinions exist between entrepreneurs from Riga planning region and other planning regions. For instance, entrepreneurs of Riga region evaluated the involvement of civil servants in solving problems as very bad contrary to the majority of entrepreneurs from Latgale region ("good" and "very good"). Entrepreneurs in Latgale evaluated the usefulness of state's institutions supplied information much higher than entrepreneurs in other regions (Aksedo, 2008). In general entrepreneurs in production and industry sectors felt the increase in the number of administrative procedures after the EU accession (52.2% of surveyed entrepreneurs). The opinion that many administrative procedures have very inhibiting effect for running business is shared by 38.1% of surveyed entrepreneurs. Compared with the two years old research there is an increase of entrepreneurs who believe that the performance quality of local government institutions has lowered (Aksedo, 2008).

An important conclusion found in the other research regarding alternative energy production and usage in Latvia is that "frequent changes in policies and short time periods of the valid system of guarantied purchasing prices lead to the uncertainty in long term investments" (Blumberga, 2009).

Transaction costs are one of the main indicators in new institutional economic theory. These costs illustrate the global picture of the business environment in the country and show the tremendous impact of the intermediaries on running business. Wallis J.J., North D.C (1987) are one of the first scientists who evaluated transaction costs in macroeconomics of the USA during the last 50 years. They stated that transaction costs have increased. Wallis J.J., and North D.C (1987) also in their research have defined four types of relationship which create transaction costs:

1) relationships between buyers and sellers;
2) agreements in firm;
3) different types of intermediaries who sell their services to the firm;
4) protection' agreements regarding private properties.

This list testifies that transaction costs are everywhere where there are mutual interactions between economic agents. Valid legal system and normative enactments define the distribution of transaction costs between economic agents. These transaction costs on free markets conditions are almost identical to the taxes regardless the stability of tax system (Wallis J.J., North D.C 1987). Taxes are payments to the state; they also include protection of the private property and become a part of transaction costs for taxpayers. So, if the transaction costs are zero (as it is assumed in neoclassical economics), then there is no sense to study them. However, if transaction costs exist, they allow understanding more deeply the impact of institutional arrangements and their changes. Aleksander S. and P. Graca. (2005) replicated the mentioned research in Poland. They analysed transaction costs on macro level and also stated a question on possibilities for calculation of transaction costs on the sectored level, for example in primary energy production.



Source: LR CSP, 2010.

Figure 2. **The share of households in total energy consumption for the period of 1990-2008 in Latvia**

The authors of this paper have also evaluated the opportunities for calculation of transaction costs in Latvia and stated that it could be done; however great difficulties affected the research, since the data were not comparable with previous years due to the recently finished territorial and institutional reforms.

2. Legal aspects of renewable resource usage in Latvia

"Energy Development Guidelines 2007-2016" (2006) determine the policy of renewable resources in Latvia. The Ministry of Economics has elaborated this policy document, however only the Ministry of Environment is responsible for creating planning documents of renewable resources and implementation of these documents. The Ministry of Finance in turn supervises and controls the financial investments of the EU and Latvia in this field. The authors suggest that such institutional division creates additional difficulties for business, due to poor coordination between these institutions, especially within the last few years. Poor coordination between and rapid changes in policies within these institutions create non-transparency of important agreements and opportunities for the shadow economics in renewable resources production. The *Energy law* (1998) supports renewable resources production and prescribes that the Regulator (Public Utilities Commission, established in 2001) shall promote local and renewable resource usage in energy production (*Enerģētikas likums*, 1998, Section 84). The Regulator influences production of electricity and heat based on renewable resources on local level. *Electricity Market Law* (2005) is also important in the sector after its serious elaboration in 2008.

The state support is defined also in Natural Resources Tax Law (2005) which determines that users of renewable resources are free of natural resources taxes and CO_2 tax payments. The *Law on Control of Aid for Commercial Activity* (2002) prescribes that producers of energy from renewable resources may recover back up to 40% of invested resources. The state can also compensate the difference between production costs and sales prices of energy which is produced based on renewable resources.

Despite legal and institutional support in this field, some of researchers state that there are gaps between the norms and legislation; as a result they do not promote production and usage of renewable resources (E&IC, 2009). The current experience shows that political support documents are created for many years but in practice renewable resources production faces many constraints and even resistance (Dzene I., Rošā M., 2008).

The authors also want to point to the fact that the main EU directives and normative documents regarding renewable resources production have two main streamlines. The first one is the expansion of electricity production and the second one – traditional fuel usage replacement with bio-fuel. Overall there is a strong desire in the EU to decrease the dependency from any energy import. However, here are disagreements between experts regarding usefulness of these EU normative documents in Latvia, because the Central Statistical Bureau data of the Republic of Latvia show that households use more than 70% of all thermal energy (LR CSP 2010; Figure 2). It means that much more attention should be paid to the thermal energy production not the electricity which is supported in the main

Table 1

Distribution of power plants with renewable resource usage and the state's purchased power in Latvia in 2009

Region	Number	Type of power plant	Total power, MW	Compulsory purchased energy amount per year (total), MW	% of amount (biogas)	% of amount (biomass)
Kurzeme	22	Biogas	16.0	123736	38.57	-
Latgale	4	Biogas	1.4	18484	5.76	-
	3	Biomass	1.3	10200	-	5.51
Zemgale	12	Biogas	5.0	47728	14.88	-
	12	Biomass	10.3	84189	-	45.54
Vidzeme	11	Biogas	4.4	62360	19.43	-
	3	Biomass	3.8	26328	-	14.24
Riga	10	Biogas	7.7	68491	21.35	-
	10	Biomass	8.4	64160	-	34.70
Total purchased quantity of energy produced from biogas, MW				320799	100	-
Total purchased quantity of energy produced from biomass, MW				184877	-	100

Source: authors' calculations according to the data of the Ministry of Economics, Republic of Latvia, 2009

EU directives and normative documents regarding renewable resource production.

The system of purchased prices was introduced to promote production of electricity from biomass (the amounts purchased in 2009 are shown in Table 1). There are several institutional support instruments – the Ministry of Agriculture offer to co-finance projects of biomass production which are provided for electricity production; the Ministry of Economics supervise the EU financial support and co-finance projects in which the produced biomass is used for electricity production, and the Ministry of Environment supports renewable resource production with the so-called "Scheme of Green Investments". All these instruments comprise the promotion of biomass usage, including the usage of biomass in cogeneration stations, the production of biogas and its usage as well as the promotion of biofuel usage.

The data show that biogas electricity power plants in Kurzeme region have the largest share of working biogas power plant number in Latvia (Table 1). However, the imperfection of procurement procedures of renewable resources allow one businessman having ten companies (all of them are located in the same legal address and have the same technical specifications of biogas production) to get the majority of available quotas for biogas production in the state. The verification of such dubious case was not made, so it is detrimental for other renewable resource producers and in general could impede the biogas production in other territories (LETA, 2009). One of the reasons for such spoofs is the extremely high purchase price for biogas (in 2009 – 19 cents/m^3). The government avoided dealing the situation directly, but instead it increased the total number of renewable resources purchase quotas. Despite this there is an obvious and big territorial disproportion in production of renewable resources, for example the majority of electricity power plants using biomass are located in Zemgale region (Table 1).

The rate of VAT on fuel from renewable resources has been changed twice in 2009 compared with the rate of VAT on natural gas. The VAT was fixed at 21% rate like other fossil fuels; while VAT on natural gas remained only 10% without any changes. The application of the new VAT on fuel from renewable resources stopped the usage of fuel in individual households and local heat supply systems. It also inhibited the usage of fuel from renewable resource in central heat supply systems of local governments. At the current moment this error is corrected; however the gained impression – distrust of the society and entrepreneurs in the support policies and institutions – remains high.

In general, different and even controversial opinions characterise the role of tariff. It is worth mentioning that the auction of compulsory procurement quotas created three negative effects from a long-term perspective:

1) the provided support (state and the EU) is directed towards the production of electricity but not the heat supply; it created situation in which the electricity production is the primary target and the heat supply is considered as some extra earning resource; this logically leads to higher prices of electricity;
2) the existence of double support – one support programme for purchase tariff and another one for production equipment;

3) one of renewable resource production type is evaluated much higher, regardless its usefulness (E&IC, 2009).

At the moment the support of renewable resources production and consumption in Latvia implies two essentially different things. The analysis shows that the state support is directed towards reconstruction of the central heat supply systems and improvement of cogeneration stations which distribute heat in heat supply systems of local governments. The use of fuel from renewable resources instead of the fossil fuel in local heat supply systems is not sufficiently stimulated.

The support of renewable resources production (responsibility of the Ministry of Agriculture) mainly covers the purchase of chip crusher and granule production equipment which is not enough. The experts share opinion that there is no need of the government's procurement quotas for electricity production from biogas. It did not help achieve the stated aims but only created additional economic and political problems (E&IC, 2009).

The legislator initially accepted dual system of public utilities regulation in Latvia – the first regulator on the national level and the second one - on local governmental level. As the law "*On Regulators of Public Utilities*" came into force (2000) several serious institutional problems appeared:

1) regulation in heat supply and cogeneration simultaneously has two regulators (state and local governments) with different approaches in the regulation process and thus entangling the situation for producers;
2) different methodological approach in applying normative documents in local government regulated sectors;
3) the financial insufficiency of regulators in local governments; many local governments did not have the regulator institution as such at all, thus violating the law; as a result the public support for renewable resource production, and the regulation of public utilities in many local governments was not sufficient or did not exist at all.

Therefore the government it the second half of 2009 decided to remove all regulators institutions on the local government level. Since November 1, 2009 all public utilities regulations are under the Commission of Public Utilities Regulations. In many aspects it will make a little bit more predictable the future for the usage of renewable resources. Besides it solves some issues connected with accomplishment of the Administrative territorial reform in summer of 2009.

Conclusions

1. The analysed researches show that there exist differences in opinions of entrepreneurs in different regions regarding state and local governments' institutional attitude and support of business. There are differences in opinions about institutional environment in Latvia; entrepreneurs in Riga region have the worst opinion on business environment.
2. The researchers in Latvia and also foreign researchers have stated that the main problems are relatively high business starting costs as well as high business control costs, weak institutional environment and unstable macro economic environment. Despite these problems, the business environment in Latvia gets better in comparison with the previous years. It is good news for entrepreneurs involved in renewable resource production.
3. The calculation of transaction costs in power sector, and also on regional level would be possible; however, access to the necessary data is troublesome not only because of time but also due to unavailability of many data in territorial aspect.
4. The laws and regulations in force regarding renewable resource production and usage are unrelated or have weak interconnectedness. The need of renewable resource production support programme on the national level is still unfulfilled.
5. In the current situation the fulfilment of the goals set in the plans of renewable resource production expansion is nearly impossible due to the absence of competition in this branch, the unbalanced support instruments and current economic recession. The support instruments have lack of uniformity; their normative and institutional background is more obstructive than coefficient.
6. The attention in promotion of renewable resource production should be drawn to heat production which is more acute for Latvia's climate, despite this the government and the EU support to electricity production. Potential users could be individual households and local heat systems in local governments.

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Impact of Laws and Regulations on Mutual Settlement Model between Thermal Energy Producing Enterprises and Consumers and Suppliers

Artis Broņka
Mg.oec., PhD student, Faculty of Economics, Latvia University of Agriculture
Andra Zvirbule-Bērziņa
Dr. oec., asoc.prof. Faculty of Economics, Latvia University of Agriculture

Abstract. The European Union has requested from Latvia to submit the predefined climate and power industry objectives till 2020. It is important for Latvia to primarily increase power efficiency of consumers and to expand the usage of renewable energy resources in order to increase the amount of renewable energy resources in total power consumption from 36% to 42% and to decrease the emission of CO_2. The most efficient way to accomplish the objectives is heat insulation of buildings, yet it has slowed down due to building management issues and lack of financial resources. Moreover, the possibility to increase power efficiency from the position of a thermal energy produce-supply enterprise is limited by the system of settlements between power suppliers and consumers. For monthly used thermal energy consumers are allowed to pay by the end of the next month, but for natural gas thermal energy producer has to pay in the current month (once in 10 days). This system of settlements is in conflict with business conception, thereby violating the derivation of profit principle. Furthermore, activities of thermal power producers are limited by the system of settlements model variations set by laws and regulations. In standard situations building management should make payments for consumed thermal energy, but in reality this situation is different – consumers are the ones who make payments. Therefore, thermal energy producers encounter huge accounts receivable, which should be reflected in the balance sheet of building management. Reorganising the system of settlements and increasing wood biomass usage allows heat supply businessmen to decrease accounts payable and to increase energy efficiency in thermal energy production as well as heat supply administration.
Key words: power industry, heat supply, energy resources, energy efficiency.

Introduction

The European Union laws and regulations on climate and power sector substantially affect Latvian economy as well as other EU member states economies and industries. The report of International Association for Energy Economics (year 2008) has emphasised that 60% of greenhouse effect causing gases are emitted during energy production process. In 2008 the EU member states authorised a long-term climate and power sector strategy that defines the decrease in CO_2 emission to reduce environmental pollution. The European Union has set the targets which should be achieved until 2020:

- to increase the proportion of renewable energy resources in total energy consumption by 20%;
- to increase energy efficiency by 20%;
- to decrease the emission of gases causing greenhouse effect by 20% compared with the year 1990.

For Latvia it means to increase the proportion of renewable energy resources in total energy consumption to 42%, which is by 7% more than currently (Piebalgs A., 2008).

Researchers from the Faculty of Environmental Protection and Thermal System, Riga Technical University have analysed the subsisting situation at the end of 2008 and concluded that targets can be reached by increasing energy efficiency of energy users and stimulating the usage of renewable energy resources (Gan ražot…, 2009).

In Latvia centralised heat supply compiles approximately 70%, using more than 1/3 of the annual energy resource consumption in Latvia to produce thermal energy, therefore the greatest energy efficiency potential is thermal energy sector:

- consumption (on average compiles 2/3 of household utility payments) – the Soviet time buildings in Latvia consume 220 KWh/m^2 on average, however in Sweden and Germany the average indicator is 120 KWh/m^2, thus it could be possible to save from 60% to 80% by heat insulating buildings (upgrading exterior constructions, as 20% of heat flows away through the roof, 20% – through ventilation, 18% – through windows, 20% – through walls, and 5% – through the substructure) (Lonska I., 2007., Akermanis A., 2008., Energoauditu rezultāti … 2009);
- supply – Latvia produces approximately 9000 GWh per year and centralised thermal energy consumption is approximately 7000 GWh. According to the sectors specifics the 15% loss limit is considered as the lowest, thus annual loss is approximately 1350 GWh, hence the increase in energy efficiency would save 3-5% of the present losses (Brizga J., 2007);
- thermal energy production – many of heat supply enterprises have undertaken all preconditions to increase energy efficiency requirements (at the current type of energy resource). New energy

efficiency possibilities are derived, at a thermal energy producer's viewpoint, by changing thermal energy sources and conversion to cogeneration (Latvijas siltuma…, 2009).

Furthermore energy efficiency of centralised heat supply system substantially affects Latvian power sector in general. If thermal energy tariff exceeds electric energy tariff by at least by 10%, Latvians could start using electricity to acquire thermal energy. It would create issues in electric energy sector, because even at present Latvia has approximately 400 MW base capacity deficits (Akermanis A., 2008).

Therefore, from thermal energy producers' viewpoint, it is of strategic relevance to preserve or to reduce tariff of thermal energy that can be accomplished by enabling thermal energy sources to transfer to more efficient energy resource usage and by activities in cogeneration cycle. However this process demands financial investments, which are affected by the system of settlements – by characterising financial turnover.

The **hypothesis:** settlement system between consumers and energy resource suppliers, defined by laws and regulations, hinders the possibility to increase power efficiency in thermal energy producing enterprises.

The **research aim:** to compare the systems of settlements of thermal energy producing enterprises.

The **research tasks:**

1) to evaluate thermal energy consumer-thermal energy producer system of settlements;
2) to evaluate thermal energy producers and renewable energy resource (wood biomass) suppliers system of settlements;
3) to evaluate thermal energy producers and natural gas supplier system of settlements.

The following **research methods are used in the paper:** analysis and synthesis as well as monographic method to analyse laws and regulations. Graphical method is used to design systems of settlements. The main research sources include laws and regulations of the Republic of Latvia, publications of power sector experts and practitioners, unpublished information of thermal energy producing enterprise "xxx" as well as information from Internet resources.

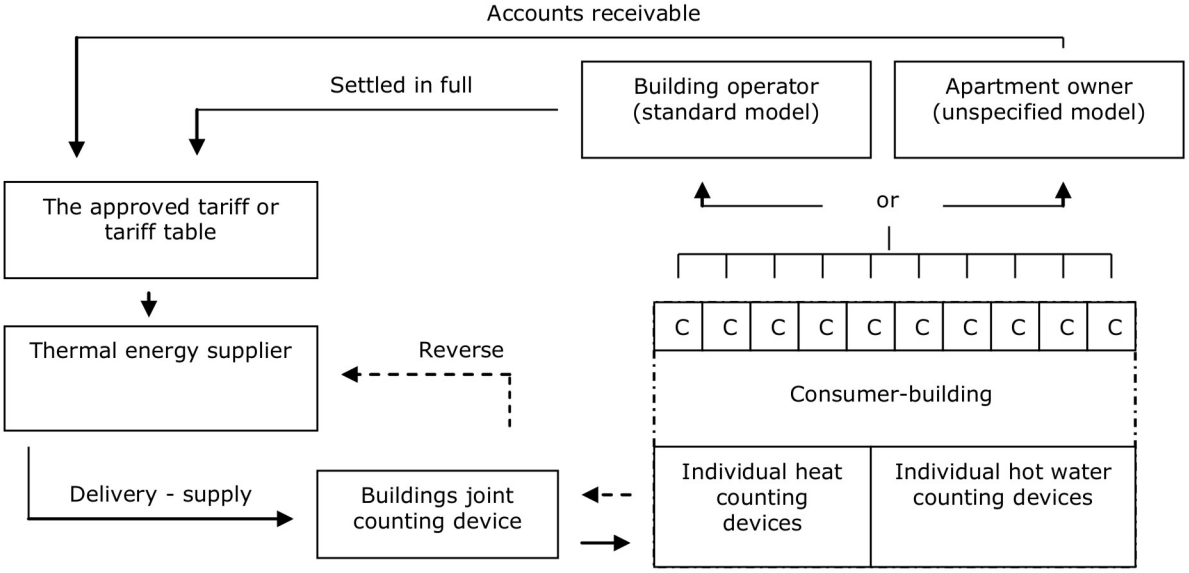
Results and discussion

1. System of settlements: thermal energy producer – consumer

The law "On Local Governments" determines that the provision of thermal energy in the region is one of the local authority functions. The mentioned fact does not exclude the possibility that the local authority may fulfil the functions of thermal energy supplier, and thermal energy producer is a private business entity. According to the fact that in Latvia mostly both functions are fulfilled by one business entity, further in the research, examining systems of settlements, it is assumed that thermal energy producer and supplier is one business entity (Par pašvaldībām, 1994).

Chapter IX of the Energy Law governs settlements for the consumed thermal energy. In addition the Cabinet of Ministers determines the provisions for heat supply, use and suspension of the supply. The Cabinet has issued Regulations No. 876 "Supply and Use of Thermal Energy", which prescribe that mutual settlements for heat supplied are determined by these regulations and a consumer – heat supplier contract.

In order to describe the system of settlements, referring to the laws and regulations, it is relevant to



Source: made by the authors according to the Cabinet Regulations No. 876 (2008), No. 1013 (2008), No. 999 (2006)

Figure 1. **Possible heat consumer-heat supplier settlement patterns**

define a thermal energy user. The Energy Law defines that an energy user is a natural or legal person who purchases and consumes a particular type of energy or fuel from an energy supply merchant or uses it in energy supply or in another type of business activity. In this particular situation the criteria is another type of business activity – management of residential housing, since Ort 1 of section 46 of the Energy Law determines that the purchases the energy for heating of buildings, ventilation, and supply of hot water.

Hence, referring to the law described above and, in addition, to the Cabinet Regulations No. 1013 related to the usage of the apartment property and the Cabinet Regulations No. 999 " Procedures by which Tenants and Lessors of Residential Space Settle Accounts with Service Providers for Services that are Associated with the Use of a Residential Space", it is possible to define who is not a heat user:

- a single apartment in the apartment house;
- a person whose heating system is not directly connected to the supplier's system (because the supply limit is set by the total thermal energy meter);
- a user may not be the one, who pays for consumed heating directly to the supplier; who has no contractual relationship with the supplier; the amount of heat energy consumed in the normal manner is not listed by heat counting device.

In the general settlement pattern, heat supply operator supplies heat (Figure 1), but a consumer (building operator) pays for the used (not received) thermal energy according to the regulator approved tariff.

According to the Cabinet Regulations No. 1013 and No. 999, in practice both standard and non-standard system of settlement may be developed:

- user contracts with the heat supplier and settles accounts directly with the thermal energy producer – the standard pattern;
- user contracts with the heat supplier, excluding direct settling of accounts – consumers (multi-family residential building apartment owners and tenants) pay directly to the heat supply operator – non-standard pattern (model arising from the Cabinet Regulations No. 999, since not all apartment users are the owners) (Enerģētikas likums, 1998., Siltumenerģijas piegādes..., 2008., Kārtība kādā..., 2008., Kārtība kādā…, 2006).

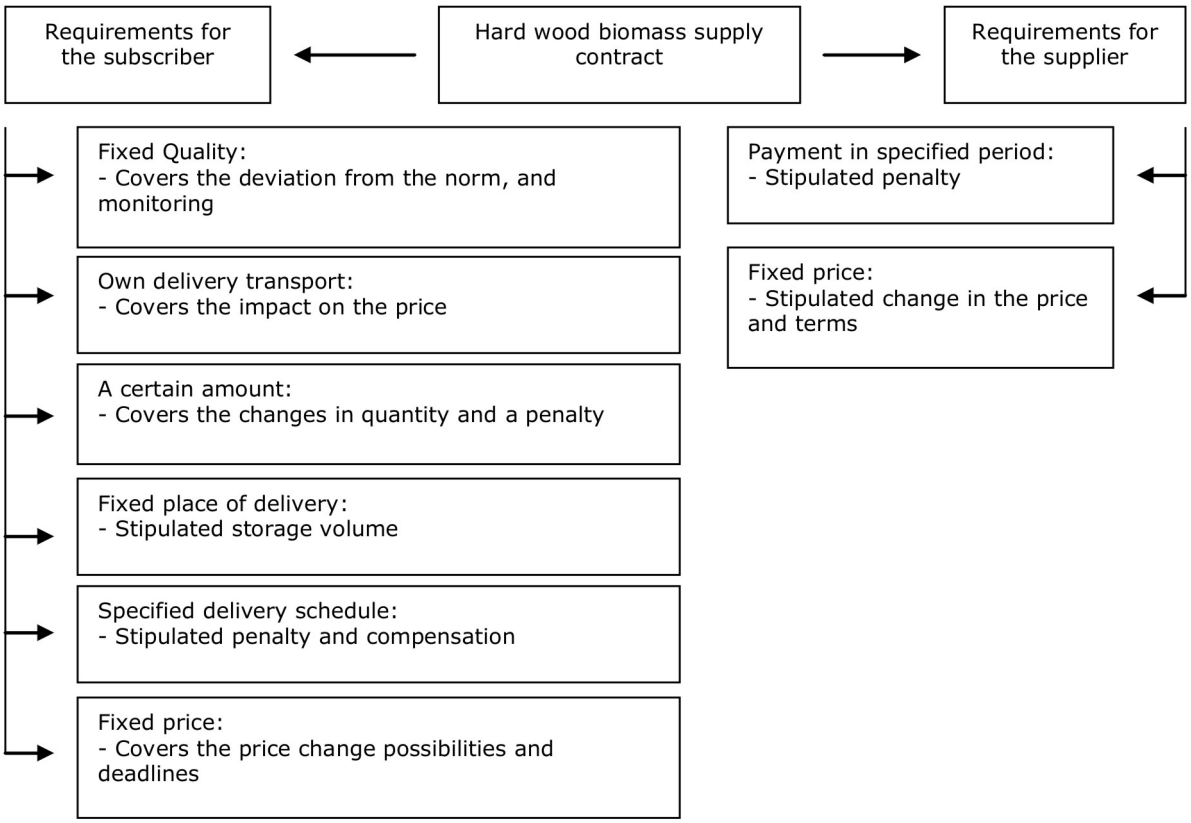
Non-standard pattern in practice leads to a series of issues. A situation implies that the apartment owners and tenants are not aware, which of the operators (heat supply or building managers) to request, or to address the issues arising in residential homes related to the internal heating system. In contract the contractual rights of apartment owners and tenants' requirements to settle directly with the heat supplier for used thermal energy are translated wider by imposing a heat supply operator to provide citizens with an answer on the matters within the competence of the building management as well as the recalculation of thermal energy services. Settlement provides that in the standard pattern consumers have to pay for the thermal energy used in the relevant accounting period until the 20th date of the following accounting period, but in non-standard model until the 30th date of the following accounting period (heat supply operator contract with the building manager) (Latvijas siltuma…, 2009).

In the case of a standard pattern for the current arrangements, the building managers would focus on organisation of internal heating system in order to reduce large heat losses in the internal heating system, to reduce payment amount as well as to prevent massive complaints from the heat suppliers. It is explained by a simple fact – a non-standard pattern is formed on heat supplier debtors (Figure 1), who are included in the heat supply operator's balance sheet. If there is a standard pattern, the heat supply merchants are not affected by such accounts receivable, since they are included in the balance sheet of a house manager. Moreover, if the house keepers delay their payments, they would been charged with penalties, i.e. accounts receivable are no longer burden of heat supply operators, as these debts may not always be regarded as liquid assets.

2. Settlement pattern: thermal energy producer – wood energy resource supplier

Thermal energy producer's settlements for delivered energy resources are determined by an agreement between producer and supplier. The use of wood biomass and natural gas as energy resource is Latvian thermal energy supplier's specificity. Wood is used as the main resource while it is possible to ensure production capacity, though natural gas is used additionally, when the production capacity cannot be guaranteed using wood. Consequently, Latvia's heat supply companies conclude hard wood biomass procurement contracts not for a heating season, but for a certain amount of purchase with the possibility to amend the contract by 20% on average. It is one of the criteria which the Latvian Association of Biomass has quoted as a negative feature of Latvian woodchip business. The Nordic countries are the largest Latvian export markets for wood biomass – delivery contracts are concluded before the heating season for the entire season (Palejs D., 2008).

Assessing the wood biomass supply contract, it is advantageous from the thermal energy producer's point of view (Figure 2), since it stipulates all possible future events. However, the fact that energy producers may only roughly predict wood biomass production capacity is a negative aspect from the energy resource supplier's point of view. Settlement following the delivery schedule for the received wood biomass for the current month is set up until the 30th date of the next month. Thus, thermal energy production enterprise receives a fee for consumed thermal energy, and settles with the energy supplier. If there is a standard settlement pattern concluded



Source: made by the authors according to the unpublished information of a thermal energy producers "xxx", 2009

Figure 2. **Hard wood biomass subscriber's requirements to supplier**

with the thermal energy users, and if the thermal energy enterprise would be economically beneficial to the approved heat rate, then the thermal energy enterprise would be provided with optimal economic activities. In practice, the situation has been made difficult by the fact that the transition to wood biomass setup requires substantial investments.

3. Settlement pattern: thermal energy producer – natural gas supplier

In Latvia Chapter VIII of the Energy Law determines the natural gas supply. In addition the Cabinet determines issues related to the natural gas supply arrangements for users, suspension, and calculation of consumed gas quantity, compensation, and interest rate for late payment.

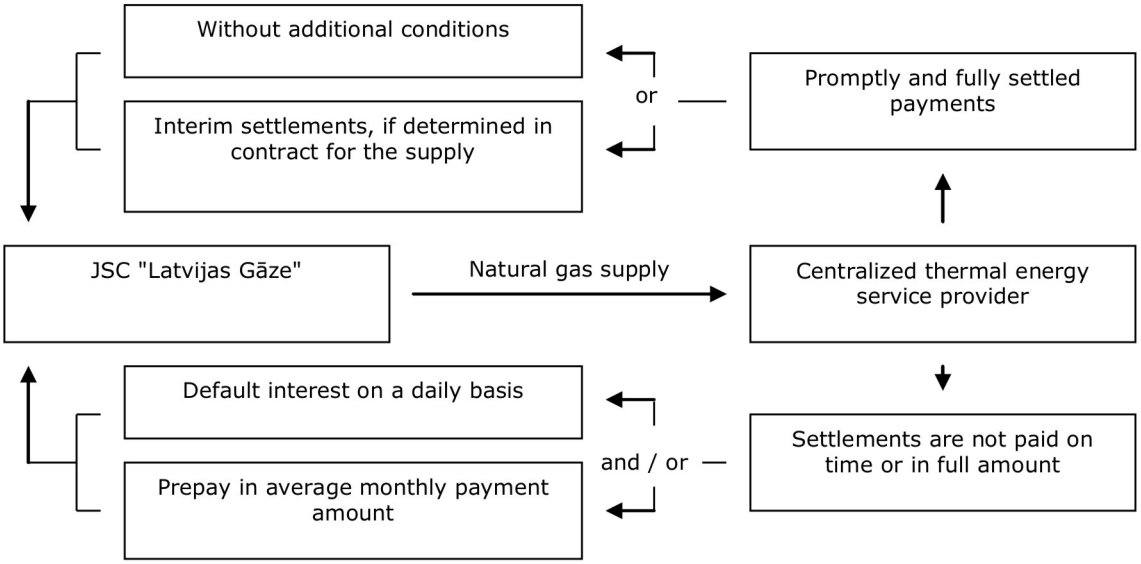
The Cabinet has issued Regulations No. 1048 "Supply and Use of Natural Gas", which prescribe that natural gas is delivered to users in accordance with the Cabinet Regulations mentioned above and the natural gas supply contract terms.

Firstly, there is an important point for thermal energy service providers in the earlier mentioned regulations that in the settlements for natural gas the merchants that providing centralised heating services in the local government receive an adjusted tariff which corresponds to the total natural gas consumption of thermal energy provider's gasified objects. Assessment of natural gas rates by consumer groups published by the JSC "Latvijas Gāze" shows that the higher is the consumption of natural gas, the lower is the tariff; thereby stimulating natural gas consumption (Tarifi, 2009).

Secondly, additional conditions from the mentioned regulations relating to the settlements of natural gas consumption are important for a centralised thermal energy services provider.

The regulations of natural gas supply and usage in the standard settlement pattern already provide the possibility that the operator of natural gas may include provisions (Figure 3) in the supply contract which requires interim settlements to the thermal energy operator, for example, every 10 days. If a thermal energy enterprise delays the settlements for natural gas, then it shall pay fine for each day of delay, i.e. 0.15% a day from the outstanding amount. Besides upon re-late payment, the natural gas operator has the right to predetermine the payment of average monthly amount (Enerģētikas likums 1998, Dabasgāzes piegādes..., 2008).

The JSC "Latvijas Gāze" has the monopoly position in Latvia; therefore natural gas supply contracts with thermal energy producers stipulate that the consumption of natural gas shall be settled until the 10th of the current month for the current month consumption (once in 10 days), while the consumers settle with thermal energy operator for the current



Source: made by the authors according to the Cabinet Regulations No. 1048 (2008)

Figure 3. **Thermal energy supplier's settlements for natural gas use determined by the regulations of natural gas supply and usage**

month consumption only until the 20th or 30th date of the next month.

The described situation makes economic activities of thermal energy suppliers difficult, as any of thermal energy producer's heat tariff components can be thoroughly divided into three groups: heat production, distribution, and marketing expenses. Energy resource (fuel) costs in heat tariff accounts for 60-70% depending on the usable energy resource (Latvijas siltuma…, 2009).

Assuming that the thermal energy production enterprise operates using natural gas and it has a regulator approved tariff table (depending on the cost of natural gas), then if the natural gas tariff is increased, accordingly the heating tariff is increased to cover the costs. However, in the case of rapidly falling outdoor temperatures it is required to use a greater amount of energy resources to provide thermal energy productions technological conditions (heat load, production technology) and / or rapidly increasing price of natural gas – thermal energy production enterprise has to settle accounts for the consumed amount of natural gas per 10 days. Therefore one of the three situations or a combination of certain situations may arise:

- heat production company has free financial assets and it is possible to manage settlements for natural gas on time and in full amount;
- if a thermal energy producer has no free financial assets, it is possible to vary the remaining 30% of heat tariff influencing factors (staff salaries, repair costs, and electricity costs) to cover the cost of natural gas;
- thermal energy production enterprise already has the commitments, wherewith there are no free or adjustable financial assets to cover the costs of consumed natural gas on time, it is necessary to make new financial commitments – from the use of borrowed capital, incurred additional costs, which may essentially result in a loss.

Referring to Section 1 of the Commercial Law regularity, independence, openness, consideration, and activities of a special commercial entity - a merchant are business concept characteristics. Profit-making is a key business objective and rationale, and the target for acquiring the status of merchant is profit seeking. The Commercial Law does not recognise gratuitous transactions because they are contrary to the nature of business. According to the explained business concept and the situations described, the substance of any of them ("a", "b" and "c") is contrary to the concept of a business – either a loss resulting from the lack of profit, when the amount of free financial assets is too large, or loss resulting from liability expenses (interest rate) (Komerclikums, 2002).

Conclusions

1. Reorganisation of consumer settlement patterns to a single settlement model: heat supply operator-consumer (not the user) is the basis for:
   - thermal energy users to understand each merchant (heat supply and house management) within the remit of the issues and heat problems, require addressing supervision issues;
   - house management to pay more attention to organisation of building internal heating system;
   - thermal energy consumer - so that accounts receivable do not hinder thermal energy producers economic activities.

2. Hard wood biomass procurement contract for a certain amount is economically viable for Latvian thermal energy producers.
3. The current settlement pattern of natural gas consumption for a thermal energy production enterprise is contrary to the nature of business, thus affirming the verification of the hypothesis.

Proposals

1. Local governments should use only one settlement pattern for the consumed thermal energy: building management-thermal energy supplier shall define each operator's rights and obligations, and contribution to the improvement of inner heating system of a building.
2. Thermal energy producers have to conclude woodchip purchase contracts referring to a predefined amount instead of a time period. It is the main factor to ensure real market price.
3. A point, which lets natural gas supplier be able to implement advance payments should be excluded from the Cabinet Regulations No. 1048 "Supply and Use of Natural Gas" to avert the inconsistency between the essence of business and settlement pattern for thermal energy producer-natural gas supplier.

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"ECONOMIC SCIENCE FOR RURAL DEVELOPMENT"

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RESOURCES AND EDUCATION

2. Education and Research for the Countryside

New Challenges for Governance of Higher Education Institutions

Dita Štefenhagena, Mg. sc.soc., PhD student
Public Administration
Management Science
Faculty of Economics and Management
University of Latvia

Abstract. The aim of the paper is to analyse higher education institutions (HEIs) status within the state public administration system and the recent challenges in HEIs governance in Europe, Latvia, and Finland.
The author uses terms "higher education institution" and "university". Higher education institutions mean public HEIs – universities, academies, and other HEIs. University is not so broad term as HEI, and it is used when describing the university role or functions.
Public HEIs are part of the state public administration system, at the same time public HEIs are autonomous education and science institutions with self-government rights. On the part of state government, HEIs are brought under strict regulations; however due to their status of autonomy and self-governance, they obtain certain flexibility – there is a space for new governance processes. In the increasingly competitive higher education market, institutions shall ensure that they are responding to the demands and needs of society as best as they can. The current economic crisis is again bringing up the issue on higher education reforms. The higher education reforms are actively implemented in Finland, while the possible reforms are only discussed in Latvia. The reforms will present some new challenges also in university governance.
Research object: public higher education institutions. Research subject: HEIs' status and new challenges for governance. Research basis: scientific articles, research papers, and professional literature. Research methods: monographic method and comparative analysis.
Conclusions: the author comes up with several conclusions, where part of them originate from the European University Association's (EUA) recommendations to the European HEIs governance challenges**.**
Key words: public higher education institutions (HEIs), public universities, new challenges, university governance, higher education reforms, economic downturn (crisis).

Introduction

The public higher education institutions (HEIs) are state intermediate institutions with a secondary public status. On the one hand, public HEIs are part of the state administration system, but on the other hand, they are autonomous education and science institutions with self-government rights. Governance means ruling with authority, it is a function of governing, regulating, controlling and influencing management processes on the institutional level.

The autonomy of HEIs is characterised by the division of authority and responsibility between the state institutions and the HEIs. The HEIs' autonomy is expressed by the rights to freely choose the ways and forms how to implement their activities; HEIs undertake responsibility for the education and science quality, efficient use of financial and other resources, following democratic principles, and laws and regulation which regulate the performance of HEIs. The latest changes in public sector have not been supportive to the higher education. The government of Latvia has made severe budget reductions, and the budget is dramatically reduced for the public HEIs due to the economic downturn. In 2007 the state financing for HEIs was LVL 187.2 million, while in 2010 it amounted to only LVL 49.5 million. The financing for higher education made 0.7% of the state budget in 2009, which is 2-3 times less than the average European indicator. The higher education budget in 2009 was approximately LVL 15 million which is an average financing for a single HEI in Europe *(http://izm.izm.gov.lv/).*

At the same time, it cannot be denied that public HEIs performance through the years has not been highly effective. The number of public HEIs has grown from 10 in 1991 to 19 in 2009. There are approx. 545 students on 10 000 inhabitants which is one of the highest numbers in the world (*http://izm.izm.gov.lv/).* The issue remains open – what are the changes and challenges to be expected in higher education sector in the near future? Like in all public sectors, the sector of higher education needs improvements. Part of the changes will come in a natural way – competitiveness among HEIs is increasing – it is determined not only by the labour market but also by the demographic situation. The number of students will decrease during the next 3-4 years. At the same time the higher education will be demanded also in the future. There will be an increased demand for education quality and alternative education forms, like lifelong learning and others. Along with natural changes, some of the changes will have to be introduced by structural

reforms. The higher education quality processes are not separated from the HEIs governance processes. A qualitative higher education is possible only in a dynamic and effective decision making environment. Improvements in HEIs governance processes will promote a better quality assurance for studies. Public HEIs are part of the state economy, as users of the state budget they are responsible for their governance structure, economic use of resources, performance effectiveness, and efficiency.

The aim of the paper is to analyse higher education institutions' (HEIs) status within the state public administration system, and the recent challenges in HEIs governance in Europe, Latvia, and Finland. Both countries Latvia and Finland are members of the EU education system, they both have joined the common European Higher Education Area.

The author has come up with **the following tasks** to reach the set aim:

1) to characterise HEIs governance structures and status within the state public administration system in Europe;
2) to identify and analyse the recent challenges faced by the HEIs governance due to the economic crisis and possible structural reforms in Latvia and Finland;
3) to draw conclusions.

Research methods: monographic method and comparative analysis.

Results and discussion

Structures of higher education governance in Europe

HEIs in almost every European country have been under reforms following the widespread goals and objectives **to develop new models for institutional governance**. The structure of state HEIs institutional governance is similar in all Europe. Almost all institutions have a collegiate academic body (Senate, Academic Council or Academic Board). The decision making body is responsible for long-term and strategic planning and for determining the institutional orientation (*Higher Education Governance in Europe, 2008*).

HEIs through Europe have become autonomous entities according to national legislation. There is a longer tradition of institutional autonomy in the Netherlands, the UK, and Iceland than in other countries. As autonomous entities, the institutions are assuming many of the governance responsibilities previously held by the government; however, HEIs are still regulated by the government and the governmental bodies. **The new European HEIs governance structure consists of three governance mechanisms: external guidance and regulation, managerial self-governance and academic self-governance**. Changing expectations of HEIs' contributions to knowledge – based economy and society over the past decade have transformed the relationship between the state and HEIs. University governance and the degree of control exerted by the state has become the subject of much debate. The European Commission (EC) and a significant number of European governments have recognised the need for university autonomy. In its Communication *"Delivering on the Modernisation Agenda for Universities" (May, 2006*), the EC marks as a priority the creation of new frameworks for universities, characterised by improved autonomy and accountability. The Council of the European Union confirms this approach and makes an explicit link between autonomy and the ability of universities to respond to the society expectations *(University Autonomy in Europe, 2009).*

Although many studies have identified a trend away from direct state control towards indirect steering mechanisms, and there is a broad agreement on the importance of autonomy for the achievement of universities' missions, public authorities still retain a central role in the regulation of the higher education system and large number of countries still exert direct control *(University Autonomy in Europe, 2009).* All European HEIs community is aware that there is a need to increase autonomy in HEIs governance to successfully implement the university mission which nowadays becomes even more complex, and to respond to the growing society expectations. HEIs, especially universities, have obtained a new relevance and an enlarged expected impact. From various academic sources it is seen that the European HEIs are aware of the necessity (especially in organisational and financial management issues) to enlarge autonomy, yet at the same time they also appreciate government support.

The further description in this article states various forms of HEIs management which represent HEIs governance. The academic sources come up with four governance forms which are represented in every HEI in Europe. HEIs' governance in Europe is usually explored in the following governance matters:

- **organisational (which means structures and institutional governance);**
- financial (different forms of acquiring and allocating funding);
- staffing (the capacity to recruit staff, etc.);
- academic (the capacity to define academic profile, to introduce programs, etc.).
- (University Autonomy in Europe, 2009)

The present study focuses mainly on organisational (institutional) governance.

Taking into account HEIs complex governance, and being aware of the mission and changing environment which is faced by European universities, **the EUA has identified the major governance challenges** which are more or less faced by all HEIs in Europe:

1) composition of **supervisory board** – equal proportions of internal and external stakeholders, or the majority of internal stakeholders. External stakeholders bring outside perspectives, expertise and link with the society; however, the existence of supervisory bodies composed solely of external stakeholders can be quite controversial in terms of institutional autonomy.

As other institutions, HEIs are resistant to directives that come "top-down";

2) the aspect of self-governance provides institutions with **sense of ownership** over the governance processes: instead of being held accountable to the external body, **the institution holds chief responsibility for the direction, planning, and monitoring of its activities;**
3) higher education officials, leaders, experts, and researchers have expressed concern about the **lack of professional management experience**. There are arguments in support of self-governance by academic experts as the most qualified stakeholders who safeguard traditional values of higher education against negative effects of globalisation and massification. However, academic expertise does not necessarily imply competence for handling the diverse demands facing higher education leaders today. There are various different responses through Europe to the need for increased professional management competences in higher education (*University Autonomy in Europe, 2009*).

The first challenge refers to the composition of shareholders in the supervisory board, or, in other countries, e.g. Latvia, the Advisory Board. If this board is of high influence to the HEI governance, it is risky to have the majority of board members from external structures. It may be controversial in terms of HEIs institutional autonomy. Self-governance and autonomy status provide positive aspects in HEIs governance, but it also increases the HEIs self-responsibility, which is a challenge. The last item, identified as a challenge in HEIs governance concerns the professional management education and experience for HEIs governors. Historically, HEIs governors are coming from the academic staff and they represent the academic interests in its better sense. Although, nowadays complex and diverse demands which are set up to HEIs governors in institutional management environment, may be too complicated to be responded without professional management experience and education. This issue is viewed further on in this article, under the sub-section of the Finnish HEIs governance, stating that the issue of making institutional leadership more professional is actively disused in Finnish HEIs.

HEIs governance challenges in Latvia

During the Soviet time in Latvia, HEIs were subordinated and were directly subjected to the state system. They used the state budget resources for 100% for their study programmes and governance needs. The time has changed, and since Latvia's independence, HEIs have obtained a status of state intermediate institutions with self-governance rights. The university administration is responsible for the education quality, rational and goal oriented use of material and financial resources, following democratic principles, laws and regulations which determine university performance. Within the mentioned terms, the university has the rights to determine its own ways of management, following its goals and objectives, and the legislation. It gives the university a possibility to introduce innovative management processes which lead to a better performance results.

In 2009, the state financing to public HEIs was drastically reduced due to the overall economic crisis in Latvia. The public opinion is that during the economic downturn higher education and science are those sectors which should be promoted instead of destroying. This opinion was supported also by the EUA delegation visit to Latvia in November, 2009: ***"Universities are motors for economic recovery offering opportunities to diverse groups of learners, and providing the optimal creative environment for the talented young researchers Europe needs."*** The EUA offered the expertise in coordinating an external review, to be carried out by international experts, of the proposals on the schedule for reforming the structure of higher education in Latvia. Among potential issues that could be addressed in such a review, in addition to the overall structure of the system, a number of questions were raised addressing EUA's comparative study on university autonomy, such as the ownership of real estate in European universities, and different funding strategies (*EUA delegation visit to Latvia…, 2009*). As emphasised in the Prague Declaration, the EUA is calling on all member states to step up efforts to reach the Barcelona target of 3% investment in research and development, and to invest at least 2% of GDP in higher education (http://www.eua.be/eua-news/).

The current economic crisis is bringing up the issue on the higher education reforms. The work group established by the Minister for Economy and the Minister for Education and Science has come up with an informative report on the necessary structural reforms in higher education and science in November 2009. The reforms in higher education both among the public opinion and HEIs governors are perceived as something negative, but they will happen, and these reforms will be implemented through a couple of years. During the 1990s and continuing in 2000 and later, many of the tendencies in HEIs governance have not been persistent and sustainable. Partly, it has been connected with the changing state policy in regard to HEIs issues. HEIs have developed large administration structures and in many cases resources have not been used economically. Before coming up with large strategic external goals, it would be better to look at each institution internally, and to reorganise internal structures in order to achieve better performance results. All positions and structures developed during the years of economic growth are very rigid and not interested to be brought under reforms. At the same time, the state government, when speaking about reforms, is not allowed (and not interested) to look at each HEIs internal institutional structure. Instead of that the government proposes to start reforms from the external strategic angle. The four main objectives of the reforms in higher education in Latvia, which have been proposed by the government work group for higher education and science reforms are as follows:

1) to ensure international quality of studies and research;
2) **to ensure more effective use of resources (not only financial but also material, technological and human, author's comment) and their return;**
3) to promote internationalization and global competitiveness;
4) to ensure integration with national economy, development of innovation and science transfer (http://izm.izm.gov.lv/).

As it is seen from the objectives of the proposed reforms, only the second objective refers to the institution's internal reform. But, as it was stated above, all successful reforms have to start within each institution internally, and then pass to external strategic improvements.

Discussions of HEIs reforms, including not only HEIs merges or possible HEIs liquidation, but also other changes (result oriented structures, economic use of resources, improved quality, etc.) which are expected from HEIs in Latvia are still going on. It seems that the agreement will not be reached in the near future due to different opinions and interests represented by all parties involved (government, HEIs, students).

HEIs governance challenges in Finland

The institutional governance bodies are similar in Latvia and Finland. In both countries the Senate is the HEI's academic and decision making body and Rector is the executive head of the HEI. In Finland as well as in Latvia, the public opinion is that the number of HEIs is too large. But instead of pressed mergers, the Finish academic community is initiating merges by itself. When planning strategically, it can be seen clearly that the demographic processes do not require so many HEIs. For example, Turku University merged with Turku School of Business Administration on January 1, 2010, yet it is not the only example of a volunteer HEIs merge.

The university administration and decision making systems have been streamlined by reducing the number of levels and delegating authority back in the 1990s. The trend of the 1990s was to increase the power of rectors, deans and heads of departments at the expense of the collegial bodies. In addition, the dynamics of the higher education system changed with the introduction **of new steering instruments called "management by result"**. **The goal of the management by result is to reward performance and effectiveness** (*Academic Staff in Europe, 2001).* Structural reforms are one of the most extensively discussed issues within the higher education system in Finland. It is closely linked to the national "productivity programme" which ran from 2003 to 2007 and covered the entire public sector. The aim of the programme was to improve productivity and efficiency of public sector. This directly affected personnel policies and organisational structures of universities. For example, some administrative services were transferred to service centres established by collaborating institutions and alternative production models were debated from the regional perspective (*Higher Education Governance, 2008*).

The Finnish higher education system is a binary one. In 2009 it comprised 20 universities and 26 polytechnics under the auspices of the Ministry of Education. The National Defence University, under the Ministry of Defence, is Finland's 21st university. The higher education system is seen as an essential element of Finland's national and regional innovation systems, and there is a link between higher education and economic policies. These policies have been strengthened by several national policy initiatives and reforms both the university and polytechnic sectors (*Aarrevaara T, 2009).*

Finnish universities have been perceived as institutions struggling to keep up in an increasingly global and competitive world, and perhaps unnecessarily constrained. University reform, which started in Finland in 2009, is seen as providing the solution to this problem. Finland's reforming of its university sector will be effected through a new Universities Act. At the same time, Finland is moving towards a series of university mergers that would reduce its 20 universities to 15 or 16. Both the new act and the mergers can be seen as attempt to improve university efficiency and effectiveness.

The Finnish HEIs challenges are:
1) HE system is still rather close;
2) changes in international operating environment;
3) increasing European dimension in quality evaluation and quality assurance;
4) unbalanced markets with other countries *(Finnish Higher Education Evaluation Council, 2009).*

Institutional, managerial and organisational changes will occur continually, whether stakeholders like it or not. Finnish universities have always been tightly controlled by legislation. The proposed reform will change this by freeing up the system and setting the scene for the development of an entrepreneurial culture.

In Finland, there is pressure at the institutional level for more professional leadership and the role of the university Senate focuses increasingly on strategic issues. As universities have increased their services to society and diversified their funding base, they have had to increase and professionalize their staff who support external activities and administer external funding. In general, the balance between individual leadership and collegial councils is changing, and the power of individual leaders is increasing. The issue of making institutional leadership more professional and of the election or appointment models for governance bodies and academic leaders (rectors, deans) is actively disused in Finnish HEIs *(The Rise of Knowledge Regions, 2006).*

In regard to Finish HEIs' administration and finance, universities are very independent in their internal affairs because they enjoy autonomy and freedom of research. Universities determine their own decision-making systems independently according to the Universities Act. **In Finland all universities are state-owned and subordinate**

to the Ministry of Education, which is responsible for preparing university matters which are in the government remit and for appropriate administration and steering of universities.

Apart from legislation and the policy outlined in the Government Programme and in the development programme, universities are steered by means of performance agreements concluded by each university with the Ministry of Education. The foremost **instrument in the university steering is resource allocation, normative regulation and information-based guidance**. The three-year performance agreements specify the objectives of university operations, such as degree targets, the resources needed to achieve them, monitoring and evaluation of target achievement, and the development targets. These objectives and targets are reviewed and confirmed in annual performance negotiations. During the negotiations, the universities receive feedback, first orally and later in writing, on their previous year's performance and on development needs.

The appropriations granted by the Ministry of Education for university activities consist of core funding, performance-based funding, and project funding. Core-funding is intended for instruction and research. **Direct government funding covers about 64% of university budgets.** In addition to the Ministry of Education, important sources of financing are the Academy of Finland, the Technology Development Centre, business enterprises, the EU, and other public bodies. **Most external funding is targeted to research.** The Academy is responsible for the evaluation of research. Universities also have income from commercial services, such as continuing professional education *(http://www.eua.be/eudis/)*.

Higher education reforms implemented in Finland, foresees vision for 2020. The vision shows the following results:

- **no more than 18 polytechnics**, providing flexible and profiled higher education units and structures;
- strong and dynamic interaction with the region and internationally;
- well-established, high quality research and development in priority areas;
- **no more than 15 universities** with strong units and profiles, clear priorities in research, internationalization and world-class research;
- **4 to 5 strategic HE alliances.**

From these statements it can be seen that Finnish HEIs are planning their existence in a strategic and sustainable way. Finnish HEIs are ready to change considering the external factors (demographic situation, expanded role of universities, etc.).

The aim of the paper has been reached. The author has analysed HEIs status within the state public administration system. The recent challenges in HEIs governance in Europe have been described, presenting some examples of HEIs governance challenges in Finland and Latvia. Taking into account the information which has been described and analysed, the author comes up with several conclusions at the end of the article.

Conclusions

1. In order to successfully implement reforms and overcome challenges, HEIs need to have the right framework conditions – an increased autonomy, in particular in financial aspects, human resource management, and design of governance structures and leadership development. The crisis calls for European HEIs to establish coordinated and strategic institutional responses.
2. The EUA has defined challenges for the European HEIs' activities:
   In regard to funding, it is clearly suggested that diversification cannot and should not replace public funding and funding diversification needs time and investment. Necessity to simplify funding rules in order to reduce costs and to establish funding incentives to engage in partnerships and foster donations from private sector is also emphasised in EUA recommendations. In this context, income diversification becomes a necessity but it is hindered by the lack of available alternative sources.
   In regard to human resources, it is necessary to invest in institutional human capital to further enable institutions' capacity. Thus there is a need to increase use of untapped potential (!!!) within the universities. Creation of a professional stakeholder management, establishment of a strong leadership and management – these are challenges to be highlighted.
3. As entire public sector, HEIs as state sector institutions need to improve their productivity, efficiency and effectiveness (note that there is a difference between terms "efficiency" and "effectiveness", author's comment). The management by result principle has to be introduced. Finnish HEIs are working with it since the 1990s but in Latvia HEIs "management by result" principle is still not very popular.
4. Finnish HEIs challenges stated by the Finnish Higher Education Evaluation Council are the following: rather close HE system, changes in international operating environment, increasing European dimension in quality evaluation and quality assurance, and unbalanced markets with other countries. Finnish HEIs are very independent in their internal affairs, since they enjoy autonomy and freedom. Universities determine their own decision-making systems independently according to the Universities Act. In Finland all universities are state-owned and subordinate to the Ministry of Education. The foremost instrument in the university steering is resource allocation, normative regulation, and information-based guidance.
5. Latvia's HEIs governance major challenge - drastically reduced state financing in 2009 and in 2010. As it is seen from the Finnish example, new sources of financing have to be developed (business enterprises, project based funding (not only the EU!), commercial services based funding, etc.) in Latvia's HEIs. Appropriate and successful resources management and structural changes are the next challenges faced by HEIs

in Latvia. Investments in institutional human capital are low and it would be an obstacle in increasing institutions' long term capacity. Also, Latvia's HEIs do not represent an interest in increased use of untapped human potential.

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Strategies for Funding Higher Education in Latvia: Today and Tomorrow

Jānis Eglītis
Dr. oec., researcher, Faculty of Social Sciences, Daugavpils University
Ludmila Paņina
Mg. oec., PhD student, Faculty of Social Sciences, Daugavpils University

Abstract. The significance of education policy in the EU has risen in recent strategies. During the past couple of years, the higher education system in Latvia has been undergoing a major transformation influenced by national and international developments such as the rapid expansion of student enrolment, a relative decrease in public funding along with a shortage of private funding, the increasing importance of research and innovation in the global and knowledge-based economy, and the wider competition between higher education institutions. The higher education system has experienced democratisation, restoration of academic autonomy, and changes in its funding system as some educational expenses were shifted from the government to parents and students. Therefore the policies, regulations, incentives, and accountability measures are discussed within the contexts of governance structures and funding.
The aim of this study is to provide an in-depth understanding on national strategic frameworks of higher education funding and governance in Latvia. The article deals with the theoretical and practical research of financing the HE in Latvia. The research is primarily based on quantitative comparative research methods. Quantitative indicators are used to characterise specific features of the funding systems of higher education in Latvia, and to compare funding schemes of higher education with the ones used in other EU member states. Analysis of legislative and policy documents is performed as a part of the research. Methodology and definitions UNESCO/OECD/EUROSTAT (UOE), Eurydice and the Ministry of Education and Science of the Republic of Latvia data collection on education statistics were used for the calculations. Previous researches, comments, and analysis of international experience of OECD, UNESCO, World Bank, Eurydice experts were applied as the research basis.
The research results will help evaluate the current situation in the sphere of higher education, the procedure of financing, general material provision as well as analyse the necessity and directions of changes of the models and schemes of funding. The obtained research results could be used by those people who form the policy of education or plan the funding, as the research contains statistical data related to the general funding of the sphere of education and its structure.
Key words: higher education, funding sources, strategy, structure, scenarios.

Introduction

During the past couple of years, higher education systems in the Baltic states have been undergoing a major transformation influenced by national and international developments such as the rapid expansion of student enrolment, the relative decrease in public funding alongside with the shortage of private funding, the increasing importance of research and innovation in the global and knowledge-based economy, and wider competition between higher education institutions. More recently, the impact of the Bologna process on curricular reform, quality assurance, and mobility has become one of the key driving forces of change. In line with the major political and economic transformations taking place in the region since the early 1990s, higher education reforms have also taken place in Latvia. At the moment there occur structural transformations in the higher education, and they need to be regulated with the help of reforms. Such structural transformations are evident, their causes result not only from the global economic recession, but these are also changes, caused by the knowledge-based society (the introduction of high information and communication technologies, the higher education becomes widely accessible and marketable), and also general globalisation tendencies.

Thus the policies, regulations, incentives, and accountability measures are discussed within the contexts of governance structures and funding. Accordingly the existing higher education strategy should be reconsidered approximating it to the possible industry development scenarios.

The research aim is to provide an in-depth understanding on national strategic frameworks of higher education funding and governance in Latvia in order to create the valid development strategy of higher education in Latvia.

The research focuses and explores the following:

- overview of HE funding system in Latvia;
- analysis of available objective data on HE governance and funding system in Latvia;
- analysis and comparison of available objective data on the structure of funding HE in Latvia and other Baltic and the EU countries;

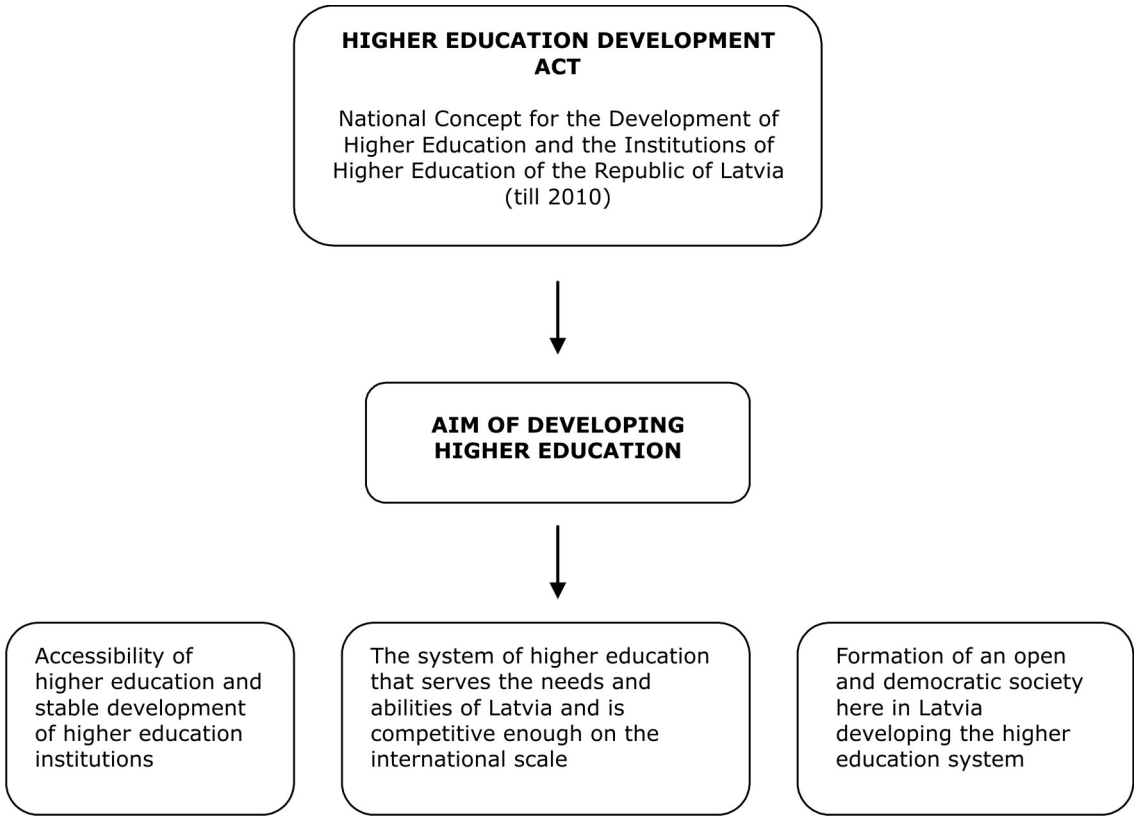
- analysis of various viewpoints concerning strengths and weaknesses of HE funding system in Latvia;
- overview of experience gained by the EU member states in structure and frameworks of HE funding.

Higher education policy

The significance of education policy in the EU has risen in recent strategies. Decisions of the Lisbon and Feira European Councils in particular made education a significant factor in building a competitive and dynamic Europe. In the Presidency Conclusions of the Lisbon summit on March 23-24, 2000, the EU Council underlined the direct link of the continuing economic and social progress in the EU and investment into people and their education: "People are Europe's main asset and should be the focal point of the Union's policies. Investing in people and developing an active and dynamic welfare state will be crucial both to Europe's place in the knowledge economy and for ensuring that the emergence of this new economy does not compound the existing social problems of unemployment, social exclusion and poverty" (*Presidency Conclusions Lisbon*.. 2000, p. 24). Hence the need for longer-term planning and strategy formulation for higher education is widely recognised across the Europe and Latvia as well.

A precondition for building a knowledge-based society is a fair and effective education system, a vital and advancing component of which is the higher education. The development of higher education system in Latvia is based on the continuity of national higher education system, and, in setting the goals, the common policies of the EU have been considered, including primarily the Lisbon strategy and the creation of the common European higher education area formed by the Bologna process, and the European research area. The government of Latvia has developed The National Economy Development Plan, which prescribes also to focus strenuously on the development of engineer-technical and nature sciences study programmes. The European Union Structural Funds are also used for the education system improvement in Latvia; however they mainly refer to professional education development, the improvement of study quality in the sector of nature sciences and the technology sector. The National Development Plan of Latvia covers a task to create a competitive, knowledge-based society, which is able to establish new knowledge, use it for the national economy development and increasing the general standard of living (*Latvijas Nacionālais attīstības plāns,* 2008).

The governance structure of education system corresponds to the state administration structure.



Source: made by the authors according to *Izglītības attīstības pamatnostādnes 2007.–2013.gadam* 2006; *Augstskolu likums* 1995; *Izglītības un zinātnes investīciju programma 2005-2009.gadam* 2007; *Augstākās izglītības un augstskolu attīstības nacionālā koncepcija periodam līdz 2010.gadam*. 2001.

Figure 1. **Analysis of higher education strategy in Latvia**

Governance of the education system is accomplished at the national, municipal and institutional level. The state and local governments set up administrative units and education support institutions. At the national level, the Cabinet of Ministers develops educational policy and strategies, and adopts legal and regulatory enactments concerning education. Further education system tasks relate to long-term goals of the education development, which determine the necessity to ensure the education quality and efficiency of expenditures. State-founded higher education institutions are self-governing. The Ministry of Education and Science is responsible for the long-term planning, assessment, organisation and general administration of higher education institutions. Generally, higher education institutions are headed by a rector and vice-rectors in studies and research (Figure 1). The state determines the number of students in higher education institutions who study at the expense of the national government budget.

Stabilising a new economy in the system of modern globalised national economy is an essential factor for increasing competitiveness of the country. The quality (quality of material basis, quality of higher education institutions staff salary etc.) and availability (corresponding amount of budget places and study fee size and suitability) of higher education are the main conditions of the new economy. The quality and availability are undeniably connected with the existing higher education funding adequacy and its application efficiency. The financial provision is one of the milestones of higher education efficiency in the existing situation.

Funding basis

The main indicators of higher education system in Latvia (at the beginning of 2009) are as follows:

- total number of students equals to 125350 students, of which 103 898 students (83%) are full time students (in state HEIs – 67 547 students (65%), in private HEIs – 36 351 students (35%)); 545 students per 10 000 population;
- public funding students equals to 33 355 students (27%), private funding students equal to 91 995 (73%);
- 34 HEIs (19 state and 15 private) as well as 26 colleges (18 state and 8 private);
- HEIs expenditure (2007) LVL 210.4 million (1.5% of GDP), of which LVL 127.5 million – state funding, and LVL 58.8 million – private (tuition fees).

Latvia like its neighbouring countries Lithuania and Estonia is in the process of introducing specific policy documents that outline national strategic priorities for ensuring the financial sustainability of higher education sector. Although concrete policy solutions vary from country to country, some common medium term objectives are apparent. The current national strategic priorities in higher education in Latvia are as follows:

1) increase in public funding;
2) more autonomy in the management of financial resources:
   - direct links between results and funding;
   - diversification of funding;
   - creation of partnerships.

Governments are encouraging the development of closer relations between HEIs and society as a whole. Policy measures in this area aim to promote scientific achievements and the resulting opportunities among the wider audience. Meanwhile, it is also a priority to link teaching and research with national economic and social imperatives (including specific regional needs). Many governments are specifically promoting and co-financing the creation of multilateral partnerships or consortia among HEIs, research institutes, regional authorities and/or private companies (*Higher Education Governance in Europe,* 2008).

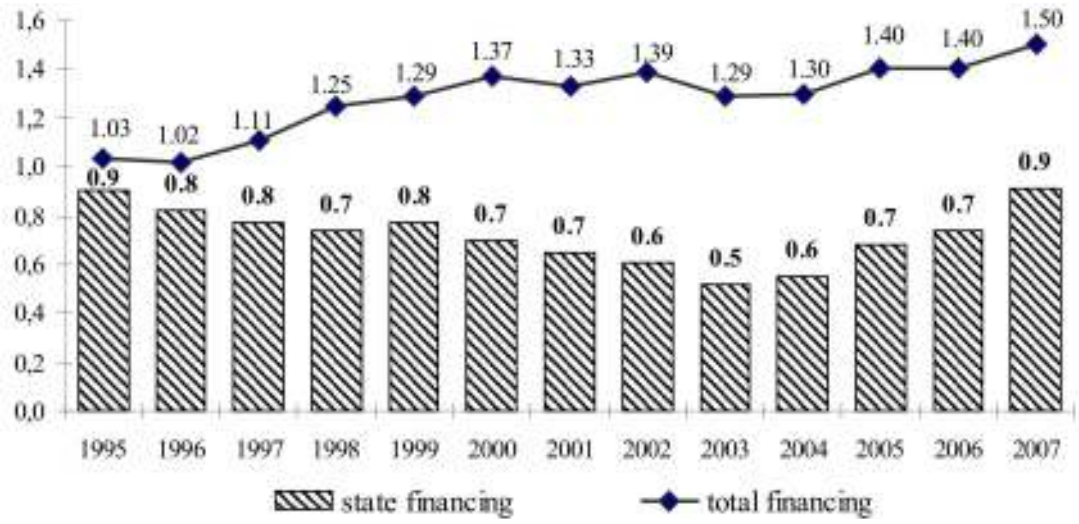
Having analysed the structure of higher education financing in Latvia, it can be concluded that higher education financing from the state budget in Latvia constitutes more than a half of all finance resources spent on higher education in 2007, where the study fees constitute about 1/3 (LVL 58.8 million or 27.9%) of all financing (Figure 2). Despite this fact, in the study year 2008/2009 approximately ¼ of all students (28%) were studying at the expense of the state budget; other students paid for their studies themselves both in the state and private higher education institutions (*Pārskats par Latvijas augstāko izglītību 2008. gadā,* 2009). Thus up to 2003-2004, all measures aimed at the growth of higher education financing were mainly oriented on the growth of available credit resources, the involvement of employers into the financing of higher education, attracting private and individual finances for the creation of scholarship funds (*Izglītības attīstības pamatnostādnes 2007.-2013.gadam.* 2006).

Central authorities are increasingly interested in optimising the balance between the financial resources they invest in higher education and overall outcomes of the sector. They are establishing funding mechanisms aimed at linking results or output to the allocation of the future public funding. It is usually done through the process of budget negotiations and the conclusion of contracts between HEIs and the relevant Ministry or Funding Council, or by using formula budgeting systems that include performance indicators.

The public funding mechanisms for higher education in Europe represent options, through which central governments pursue their strategic objectives within the sector and show an overview of these trends (*Higher Education Governance in Europe* 2008). The main mechanisms applied for direct public funding in Latvia:

1) funding formula;
2) contracts based on a predetermined number of graduates by the field of study;
3) funding for specific research projects, awarded in the framework of competitive bidding procedures.

However, speaking about the analysis of performance factors we should mention that the



Source: *Pārskats par Latvijas augstāko izglītību 2008.gadā* (skaitļi, fakti, tendences). Rīga: Izglītības un zinātnes ministrija, Augstākās izglītības un zinātnes departaments, 2009

Figure 2. **The share of total and state financing of higher education in the GDP of Latvia in 1995-2007 (%)**

only criterion, which is used in the higher education system of Latvia, refers to the results of students. Other criteria, including those, which allow measuring both the quality and effectiveness more precisely, are not applied in higher education of Latvia. Thus, for example, in some European countries in the process of allocation of funds other performance factors are evaluated as "lowering of staff costs", "results of the evaluation of institutions", "quality of infrastructures, management and services provided to the university community" etc. (*Higher Education Governance in Europe* 2008). In Latvia contracts between HEIs and the public authorities concern public funding that 'purchases' education services provided by the institution. These services should ensure that a certain number of students graduate by the end of a given period in particular subjects or groups of subjects at specific levels of study, and offer the corresponding study places exempt from tuition fees.

Higher education is funded by means of two distinct types of operation, namely, direct public funding to institutions and indirect funding through financial support to students, and transfers to companies and non-profit organisations. In Latvia there is also available both direct and indirect funding at the level of higher education. However, the possibilities of indirect funding investment and return are limited, both due to the weak legislative environment and little interest of parties.

The following sources of private funds are available to public HEIs (authorised without restrictions):

1) donations/legacies;
2) loans;
3) rent/revenues from property;
4) use of research results/ contracted research;
5) fees from service provision;
6) interest on investments (*Augstskolu likums* p. 78).

Joint research projects or commissioned research seem to be among the most common forms of cooperation and are, as it has been already mentioned above, the most important sources of private funds in general. There are several examples of good practice related to the cooperation of HEIs and the society: regional representation, framework for building cooperation networks promoting regional marketing and making a region more attractive to investors, facilitation of cooperation or knowledge brokerage between different institutions.

Out of total amount equalling to LVL 3.18 billion of the EU funding in Latvia for the period of 2007-2013, the funding for education is LVL 359 million (11%), including LVL 167 million (5%) for science and LVL 143 million (4%) for

Table 1

Structure of higher education financing in Latvia in 2007

1. State budget	60.6%	LVL 127.5 million	EUR 181.4 million
2. Private investments	27.9%	LVL 58.8 million	EUR 83.7 million
3. Other*	11.5%	LVL 24.1 million	EUR 34.3 million
Total	**100%**	LVL **210.4** million	EUR **299.4** million

* Other sources include: rent income, income from research, which is not financed by the state, and other income

Source: *Pārskats par Latvijas augstāko izglītību 2008.gadā* (skaitļi, fakti, tendences). Rīga: Izglītības un zinātnes ministrija, Augstākās izglītības un zinātnes departaments, 2009

innovations. These are no doubt significant investments in human resources and infrastructure that could provide a strategic breakthrough. There is also an opportunity of establishing infrastructure that in some fields could be competitive with HEIs in the old EU member states (Eglītis J., Paņina L. 2009).

The private investment into education with the use of some certain financial instruments (education credit, education insurance, and education valuable documents) is a rather popular practice in higher education of many world countries. In Latvia these mechanisms of financing are in the primary phase of development. All this shows the fact that the system of private investment in education itself has a perspective of development in contemporary Latvian economy. However, it is necessary to create the appropriate conditions for its formation and development. The political decisions are to be made on a transition to the principles of joint investment in education and consolidation into the new organising-economic mechanism of professional education. The economic conditions are to form financial instruments of *target storage* by the households for financing the education. The social ones are the formation and development of the middle class, as a wide solvent layer of society.

Funding strategies in future

At the moment education process experiences a difficult situation. The transition to dynamic education system itself is a difficult task. The analysis of the situation testifies that some transformations are necessary both in the education policy and in views about the education system. As it is mentioned above, essential transformations have occurred in Latvia in the 1990s, which had completely changed the society social, political, and economic structure, and had affected also the education system. In contrast education is the main tool for future formation.

What kind of society we would like to see in the future? We can plan a certain education system, which would develop in people corresponding qualities, knowledge, and behaviour models. However, it never happens in real life. Education system itself reacts to changes in the society, usually with delay, maintaining inertia and creating a certain time displacement effect, when teaching and learning process, content, relations forms reflect some previous period society reality and corresponding points of view, values, and needs (Vasiļevska D., 2006).

Governance processes of higher education institutions and funding possibilities are only one of higher education mainsprings. They characterise the situation only from one aspect. There is a string of other factors, which also influence the advance of higher education development scenarios:

1) funding and governance of HEIs;
2) internationalisation of higher education;
3) development of *e-learning* processes in the context of globalisation;
4) demographic tendencies;
5) migration policy;
6) climate change;
7) macro economic and policy and regional development.

The OECD survey "Trends Shaping Education" concludes that the system of education will be influenced by several factors: ageing of society, global challenges (planet overcrowding, migration, climate changes), globalisation of economics, changes in labour market, ICT, changes of social factors and values (*Trends Shaping Education* 2008). Nevertheless the influence of these factors on a certain state or sector might be different. The higher education system of Latvia has several short-term (reducing work places in public sector, reducing state expenditures) and long-term (ageing of society, free of charge tertiary education and job opportunities for graduates in EU countries, declining number of pupils at the secondary level due to demographic reasons) risks. The influence of these risks on higher education system can be evaluated in the future scenarios.[1]

We should remark that, with the exception of demographic tendencies in Latvia, economic (peculiarities of funding size, distribution and structure) and political (management model) factors could influence the further development of higher education system.

Most countries pursue a policy of supporting the diversification of funding sources. Central authorities encourage HEIs to seek new financial resources such as investments by private companies, contract research and other commercial activities, donations, loans, etc. The government of Latvia has recommended that HEIs should establish grant foundations based on donations and their earned revenue.

Traditionally dominating role of the government in financing and offering services in the sphere of higher education has its roots in some political and economic circumstances, which are different now. Developing countries rapidly move on from small elitist systems of higher education to the wide scope systems of education. Governments turn out not to be able to finance this widening process, and it leads to the deterioration of the education quality. Even in countries with the transitional economics, where universities and research institutes traditionally were having strong positions, the process of modernisation of higher education systems had come across difficulties due to the reduced amount of budget resources and competition with other branches for the means of budget resources. These processes liquidated the ability of governments to finance the system of higher education according to the same schemes, as it has been previously. And again, the inevitable result of it became a rapid loss of higher education quality. Although the majority of European national policies are now encouraging higher education institutions to rely increasingly on private sources of funding, direct public funding continues to represent a substantial share of the higher education budget. In 2003, within the 27 member states of the European Union, 79.9% of the funding for HEIs

[1] Plašāk par scenāriju veidošanu augstākajā izglītībā sk. Eglītis J., Paņina L. Tertiary Education in Latvia Today and Tomorrow. In New Dimensions in the Development of Society 2009. (CD) ISBN 978-9984-48-005-3

came from public sources. In five countries, this proportion was below 70%: Poland (69%), Cyprus (65.8%), Lithuania (61.8%), Bulgaria (55.2%), and Latvia (44.9%) (*Higher Education Governance in Europe,* 2008). The funding of TES in Latvia (as % of GDP) is one of the lowest in the EU (EU-27 average is 1.13%, for Latvia – 0.90%, Estonia – 0.91%) (*EUROSTAT* 2009). The share of public funding during previous years makes about 70% of total, while the share of private funding (30%) is comparatively high – only in six OECD countries it is higher than 30% (Vincent-Lancrin S. 2004).

Financial and economic crises of 2009 will bring radical changes not only into the amount of financial resources invested in higher education (both from the state and private sector), but also into the labour market: thousands will loose jobs in the public sector. Thus the macroeconomic policy may give a crucial impulse for the development of HE (demand driven higher education) in different ways. For example, supporting the business sector and promoting the stability of the labour market we can achieve also the development of higher education sector, of course, these forecasts are effective only in the long-term. In turn, financing separate, priority sectors of higher education and science, we may gain the opposite effect – the system would be gradually deformed, which has already happened with the excessive swelling of the block of social science. Under circumstances of limited budget means the EU co-funding can be used as one of possibilities in a number of study programmes connected with the development of competences of human resources and the development of infrastructure. Of course, management mechanisms of these means should be attentively evaluated both on the appropriation and application stages; otherwise the system might be disabled in favour of one or another participant of the system.

Thus manipulating both in direct and indirect way with one of scenario formative factors we can distinguish several advantages and also disadvantages of the system, which should be successfully used to overcome global recession and internal structural reform, in the result forming stable and at the same time flexible, qualitative, efficient higher education.

Conclusions and proposals

Nowadays European states are looking for new models of mixed funding for higher education. The main task is to find an optimal share of state and private funding, so that the involvement of the state could not only fix the flaws of the education market, but also ensure accessibility of higher education to wide layers of population. Moreover, while forming and adapting a new financial economic mechanism, it is necessary to take into consideration both external (compliance of the development of education with the state economy in general) and internal factors of the sphere. However, it should be mentioned that, in the authors' opinion, the main priorities, which would foster the development of HE funding in Latvia are as follows.

The first priority of the reform should be optimisation of the amount of funding. In order to keep the leading position of the state in the development of HEIs, it is necessary to gradually increase funding of HE from the state budget. It would ensure the quality and accessibility of higher education.

The second priority stipulates diverse use of financial sources. New funding approaches are based on the instruments of competitive markets, which attract resources from several sources. Transition from the state funding of higher education to diversified use of non-state financial sources is viewed as a global tendency in many states in the world. It is obvious that attraction of private finances rapidly enlarges possibilities and instruments of HEIs funding.

The third priority is to elaborate and adapt funding frameworks and instruments appropriate for private resources, otherwise, diversification of financial resources will cause pressure on household budgets, thus, leading to negative consequences (mainly decrease of accessibility of higher education). The main challenge is not only to enforce and develop the system of student crediting, but also to ensure work and development of other mechanisms, which would be aimed at re-dividing household budget finances in time aspect. The development of state subsidies, grants, education insurance and money saving schemes in the world are considered to be the mechanisms of achieving equal opportunities, which would allow ensuring accessibility of higher education to people belonging to different social layers.

The fourth priority refers to stimuli increasing the efficiency of HEIs. HEIs need stimuli decreasing their expenses, i.e. they have to find the most rational possibilities of using finances. It is necessary to elaborate a clear mechanism, which would determine that higher efficiency does not lead to the decrease of the quality of education. In this case, a lot depends on the legislative initiatives, because the current mechanism of budget formation does not foster growth of efficiency. In order to achieve the optimal use of resources, it is not enough to invest many resources (including financial resources as well) they should also be directed towards the right aims and should be organised in a more efficient way.

The fifth priority stipulates the transition from the direct funding methods to the indirect ones in the form of state subsidies, credits, grants and tax benefits instead of financing budget places. In spite of the fact that in the majority of countries the state investment is the basic source of funding, these means at present come through some other channels.

The least priority is to create performance based funding HE in Latvia, using students' results indicators, indicators of the evaluation of institutions, indicators of management and services provided to the university community, HE cost structure indicators and others.

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Municipal Education for Sustainability in Latvia: Self-experience and Sustainability Communication Process Prerequisites

Raimonds Ernšteins, Dr, professor
Department of Environmental Management and UNESCO Chair in Sustainable Coastal Development,
Faculty of Economics and Management, University of Latvia,
Raiņa bulv. 19, Riga, LV-1586, Latvia; E-mail: raimonds.ernsteins@lu.lv

Abstract. Situation in the field of education for sustainable development (ESD) in the municipal sector in Latvia could be described as still in the development and much wider and diverse application of municipal ESD need to be encouraged, especially in the local rural territories. This overview article will summarise and also exemplify some municipal ESD experiences gathered (incl. selection of the bibliography list) during the past decade at the Department of Environmental Management while there were developed and implemented related research and development (R&D) projects at municipalities.
Case study research applications as well as various surveys conducted during the mentioned period in Latvia do show that all diverse knowledge institutions and particularly universities are getting more acknowledgment by municipalities as their important partners for municipal sustainable development via enhancement of both local/regional research based on interdisciplinary and cross-sectoral approaches as well as pre- and in-service education/training elaborated as interactive and community based environmental education and ESD. Municipal sustainable development practice cases in Latvia evidence that appropriate application of collaboration research (e.g. university-municipality partnership research**)** as for preparatory stage and, especially, local conditions based **personal self-experience and community sustainability communication complementary** development as for facilitation stage of the municipal education for sustainable development (MESD) enhancement are securing real life based participatory learning-training processes at municipalities and, subsequently, also municipal development.
Key words: sustainable development process, self-experience, environmental and sustainability communication, municipal planning and development, collaboration management, university-municipality partnerships.

Introduction

Municipal sustainable development (SD) process and education for sustainable development (ESD) in general, but, especially at the municipalities, obviously are to be seen in close and mutual inter-linkage. In the case of Latvia we shall recognise, that different sustainable development action programme (SDAP) projects and activities do involve or at least do facilitate ESD and particularly municipal education for sustainable development (MESD) enhancement locally and step wise its dissemination further around, but not often are to be seen opposite – purposely developed ESD and introduced into municipal/ sustainability planning. Several active periods of ESD promotion in Latvia have been directly linked with initiations of particular international processes and documents – UN Decade of ESD (2005-2014), UNECE Strategy for ESD and, most effectively, after adoption of the ESD process development guidelines (Baltic Agenda 21-E) for the Baltic Sea region countries (2002) – unfortunately, having no long-term impacts for MESD, except isolated research and education/ training activities mainly by universities.

There is still an urgent need (Ernsteins R, 1998, 2002c, 2005b) for further/adult education/training (probably with ESD priority) to be theoretically and practically combined with practice of SD contents and processes in municipalities for both general system as well as specialised training programmes. Careful preparation is needed, particularly in the relation to the specific target groups and practical experiences to learn from. Distance education, including internet resources, are successfully developing and will have major influence in further education for municipalities in the coming years.

This overview article on MESD experiences in Latvia, being based on both SD practice oriented and theoretical generalisations background, is aimed to summarise R&D project developments achieved in the university-municipalities partnership by the Department of Environmental Management (DEM) of the University of Latvia during the past ten years (1998-2009) and covering two initial periods (testing and enhancement ones) of municipal SD development. Recommendations for MESD development in Latvia will be prepared on some short applications of theoretical conclusions taken from previous articles and abstracts published (see the bibliography list) and several, main approaches demonstrating, case studies, being illustrated here. The main concept being developed and widely tested during the mentioned time frame in Latvia has been set around the collaboration practice model of SDAP development and municipal implementation

(Ensteins R., 2006a), particularly stressing importance of the local development conditions based on personal **self-experience** facilitation and local traditions based community **sustainability communications** encouragement in their **complementarity** as for MESD. Collaboration governance approach is to be stressed also.

The main study methods applied are the case study research applications (consisting of at least on spot municipality studies, observations, document analysis, and interviews with local case main stakeholders), including, first of all, the self-development and analysis of SDAP and/or Local Agenda 21 (LA 21*)* projects, processes and related education programmes, designed and implemented by DEM as well as various performed SD surveys in 2000, 2004, 2006, and 2007. SDAP application projects in Latvia have been implemented in practice (on different level of self-governance with various success and further continuity) and also studied as municipal case studies allow to presume (Ernsteins R…) that for successful ESD nation wide establishment it shall be initially started very locally with emphasising, facilitating and spin-off developing of SDAP as well as carefully taking into account local traditions. Let us further shortly study the situation and some existing cases and experiences.

There is to be accounted wide range of sustainable development (also LA 21) pilot projects in various types of the municipalities in Latvia, e.g. worthwhile to mention cases in Riga, Jūrmala, Cēsis, as well as in Bārtava and the Northern Kurzeme regions. These municipal SD practices were gathered already in the second half of the 1990s and early years of the current decade (first municipal SD application period) which allowed to conclude (Ernsteins R., 2002a, 2006c), that a number of Latvia's municipalities have gained not only first experiences, but they have also really acquired the main knowledge and skills needed for SD planning and implementation, incl. development and testing of methods for public involvement and self-participation. Experiences acquired, both general SD process ones as well as specific locality based approaches and even some elaborated models (Ernsteins R., 2002d), were publicised (universities, Union of Self-governance) corresponding to the present development needs in Latvia for every individual, i.e. subsequently different municipalities.

Municipal experiences included all three traditional LA 21 application approaches, starting by top-down and bottom-up cases, and continuing by LA 21 centre intermediation as well as university-municipalities partnerships have initiated also some non-traditional cases of LA 21 application approaches – instrumental integration and disciplinarisation approaches (e.g. based on ecotourism as a tool and municipality development sector, Local School Agenda 21, and cultural heritage case with museum involvement as an approach, tool and mediation centre). General conclusion after those first comparatively positive SD implementation trials states (Ernsteins R., 2002a, 2006c) that municipal sustainability introductory process would take much longer time and, most importantly, innovative approaches and instruments, to begin really full scale implementation of LA 21, as significant changes are required in the everyday management of municipality activities, the identification and real involvement of all target groups, and securing the diversity of necessary resources, particularly, human resources.

These guidelines taken towards the second municipal SD enhancement period brought main stakeholders and, first of all, university-municipality partnerships to more specified and especially human resources developing sustainable development action programme (SDAP) projects (incl. emphasis on state required municipal development planning system instead of LA 21 approach). On the conditions when general interest on municipal SD processes in Latvia was slowing down, a collaboration practice model of SDAP development and municipal implementation (Ernsteins R., 2006b) was further elaborated and step wise tested as complimentary set of elements for sustainability governance and management facilitation:

1) collaboration/partnership research as start-up **precondition** and then project based SDAP development background;
2) structural network facilitation approach for LA 21 development as **framework structure** for process facilitation;
3) self-experience facilitation/approaches toolbox as activity **process development;**
4) four partite incremental environmental communication cycle as LA 21 activities **content development**.

Education for sustainable regional/local development is to be seen as interlinked and mutually beneficiary for both theoretical approaches elaboration and later implementation at various education levels, types and systems on the one hand and its local/ regional municipal practice activities development in Latvia on the other hand, which would be discussed ahead using some case examples.

1. Self-experience facilitation toolbox for MESD activity process development

The complementary set of ESD training approaches and methods based on a number of formerly wide known, yet now re-designed participatory education activities in the local practice of Latvia were compiled and tested during implementation of the university-municipality education/training projects and courses in Latvia in the 1990s (Ern teins R., 2002c,d). Municipal practice development oriented towards end product was designed, discussed, and evaluated in the self-planned various stakeholders participated group work meetings. The basic preconditions for the development of the so-called self-experience - experience acquired by stimulated active work of the individual at local conditions based facilitation/ training exercise at the same time being applied in the further acquiring of experience was formed there.

This kind of self-experience development tool-box was initially full scale tested during Bārtava SDAP model-project (Kudrenickis I., 2002c, 2004) and later municipal ESD training programmes and it

was recognised as being crucial for local population/ interested individuals and local experts/specialists/ decision makers initiative and participatory capacity step wise creation and further self-organised application towards local municipality development. Complementary work to be done and the must of local SD initiation regard creation of positive attitude towards innovations in municipalities so as to encourage local stakeholders and general public to accept the new ideas and opportunities – necessary climate of "interacting resonance and openness for action" (Ernsteins R., 2002e, 2006c). It shall be started with the situation study and evaluation (particularly collaboration research), consideration of the community and interest groups opinions and their participation as well as facilitating self-organisations of local initiative groups and corresponding project development, etc.

One shall recognise the following self-experience development tool-box components: self-active development and project ideas, community involvement wave and interest group's participation, local facilitation teambuilding and local expert's involvement as well as environmental communication emphasis (Ernsteins R., 2006c). Self-experience work would have to result in concrete local development ideas which the participants would come up with on the spot and immediately publicly present, i.e. discuss, thus leading to already formulated, and most importantly, practical results, namely project forerunners. Local facilitation team is to be encouraged as a well organised group of local activists working in close cooperation, and harmonious spirit, complimenting and supporting each other, consequently achieving more than if working alone, results of good quality, applying new and often unusual and originally jointly produced solutions. Complementary reinforcement of information, education and involvement of the community, examples of environmentally friendly activities and studies, and use of the specific local conditions based on formal and non-formal communication forms are those activities required to overcome the main local development obstacle.

Bārtava sustainable development case as self-experience bottom-up facilitation approach

After general approach introduction let us examine a concrete example of using self-experience development toolbox in the municipal cases in Latvia – elaboration and implementation of the first Sustainable Development Action Programme (SDAP) model-project (authors – R. Ernsteins, I. Kudrenickis, A. Builevics, G. Strele, 1998) in Bārtava region (nine local municipalities in the Southern Kurzeme region) as still in terms of content and volume the most thoroughly prepared and fully completed municipal sustainable development planning project. This SDAP planning and implementation process actually represents and, even more, triggers municipal education for sustainable development (MESD) process in the municipality for all main stakeholders and general public as well. The applied SDAP methodology elaborated for the project has been later more widely tested, and these approaches can be applied in any municipality in Latvia on any administrative level, but certainly, taking into account as minimum following two human resources development preconditions.

Once initiated, the existing process of self-activity and interest development in thus "activated" municipality could continue on its own by, sometimes even being not interconnected, gained self-experience further generated local activities or, at its best, could be further facilitated by any interested stakeholders, which certainly requires the following precondition – existence of such stakeholders and/or development work needed to secure presence at the municipality of such interested and as good as possible ready to act stakeholders. In Bārtava case it was initially done by grouping of this region schools and environmental education teacher's networking, but later by, the so-called, Bārtava region Environmental Management Council, having different project's based staff and, most importantly, all region municipalities as shareholders.

Unfortunately, this precondition is heavily depending on adequate human resources available very locally and being interested to be involved that in this region was a case for some 5-7 years as step-wise trained project staff got more interest in more challenging higher planning level projects and moved away, but new relevant and pre-trained personnel was not encouraged and prepared instead. Of course, this correlates directly with the second precondition – continuing positive attitude and feedback from particular municipalities as well as the whole Bārtava region leadership and officials, which is to be recognised as very important, but fortunately being not fully limiting one. In the current example of Bārtava post-project situation, those preconditions, actually, not requiring a great number of financial resources, were not properly dealt with and in combination with the following number of municipal leadership changes, one shall recognise that local sustainable development as well as education process initiated has been slowing down and SDAP, still used as background for development of new projects, has not been further widely integrated in the daily work of this region municipalities.

At the same time, self-experience approach application in Bārtava project could be and was further utilised, and at the first the author will look at the content and principles of the model-project, and shortly examine the main results achieved, as well as SDAP preparations and methods elaborated for this project. Methodology and implementation of the model-project were based on generally accepted sustainable development theoretical elaborations and on practically tested innovations in Latvia. Practical self-experience development building approaches being formerly tested at different level municipalities in Latvia, were selected as the foundation for elaboration of the model-project (Ernsteins R., 1995), particularly, in order to ensure broad and true-life public involvement and participation of all possible municipal partners and interest groups.

Looking at the set of the previously mentioned approaches and, taking into account the necessary

interaction for the application of these approaches as well, it could be said that the body of the approaches can be implemented most effectively exactly in this mutually complementary way, i.e. by adding to and improving the productivity of each approach (Kudrenickis I. et al, 2004). In all sustainable development related and/or training projects in Latvia's municipalities these seven complementary approaches could be rather simply but qualitatively enough implemented within the so called public target-groups self-experience seminars (within group works on the spot , by elaborating project ideas etc.), which are, of course, supplemented with a large volume of objective and subjective information, which, on its part, is to be obtained as collaborative research/inquiry projects, also by carrying out a broad (and personalised) sociological poll, preferably with the help/involvement of local experts, pupils, and other inhabitants.

The greatest effect in such self-experience seminars was obtained not only via participants group work on analysing and evaluating the local development aspects, concrete sectors and issues, but particularly by participatory elaboration of perspective sustainable development actions, i.e. via local practice based on end product-orientation. Namely, at the end of each seminar (either comprehensive version of 1-2 days or even better version of two legs seminar one day each part) participants left not only with positive satisfaction and future expectations after actively collaborating spent time and received partially self-developed handouts, but also with considerably raised self-experience during workshop (only facilitated by councillors) participatory process and cross-sectoral content studies – exchanged ideas, self-elaborated previously thought or brand-new projects as well as with new-found (often even previously known) persons who share the same views for SD planning and implementation of on-spot proposed and elaborated projects. This concrete and in local municipalities easily comprehensible practical project approach became to dominate in the model-project (and later widely spread too), since all SDAP were chosen and formed during seminars as discussed and prioritised project lists being grouped in all the main municipal sustainable development sectors. Such project ideas based on local SD action programmes are easily to be understood, and thus further prepared in order to be used in the municipal daily work either for planning of everyday activities or adjusting those project ideas generated to applications for concrete funding possibilities etc.

The quality of the achieved results in SDAP elaboration, taking into account sustainable development planning in municipalities in general, was ensured by the chosen practice methodology (incl. seminars with interest group participation in particular):

- integration of strategic planning and action planning approaches;
- mutual integration of the different, frequently separated municipal operational sectors in the planning process (in the seminar);
- elaboration of sustainable development indicators used for planning and measurement, and later evaluation of the achieved progress in the particular sector or whole SDAP context (preferably as visions and aims), especially, when utilising the indicators "bottom-up" development process (in community-initiated way);
- SDAP "bottom-up" planning process as pre-planned self-experience rising work.

In the case of Bārtava region SDAP model-project it was possible to use all the theoretical and practical experience together in one project – in implementation of the already mentioned self-experience approaches on local and regional level in Latvia – and the main steps were as follows (Kudrenickis I., 2004, Ernsteins R., 2002d):

- regional inhabitants' poll;
- elaboration of the municipality image – 2020 and sustainable development indicators initiated by the local community;
- elaboration of sustainable development indicators' list for the whole Bārtava region;
- SDAP elaboration in each regional municipality; and
- SDAP elaboration for Bārtava region.

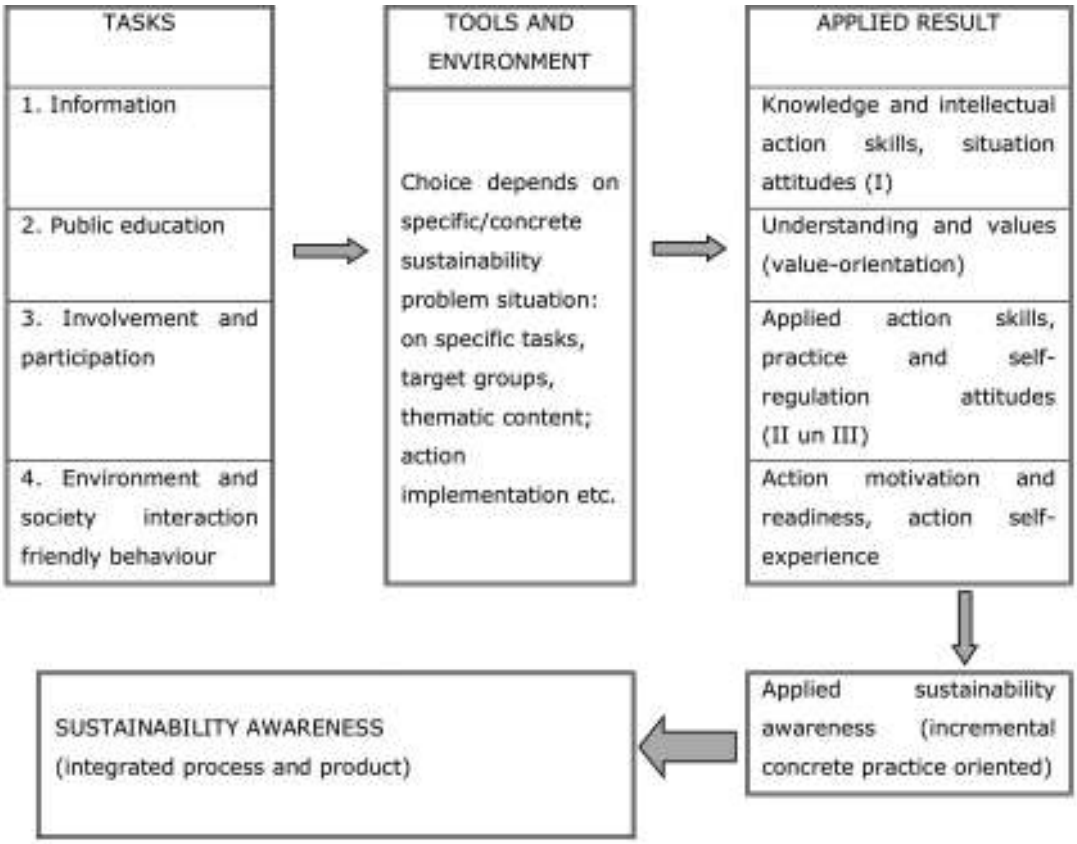
It is important to note that such model-project steps and concrete methods have promoted both previously expected and also brand-new municipal development activities. For example, after self-experience seminars separate interest associations have been established, the most active municipal experts have independently applied the methods of seminars, thus gaining new potential and different solutions in their municipalities etc. Also there are different other self-experience development activities further elaborated and applied in municipal SD since Bārtava project design and implementation, and so becoming widely accepted; however still not so regularly used in municipal planning and/or education/training work. Taking into account the above described Bārtava case it shall be recognised that municipal SDAP "bottom-up" participatory and interactive planning process creates and can sustain comprehensive MESD on the very local self-governance level.

2. Four partite sustainability communication cycle for MESD content development

Sustainability development problem solutions are not only strongly correlating with information and understanding of situation, and level of knowledge, but also with the sense of responsibility and readiness to act. Results of the assessment of different SD project cases and related activities and also public environmental awareness development in Latvia indicated the need not only for an environmental (Ernsteins R., 2006c, 2005a, 2007b), but also sustainability communication system and related process development with involvement of all main actors in the field – ministries and other public institutions, municipalities, general public and public organisations, business organisations, mass media,

Table 1

Incremental sustainability communication process – four partite cycle model (adapted from Ernsteins 2006c)



research and education development bodies and networks etc. Sustainability communication is then viewed as multilateral information exchange and **collaboration enhancement process** based on and including four following components: information, public education (target groups oriented), participation, and partnerships as well as environment and society interaction friendly behaviour.

Subsequently, the author proposed (Ernsteins R., 1997, 2002d, 2006c) initial sustainability practice cases based on **model of incremental sustainability communication or collaboration communication cycle approach**. The elaborated and in the municipal practice tested model (Table 1) demonstrates the linkage between sustainability communication tasks as the cyclic basic steps of collaboration communication components integration process and pedagogical/ practical results – ESD content components. Within the particular SD issue oriented cycle this ensures applied and concrete practical case based sustainability awareness components development**,** but within the multi-cycle integration it is complementary leading to the process of motivated **self-experience and personal SD practice** development, and so facilitating general sustainability awareness enhancement.

Appropriate sustainability communication results have been measured as knowledge and practical skills, understanding and ability to solve problems, up-to self-regulation attitudes, motivation and readiness for concrete action, and obtained experience for case related target groups as well as each individual in general.

National environmental communication strategy case as for sustainability instrumental facilitation

The whole community, incl. politicians still do face the environmental problems; however the level of information, professional education, experience and management skills and other capacities to participate and act are very different. Consequently the role of communication process is constantly increasing, but communication instruments are to be recognised as exactly those ones that may become the crucial tool for environmental and sustainability development (Strategy, 2000. Ernsteins R 1998, 2000d) The four partite incremental environmental communication cycle model demonstrates the necessity for all four basic elements and their direct and cyclic interaction within environmental communication process as identified in the definition and latter development of National Environmental Communication and Education Strategy (Strategy, 2000), which was elaborated during 1998-2001 and can be mentioned as one of the nation wide applications of this theory and practice based development. According to the

model of environmental/sustainability communication cycle objectives and tasks of the strategy were set, principles applied as well as target group's approach formed and elaborated with respect to their involvement content and methods.

The following main statements of environmental communication development situation at the end of the past century have been defined in the strategy (Strategy, 2000):

1) insufficiently coordinated circulation and complicated availability of environmental information, its inconsistency with the needs of different target groups;
2) low level of public education and understanding about the necessity of environmental protection and environmental problem solutions possibilities;
3) insufficient activity of community and other target groups as well as a lack of mechanisms for participation in decision making;
4) insufficient preconditions for implementation of environmental friendly life style and action of community and different target groups.

The aim of the Strategy (Strategy, 2000) was to ensure effective development of environmentally friendly public awareness, support different solutions of environmental problems, and set out effective framework for co-ordinated environmental communication and education in Latvia. The strategy and Action Programme should have crucially contribute to promote development of the environmental communication and education (EC&E) as tools for effective environmental policy implementation, environmental institutions public relations with different target groups and more effective environmental information demanding-offering feedback relationships.

The basic principles of environmental communication listed below set up the need for implementation of common state environmental policy through interaction and collaboration first with public and municipalities, and then also with all other stakeholders. The main principles of environmental communication were also grouped according to the four main communication cycle components (Strategy, 2000, Ernsteins R., 1997).

1. Environmental information circulation is to be ensured based on the following principles:
   - availability and credibility of information;
   - transparency and lucidity of information.
2. Public environmental education implementation principles ensure that environmental education comprehend the environment as the whole – through interaction between nature and human made environment. The following principles should be followed developing and improving environmental education in formal and non-formal education and on all levels of public administration:
   - continuity and succession of education;
   - inter-disciplinarity and integrity of environmental knowledge.
3. Ensuring of public participation is linked to the motivation for need of environmental protection, promotion individual and public interest, taking into account the following principles:
   - personal and professional responsibility;
   - collaboration.
4. Formation of environmental friendly everyday action is linked to the positive thinking, exploration of positive examples and making them public, thereby promoting the development of selected principles, corresponding normative mechanisms, and procedures. The principles to be followed are:
   - unity of action independence and responsibility;
   - "think – globally, act – locally".

Availability and participation of the particular target groups and their collaboration has a crucial role in the communication process both when preparing and implementing environmental policies. The main eight target groups (Table 2) have been identified and analysed in the context of environmental communication and public policy theory and, unfortunately, the formation process of different stakeholders groups is still continuing (incl. self-organisation), thus obviously being one of the aspects also hindering particular implementation of the main work directions assigned for the strategy today (Strategy, 2000):

- development of environmental and communication tools within the scope of ministry and its institutions competence;
- considering competence of other sectors and environmental communication and education integration into them as integration into the strategies, plans, programmes and projects of different ministries for different national economy branches and public sectors;
- delegation of appropriate functions and co-operation with NGOs, different forms and organisations of public representation, professional organisations, mass media etc.;
- co-ordination of co-operation among all target groups considering different competencies and levels of administration;
- the main tools are as always: legislative and normative acts, environmental protection system and infrastructure (including municipalities, NGOs etc.), planning and economic instruments, and again, but innovative, communication tools.

Education for sustainable coastal development – coastal communication practice case

Several coastal communication project products based on collaboration communication model of former and more non-traditional applications was elaborated during the Interreg project development in Latvia at the DEM (2005-2007) (Ensteins R., 2008a, 2009b). First and central project backbone activity related to coastal municipalities and local development oriented participatory seminars, implemented as collaboration partnerships between municipalities main target groups and university with jointly produced real time action planning guidelines for municipal coastal application**:** Carnikava

Table 2

National Environmental Communication and Education Strategy – content proposal (Strategy, 2000 adapted from Ernsteins R)

Definitions
1. Evaluation of environmental awareness development
2. Interaction between state institutions and public
2.1. Competence of state institutions and co-operation with public
2.2. Basic problems
3. Basic approaches for environmental communication and education
3.1. Aim and main tasks
3.1.1. Environmental information
3.1.2. Public education
3.1.3. Public participation
3.1.4. Environmentally friendly action
3.2. Basic principles
4. Main target groups for environmental communication and education
4.1. State institutions
4.1.1. Ministry of Environmental Protection and Regional Development and its institutions
4.1.2. Other ministries and institutions
4.2. Municipalities and their representing organisations
4.3. Residents
4.4. Business organisations
4.5. Non-governmental organisations
4.6. Mass media
4.7. Public education organisations
4.7.1. Non formal and adults education
4.7.2. General education
4.7.3. Vocational and professional education
4.8. Science and technology, higher education institutions
5. Environmental communication and education strategy implementation
5.1. Tools
5.2. Indicators and monitoring
6. Action Programme for environmental communication and education
7. Annexes

municipality case – Sustainable Development Action Programme; Saka municipality case – Integrated Coastal Policy Plan; Roja municipality case – Integrated Coastal Communication Policy Plan, and even Liepāja City case – Coastal Communication Action Programme. The package of information and education materials and resources to be further used as coastal communication facilitation instruments, particularly for coastal MESD was designed and developed based on those also called model seminars.

Coastal communication toolbox was elaborated consisting of complementary complex of coastal case studies and other materials (both – newly developed during model seminars and related to the main coastal issues, particularly, coastal communication approaches and elements as well as the analysis of existing experiences in Latvia). This set of necessary materials was further used for design and full development of distance education/training modules for coastal partnership target groups self-training on the main nature protection and coastal development themes: Nature environment, Social environment, Environmental management for municipalities, Environmental education, Municipal sustainable development management, and Environmental communication. Also electronic communication platform concept and design were developed in order to be introduced in future modern and nowadays already accessible in distant municipalities communication means both locally/nationally as well as internationally between next project partners initially and then all concerned with coastal communication in the region. E-platform could be further expanded to facilitate coastal SC and ESD via discussion, even common preparation of texts/projects and real time communication. This e-platform as well as other approaches and instruments utilised contribute to MESD.

Coastal communication action programme Guidebook and Handbook on coastal communication planning and management have been also step-wise designed, elaborated and tested during model seminars in coastal municipalities. Guidebook provides detailed version of four steps approach towards coastal communication action planning for municipalities via assessing and developing communication for main environs of human life cycle – household sector, learning and working sector, and public (municipal) sector. The integrated case of coastal communication management system was designed too. Handbook in

turn represents a whole set of resource materials to develop understanding on all coastal communication cycle elements – coastal information and education/training as well as coastal participation and partnerships, and environmental friendly behaviour – all were understood and applied complementary as leading to coastal collaboration practice established and awareness enhanced.

In the meantime several municipalities in Lavia – Cēsis (2005) and Liepāja (2009) towns and Līvāni (2008) municipality – converted and integrated these mentioned and other DEM models and experiences into their environmental and development planning process and products. Official environmental communication planning documents as separate sector or discipline of the municipality development planning were prepared and approved in collaboration with invited stakeholders. It shall be recognised as direct MESD development facilitation since requiring regular design and implementation of environmental and sustainability information and education, participation and behaviour change activities in the municipality everyday practice.

3. Sustainable development demonstration case as SD and ESD practice application

People from local municipalities often still suffer from the very sceptical attitude to everything new and slowly picking up new ideas, and the main challenge is to change the attitude of people with the methods of involving them in the communication and the decision-making process. Besides the main Regional Agenda 21 (as SDAP local practice) process development (within the EU Life project "Green Livonian Coastal Region 21" implemented in the Northern Kurzeme region 2000–2004) particularly elaborating existing and eventual conflict resolution and wide partnership and cooperation building. Sustainable development DEMO projects as the first case in Latvia for ongoing wide and long term positive examples/experiences dissemination and also municipal training development, particularly ESD were also designed and implemented there (Ernsteins R., 2003a, 2005a).

Let us mention only some and first – local SDAP planning and process management demo-projects package as partnership practice and public participation based on sustainable coastal region development process. The case study (Ernsteins R., 2003a, 2006c) results have permitted to conclude that a combined version of all four main conventional local SD process approaches, being tested separately and complementary (however with different degrees of quality fulfilment and later continuation perspective) as the fifth SD process development approach, namely, facilitation as structural network approach, could be recommended for further dissemination in Latvia. Components of this coherent whole approach were developed as a kind of regional sustainable development action programme (structural network):

- conflict resolution and partnership practice as an overall framework;
- round table forum and public participation as a bottom-up process;
- council for sustainable development of region as a top-down process for collaborative and integrative decision planning;
- regional *Agenda 21* centre as an intermediary facilitation and partnership coordination;
- rural communication and information network as well as regional sustainable development implementation demonstration projects etc. as an instrumental integration and sectoral development.

These elements of the coherent whole were seen also as both the main tasks and outcomes of the LIFE project. This applied research/project hypothesis has been appropriately demonstrated during project execution and purposely verified; however still wider demonstration and practice dissemination should have been done as real sustainability activities first time taking place in regional practice were challenged by some decision making bodies/personalities of the Northern Kurzeme coastal region and full scale project outputs further developments were hindered even the number of, particularly, non-formal and self-initiated activities, have got real continuation up to now.

Municipal demo-projects package – open public competition for the best sustainable development demonstration projects (four sites) was chosen and developed in the four main fields of Agenda 21 – nature environment, social, economic, and culture environments. Municipal demonstration projects were elaborated, according to the criteria worked out and taking into account results of public participatory seminars and public survey results, also after discussions and results of Round Table forum based on methodological study results by DEM. Basic principles of the sustainable development were taken as sustainable development demonstration criteria, which proved to be enough difficult to implement, but very good tool to test and use for ESD, e.g projects should have been developed as (Ensteins R., 2005a):

- environment friendly, incl. economy of the resources, choice of the best available technologies etc.;
- economically profitable – local resources shall be used in effective way;
- socially equitable – the needs and interests of the local inhabitants shall be respected at first as well as different social and professional groups etc.;
- culture heritage safeguarding – culture traditions, including mental heritage shall be investigated, used and renewed for the local development.

Besides the demonstration character (also as example of experience learning) each demo-project shall be innovative and contribute to the very local (local site) development in the meantime and favour the development of local/municipal territory and society in the future. There was also requirement to keep sustainable not only the any content work

(within economic, cultural, education, social, and environmental field as particular sectors and their interlinking) of demo-project, but also merely the whole infrastructure/supporting system of the demo-territory/objects.

Environmental and coastal sustainable development benefits as well as local drawbacks have been seen in every implemented demo-project unfortunately, either in some detail or in the whole application too. For the future of such DEMO developments and alike it is recommended not only to implement them as separate innovative demonstration projects, but to see and evaluate them as complementary sustainability elements package for the both local municipality SD and ESD practice.

Discussion and conclusions

SDAP process further development in Latvia and, subsequently, also municipal education for sustainable development besides traditional require the elaboration and application of innovative approaches and instruments. Basic preconditions (besides regular resources necessary) are to be developed – comprehensive applications of environmental communication model as incremental multi-component cycle and holistic stakeholder process within environmental management and sustainable development and education practice proves requirement for sustainability communication system thinking and related self-practice experience development as principal and complimentary component (Ernsteins R., 2006b,c). Exactly, various municipal SD cases prove that municipal SDAP "bottom-up" participatory planning process creates and sustains comprehensive MESD on the local self-governance level. Governmental activities, e.g. National Environmental Communication and Education Strategy and Programme as well as related municipal level activities (e.g. environmental communication plans or chapters in municipal environmental and/or development planning like in Liepāja, Cēsis, Līvāni) as top-down support framework approach are to be made together for coherent set with various regional/local self-experience development activities as bottom-up facilitation approach.

Expanding the implementation of university studies (as R&D) curriculum locally at and via municipalities and using all eventual tertiary studies interdisciplinary and interactive elements, which are to be integrated wherever possible, appears to be generally necessary and then required by both parties and subsequently could be recognised that university-municipality partnerships are seen as the important driving force behind enhancement of ESD and SD process itself in Latvia.

Approaches formulated and several case examples described above and various more detailed long term experiences gathered (DEM selected bibliography list) in municipal training/education on environment and sustainability management and also on ESD application cases itself, allow formulating some issues for further discussion and elaboration (full list available at Ernsteins R., 2005b) for both environmental management training/education and sustainable development/LA 21 training/education.

The following main approaches shall be mentioned. Education/training should be planned and implemented for close interlinking and mandatory integration with territorial /regional development requirements / interests, and, particularly, with emphasising, facilitating and spin-off developing of LA 21 etc. action programmes and sustainable development concept in general as well as, especially, prepared taking into account local traditions/ background in general terminology (titles etc.) and specialised marketing. It should be targeted very precise towards following main municipal target groups – politicians and elected municipal councillors; senior specialists, especially executive directors and planners as well as coordinators and administrators of municipal associations; environmental specialists from municipalities and regional environmental boards; municipal employees; municipal interest groups, e.g. NGOs, entrepreneurs, media, education, culture and health institutions, etc.; teachers and students; specialised municipal interest groups (land and forest owners, renters of municipal services, etc.); general public (youth, women and retired persons, etc.).

Basic principles and approaches designed for interdisciplinary and interactive environmental management/governance training/education could be almost directly transferred for MESD case, e.g.:

- complexity and entirety of spectrum for environmental/sustainability management content, particularly nature environment and social environment interaction;
- interlinking of biotic and a biotic together with anthropological social-economic and communicational structures;
- complimentarily of state/public and municipal, household and corporate as well as regional and international environmental/sustainability management dimensions;
- functionality of strategic/policy and planning, programming and projecting (4P) levels of environmental/sustainability management;
- disciplinary and integrated environmental/ sustainability management implementations;
- necessity of environmental/sustainability awareness development of specialists and public through environmental/sustainability communication – information, education, participation, and environmentally/sustainability friendly behaviour;
- applicability of monitoring, evaluation, planning and decision making implementation functions of environmental/sustainability management.

ESD according to the experiences with sustainable development management as well as environmental management development continuously requires: encouraging dialogue; creating mutual agreement among all process stakeholders; ensuring formal/ informal cooperation; facilitating everyday practice change; and disciplinary-sectoral approaches as complementary to instrumental ones respond. Finally, of course, it should be summarised that

all conclusions above as mentioned on education/ training approaches/principle, shall be considered as coherent whole and implemented into practice when approaching new training developments.

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Theoretical Aspects of Lifelong Learning in the Context of Socio-Economic Processes and Development of Human Resources

Aija Sannikova, Mg.paed., PhD student, Latvia University of Agriculture
Aina Dobele, Dr.oec., associate professor, Latvia University of Agriculture

Abstract. The analysis of theoretical literature displays that the notion "*lifelong learning*" has no precise definition, it is many angular and contradictory, and it has several aspects and definitions. The paper characterises the essence of lifelong learning in the context of socio-economic aspects and development of human resources. The research reveals that the increase of individual competitiveness and promotion of employment are the most essential arguments for individual participation in the lifelong learning process. Labour market demands for human knowledge and skills change simultaneously with the technical scientific progress and economic changes, thus people continuously shall acquire new skills demanded in the labour market. Theoretical literature views lifelong learning as process, individual activity, sphere of activities, education system in general, or key principle of education policy, and it plays the main role in the sphere of human resource development. Successful development of lifelong learning enhances the development of socio-economic processes in the state and promotes the formation of information and knowledge society.
Key words*:* lifelong learning, human resources, employment, knowledge society.

Introduction

Since the 19th century changes in the economic model from agrarian economy to industrial economy have occurred in compliance with the world economic development tendencies. Presently developed countries experience substitution of industrial economy with knowledge economy, which characterises itself with high share of innovation-based services in the Gross Domestic Product. Service development is impossible without the development of human resources. Also in Latvia the development of human resources is actually the only possibility to expand economic potential of the country due to relatively small number of population and limited availability of natural resources (Mūžizglītības politikas pamatnostādņu…, IZM (2009).

The political documents of Latvia recognise *knowledge* as the key *growth resource* of Latvia, while the goal of growth is an increase in *the quality of human life*. Latvia population shall receive education that ensures integration into the labour market, active participation in the civil society and personal growth (Latvijas Nacionālais attīstības…, 2006).

At the beginning of the 1990s both the European and Latvian economies met with rapidly changing types of production, trade, and investment. These changes messed the balance in the labour market and led to a high level of structural unemployment. Hence it caused a situation leading to a shortage of specialists having certain qualification, while the acquired skills did not any more comply with the labour market demands and situation. The quality of human resources depends on the education level of employees, their professional and general knowledge and skills, state of health, culture (Garleja, 2006), ability to be innovative and creative, and other components. Therefore lifelong learning as a framework of education system shall ensure the development of human resources in the country on the whole and equalisation of differences among regions (Vadone, 2006).

Individual adaptation of humans to the international labour style is slow (Schmitt, Partner, Kuvik, Hrapkova, 2005), thus efficient measures are urgent, among them in lifelong learning, to promote a successful competitiveness of individuals on globalisation conditions both on local and international labour markets. *Lifelong learning* is a significant means to ensure sustainable knowledge, skills and competences of an individual for work, civil partnership and personal growth.

Although the notion "lifelong learning" is very widely used both in scientific researches, government regulatory and planning documents, and mass media, the content of this notion is many angular and unclear. Thus the research **aim** was determined to characterise the essence and role of lifelong learning in the course of socio-economic processes and the development aspect of human resources. The research **hypothesis** – formation and development of lifelong learning notion were caused by inconstant economic processes determining continuous human education for the formation of new knowledge, competences and skills in compliance with the labour market demands.

The following **tasks** are advanced to achieve the set aim:

- to analyse theoretical aspects related to the formation of lifelong learning notion and conditions for its development;
- to assess the role of lifelong learning in the development of socio-economic processes and human resources.

The research paper is developed based on the studied sources of theoretical literature and analysis of statistical data (employment, quantitative and structural indicators characterising population, job vacancies).

Results and discussion

1. Theoretical aspects of formation and development of the notion "lifelong learning"

Application and process development of the notion "lifelong education" has radically changed the theory and practice of education. Although the roots of the notion "lifelong education" do not relate with a concrete date, event or person, yet some authors consider the works of Eduard Lindeman (1885-1953), an American scientist and Basil Yeaxlee (1883-1967), a British scientist published in the beginning of the 20th century to lay the contemporary philosophical basis for the notion "lifelong education".

In 1926 Eduard Lindeman's book "The Meaning of Adult Education" was published, where he revealed new educational approaches: education is life and the whole of life is learning, therefore an education can have no endings.

In 1929 the notion "lifelong education" for the first time was explicitly used in Basil Yeaxlee's (1883-1967) written work "Lifelong Education" (Yeaxslee, B.A., 1929). There is also an opinion that the development of lifelong education concept was initiated by P. Lengrand report at the UNESCO Conference in 1965. The report emphasises lifelong learning, later called the LLL theory (Lassnigg, 2009), to be based on a humane idea that a person stands in the centre of any process of education, and consequently adequate conditions for the development of human skills shall be established throughout the whole life. Such an approach altered traditional breakdown of a human life – learning stage, working stage, and professional deactivation. According to P. Lengrand, lifelong learning is a process lasting the whole life, where an individual's integration into the society and personal development aspects play a vital role (Беляков, Вахштайн, 2006).

Nevertheless lifelong learning concepts offered by E. Lindeman, B. Yeaxlee and P. Lengrand won a wide response, though the notion of lifelong learning was completely developed only in the 1960s (Field, 2001), and it relates back to the radical intellectualism of students' movement – they demanded new forms of education promoting variety, diversity, and individual freedom (Young, Rosenberg, 2006).

Already in 1995 the European Commission emphasised in its papers the fact that lifelong learning enhanced employment and raised economic competitiveness. Starting from 1996 when the Council of Europe and the European Parliament established 1996 as the European Year of Lifelong Learning (the year of LLL) they simultaneously launched a transfer to continuity of education or lifelong learning. At that time the notion "lifelong learning" appears in the working papers of three organisations: Organisation for Economic Cooperation and Development (OECD), UNESCO and the Council of Europe having different names: recurrent education, permanent education, and adult education. Initially the following terms were used as "lifelong education" and "recurrent education" (Schuetze, 2004), though later they were replaced by a term "lifelong learning". The Council of Europe used a term "permanent education" in its documents. The year 1996 as the European Year of Lifelong Learning showed the existing extent of interest and maturity for lifelong learning on all the levels, and it helped influence the political attitude in the EU member states (Mūžizglītības memorands …, 2000), though since 1998 the notion of lifelong learning has been related to the European *employment* policy.

Even within a country the notion of lifelong learning may have several explanations and contextual meanings. S. Belakov and V. Vahstein (Беляков, Вахштайн, 2006) believe that terms having different names, like, ongoing education, continuing education, recurrent education, adult education, permanent education, and lifelong learning are usually used in the same meaning.

The notion of *recurrent education* for the first time in the political area was used by Olof Palme, a Swedish Minister for Education, in 1968 speaking at the meeting of the OECD (Organisation for Economic Cooperation and Development) countries in Versailles. The term "*lifelong learning*" is frequently used as synonym for already mentioned notions like "*adult education*", "*permanent education*" and/ or "*continuing education*". In France, Germany and Spain a term "*ongoing training*" (lifelong learning) is used instead of "*permanent*" or "*continuing education*". In English a new word with broader meaning "*lifewide learning*" has been derived from the term "*lifelong learning*", while in Latvian a similar term with broader interpretation is not common.

2. Essence and definition of the notion "lifelong learning"

In 1997 the European Commission and the EU member states defined lifelong learning *as targeted activities aimed at learning and performed independently with the aim to improve knowledge, skills, and competence.*

K. P. Cross (1981) calls the notion "*lifelong learning*" as tricky, very inconcrete and having different interpretations, while N. Kokosalis (2001) believes that there is no and may not be one general definition of lifelong learning, since there exist various approaches to the definition of lifelong learning. H. Siebert (2009) relates lifelong learning with adult education, but L. Lassnigg (2009) comprehensively views the concept of "three L" (LLL) and lifelong learning paradigms in the new era. Although there is no harmonised definition saying what exactly lifelong learning is, the policy makers have assumed that lifelong learning is extremely significant to satisfy constantly growing employers' demands for employees' skills (Jenkins, Vignoles, Galindo- Rueda, 2002). K. P. Cross (1981) esteems lifelong learning a process, where a human develops his/her knowledge, skills and attitudes throughout the whole life. He defines lifelong learning as "self-driven development, which means the understanding of a person him/herself and the surrounding world. It means to acquire skills and abilities – the only really genuine values, which can never be lost. It means – to invest into oneself; lifelong learning means to enjoy discovering, feeling that a person can succeed in something, starting be aware of a

new beauty in the world, creating of something or together with somebody" (Koķe, 1999). Lifelong learning is also regarded in the social development process continuously supporting human potential growth, fostering personal development at any age, developing knowledge, skills and attitudes necessary for working life and civil participation (Powley, Kennedy, 2005).

N. Kokosalis (2001) defines lifelong learning as new forms of teaching and learning preparing students (individual persons) and establishing competences for different activities, and including learning and life experience. In some cases lifelong learning is regarded as an offer of education to different groups of population, while in other cases it is esteemed as activity integrating into higher education. In several countries adult education is understood as *lifelong learning* (Kokosalis 2000, 2001).

The Concept of Education Development for 2007-2013 (Izglītības attīstības koncepcija…, 2006) as one of the most significant strategic documents in the sphere of education in Latvia defines ***lifelong learning*** as *process of education throughout the whole human life, promoted by inconstant public needs and the necessity of adults to acquire knowledge, skills and competences, and experience as well as to improve or change the qualification.* It comprises formal, informal, and everyday learning.

The essence of lifelong learning means:

- ***change of the understanding on traditional learning;***

A human studies not only in the meaning that s/he acquires new knowledge and skills, but simultaneously with the acquisition of knowledge and skills s/he gets ready for the acquisition of knowledge also in the future, since s/he is aware that the already acquired knowledge and skills may not be useful in the future, as the need for the acquired may rapidly change in the near future. Temporality has become a hallmark for the already acquired knowledge and skills (Ya-Hui Su, 2007).

- ***essential changes in the structure of learning;***

The post-modern paradigm of learning envisages that things we study are secure only at the current period, and we have continuously study anew (Mezirow, 1996). Success of learning hides in a human ability to study flexibly on the conditions s/he is forced to encounter in a real life, and not to study basing on definite stable models. Learning in the post-modern times shall be individualised (Ya-Hui Su, 2007).

- ***especial approach towards adult education.***

K. Young and E. Kelly (Young, Rosenberg, 2006) believe that the notion lifelong learning comprises activities **enabling and comprising potential to ensure useful learning for aged adults**. Introduction and expansion of lifelong learning is one of the ways to improve social conditions of aged adults, the adults whose status is shaken frequently due to modernisation. Modernisation has become a governing power destroying social status and mightiness of aged people (Cogwill, 1986). Hence in relation to social interaction the social exchange theory applies the "cost-benefit model" envisaging that exclusion and social isolation of aged adults is not the result of their individual position or wish, but the result of unequal exchange between aged adults and young members of the society as well as the necessity of aged members to maintain resources diminishing them and social impact in relation to their most significant needs, activities, and relations (Young, Rosenberg, 2006). Modern education and teaching systems shall be adaptable to individual needs and requirements of population and not vice verse. There will always be a contradiction between those who can find and adequately use lifelong learning possibilities and those who cannot.

The three main aspects of lifelong learning (Cropley, 1981; Schuetze, Slowey, 2000) are as follows:

- *lifelong learning* (here not only the years forming a person's education and the fact how this experience impacts a person's learning skills are emphasised, but also his/her motivation to participate in the further process of learning);
- *lifewide learning* (in spectrum) – means that education is provided both inside and outside formal education institutions, all types of education are considered as individual learning growth;
- *individual motivation* – to engage in education after mastering compulsory education (in case a person's education experience has mainly been negative, the probability that a person would be motivated to be engaged in an optional lifelong learning is reduced) (Young, Rosenberg, 2006).

Also the approaches towards definition of lifelong learning differ:

- lifelong learning is all targeted activities constantly undertaken by a person to improve his/her knowledge, skills and abilities in personal, civil, social, or employment related perspective, while its aim is assurance of persons with essentially and necessary elements to contribute to the modern society (Colardyn, 2004, p. 546);
- lifelong learning is a further development of knowledge and skills (Final Report of the Scottish Parliament on Lifelong Learning in 2002);
- lifelong learning is a pragmatic necessity to improve labour skills for economic competitiveness (Kumar, 2004);
- education throughout the whole life of a person, which is based on the necessity caused by internal needs or external factors to acquire and perfect his/her knowledge and skills all the time (Izglītības attīstības koncepcija …., 2006);
- continuous result related process to mastering education throughout the whole life of a person (Izglītības terminu skaidrojošā…, 1998);
- lifelong learning – education throughout the whole life of a person, which opens up opportunities to every member of the society to improve one's qualification or to obtain another qualification in compliance with the labour market requirements, personal interests and needs. Lifelong learning combining both formal education and informal learning enhances valuable personal development and enables a

person to adapt more successfully to the new changes of the time and social changes (Kas ir mūžizglītība?..., 2007);
- lifelong learning is considered as a way for achievement of socio-economic development, and it is assumed as instrument for promotion formation of the information and knowledge society (Kokosalis, 2001).

The results of these theoretical studies lead to the conclusion that the notion ***lifelong learning*** is many angular and it may be studied as:
- *process*, during which people of different age acquire new knowledge and skills in the most efficient way (applying new approaches and methods), and this knowledge and skills help them socialise in the society and compete successfully in the labour market;
- *individual activities*, resulting in the satisfaction of personal wishes and needs, and increase of a set of personal working capacities and characteristic features, capacity, creativeness, and it becomes a basis or precondition for accumulation of new knowledge and skills;
- *sphere of activities*, focusing on the operation of different institutions (schools, higher education institutions, teaching, and learning centres, etc.) and persons in the framework of these institutions;
- *education system* in general, which comprises all forms, types and stages of education, where an individual acquires competences valuable for him/herself and the society;
- *basic principles of education policy* in a contemporary single European Education Area.

3. Goals of lifelong learning in the socio-economic aspect

Lifelong learning comprises the cooperation of the education sector with other governmental and non-governmental sectors, development of professional education in compliance with fluctuating labour market demands, provision of education quality and availability to all groups of population, updating of the education content of all types and education at all levels (including adult education, professional education, and continuing education), activation and training of educators (Eiropas Savienības nodarbinātības….., 2005).

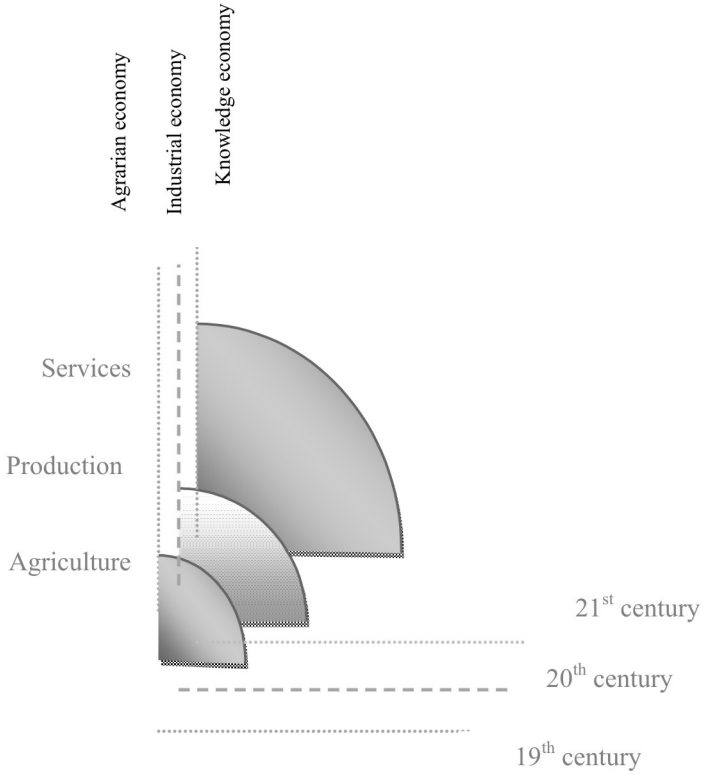
Lifelong learning is an especial system helping individuals develop valuably and find their place in the world and society, and it enables more successful adaptation to the new social changes and changes of the time. Socio-economic conditions, scientific and technological progress states that any of us shall learn throughout the whole life and actually all the time running (Ostrovska, 2006). Human is in the centre of lifelong learning. His/her reasons to be engaged in lifelong learning either periodically or continuously are quite different. Most frequently mentioned motives relate to labour and personal development (Merriam, Caffarella, 1999; Lam, Brady, 2005). Pretty often the process of modernisation causes structural barriers for lifelong learning, especially economic and behavioural obstacles, which enable a limited participation in mastering education. Motives (reasons, barriers) for not participation in lifelong learning may be divided into two groups:
- external or situational motives – lack of resources, time, or information, unfavourable geographical location etc.,
- internal or dispositional motives – lack of interest, poor health, unwillingness to spend more time out of doors, or following the values of those social groups an individual belongs to etc. (Young, Rosenberg, 2006).

N. Kokosalis (2000, 2001) names in his opinion three main **goals of lifelong learning**, which are not always compatible: *personal development*, *social cohesion and economic growth*.

The goals of lifelong learning may be quite different (Preece, 2006):
- to enhance the life quality of an individual and social welfare (Final Report of the Scottish Parliament on Lifelong Learning in 2002) (Final Report on Lifelong…, 2002);
- to promote an open economy in order to increase the national competitiveness in compliance with the impact of history and culture on public and individual needs (Singapore's approach towards lifelong learning) (Kumar, 2004);
- democratic citizenship combining individuals and groups, structures of social, political and economic activities both in the local and global context (Aitcheson, 2003);
- availability of education and formation of competences of every person regardless of his/her place of residence, age, social status, and nationality (Latvia's approach) (Mūžizglītības politikas pamatnostādnes…, 2007).

The European Commission working paper A *Memorandum on Lifelong Learning* (2000) determines the introduction of lifelong learning in the best way forward:
- to build an inclusive society which offers equal opportunities for access to quality learning throughout life to all people, and in which education and training provision is based first and foremost on the needs and demands of individuals;
- to adjust the ways in which education and training is provided, and how paid working life is organised, so that people can participate in learning throughout their lives and can plan for themselves how they combine learning, working and family life;
- to achieve higher overall levels of education and qualification in all sectors, to ensure high-quality provision of education and training, and at the same time to ensure that people's knowledge and skills match the changing demands of jobs and occupations, workplace organisation and working methods;
- to encourage and equip people to participate more actively once more in all spheres of modern public life, especially in social and political life at all levels of the community, including at European level.

4. Economic conditions for lifelong learning development



Source: Mūžizglītības politikas pamatnostādņu…, IZM (2009)

Figure 1. **Development of the world economics**

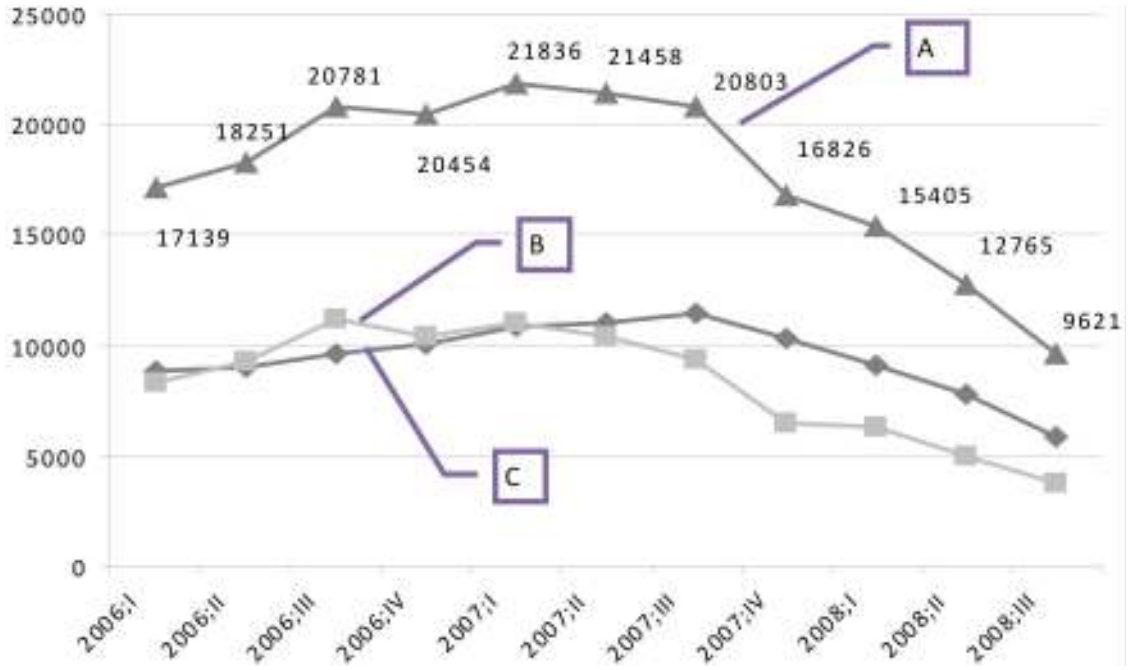
Modern world enters the era of new economics (Djoni Wesida, 2003), which is called teaching and learning economy (Field, 2000; OECD, 2000), knowledge economy (Kessels, Keursten, 2002; Tapscott, 1996), information and globalisation economy (Castells, 1998), or knowledge society (Karnīte, 2007; Drucker, 2001; Wesida, 2003). The new economics is based on knowledge – the key production resource and source for successful competitiveness (Field, 2000; Nonaka, 1996). In the knowledge economy intellectual labour gradually replaces physical labour (Castells, 1998), and "value added will be created by means of brain not muscles" (Tapscott, 1996, p. 7); thus promoting employment of all those who are ready to be engaged in a continuous education (Drucker, 2001) or lifelong learning, which increases their abilities (Kessels, Keursten, 2002) to create improvements and innovations (Wesida, 2003).

Knowledge economy is characteristic by the disappearance of differences between labour and learning (Tapscott, 1996), and labour environment becomes the main source of information for the formation of new knowledge (Kessels and Keursten, 2002). Learning is an important element of the production process, since it originates preconditions for the generation of new knowledge (OECD, 2000) (Wesida, 2003).

Lifelong learning links to economic processes have changed from mediated to direct links in professional education and higher education, which in turn cannot be separated from the science (Dzelme, 2007). The economic growth of every country is influenced by four factors – labour force resources, natural resources, capital, and technologies. The experience of developed countries shows that namely the accumulation and promotion of human capital is the first incentive for the economic growth, while physical capital plays a secondary role. Human capital is obtained through educating people aimed at increase of productivity; otherwise human capital is needed for generation ideas (Čurkina, 2003).

Direct and indirect contribution to education fosters the economic growth increasing productivity and creating preconditions for inner development. G. Becker (1964) indicates on the theory of human resources showing that private entities and companies investing in education and training correspondingly increase income and labour productivity. There is an assumption that the establishment of permanent professional skills, being one of lifelong learning aspects, has become very significant for those already have joined the labour market to satisfy employers' demands for new skills.

Gross Domestic Product is one of the most important economic growth indicators. Many direct and indirect factors, including total population, number of employed persons and labour force quality impact the GDP growth. Possibilities for production output may increase due to more resources having higher productivity. Although physical capital is an urgent factor for production development, knowledge and human resources are considered as the main growth factors. Investment into physical capital, costs



(**Legend:** A-total, B- private sector, C-public sector)
Source: made by the authors according to the Central Statistical Bureau data

Figure 2. **Job vacancies in private and public sectors in Latvia for the period of 2006-2008**

of education and research provide the information on total capital increase in a region (Chelwing, Kronberg, Schuller, 2007). The achievement of high production productivity requires a coordinated action in the sphere of human resource development (Mellahi, Wood, 2001). The introduction of lifelong learning policy may fulfil this function to a great extent, thus providing the possibility to keep in step with the world-scale competition and problems caused by fast technological and organisational changes (Lee 2006).

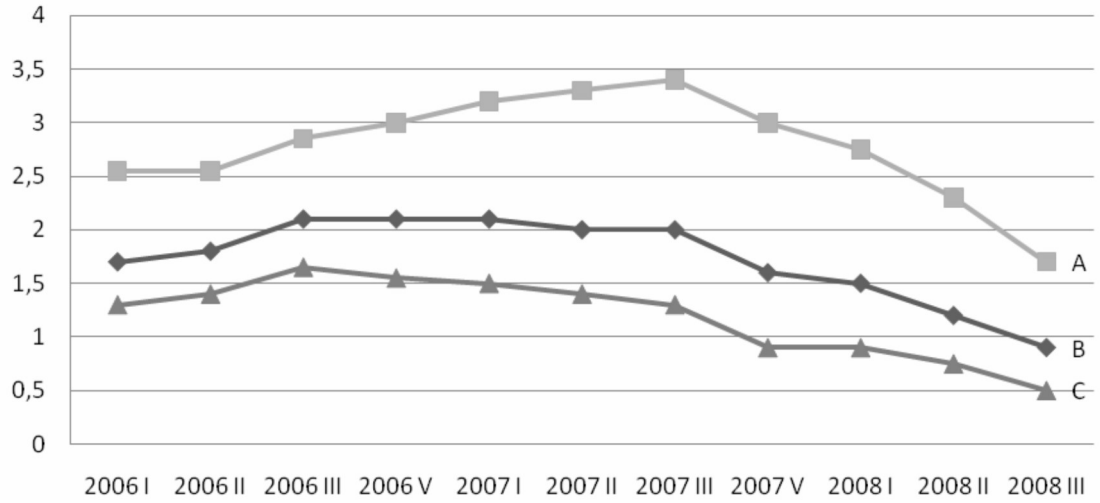
In compliance with the European Memorandum on Lifelong Learning, it may not be viewed only from education or training aspects. Lifelong learning has several economic and social conditions:

- Europe has moved towards a knowledge-based economy. Access to up-to-date information and knowledge, together with the motivation and skills to use these resources intelligently on behalf of oneself and the community as a whole, are becoming the key factors strengthening national competitiveness;
- education throughout the whole life helps people maintain economic competitiveness and employment;
- lifelong learning in its broadest sense provides the possibility to live in cultural, ethnical, and language diversity.

T. Koķe (2009) believes that it is essentially to assess the role of lifelong learning in the modern society and search for the best solutions for its development. It is essential for the society to distinguish the advantages and improvement of material welfare ensured by the abilities, improved skills and social contacts gained directly through adult education and lifelong learning. Recently (Kokosalis, 2001) lifelong learning has become a significant goal in education policy both on the national and international levels. Frequently it is **considered as way to achieve socio-economic development, and it is assumed as instrument for promotion establishment of the information and knowledge society.**

Growing competition and labour force demand changes in the labour market are one of the most fundamental arguments to continue education throughout the whole life. This argument specifies ***employment*** as one of lifelong learning spheres of influence; however its topicality refers not only to unemployed persons and job-seekers. In 2001 the Report of the international commission to the UNESCO states that people shall return to education to overcome new situations arising in their personal and working life (Delors, 2001). Another important argument for the development of lifelong learning is the ***compliance of*** working age population ***competences with the labour market requirements***. Unemployment and job vacancies are the results of incompliance of general and professional competences.

The analysis on the number of job vacancies (Figure 2) in Latvia for the period of 2006-2008 shows that in Quarter 3, 2006 the number of job vacancies in the private sector exceeded the number of job vacancies in the public sector by 16%. The largest number of job vacancies during the period analysed was observed in Quarter 1, 2007 equalling to 21 836 job vacancies, of which 10 824 job vacancies (49.6%) were in the public sector and 11 012 job vacancies (50.4%) were in the private sector. Starting from Quarter 2, 2007 the number of job vacancies in Latvia is decreasing. In



(**Legend:** A- public sector, B- Latvia, C- private sector)
Source: data of the Central Statistical Bureau; occupied jobs and job vacancies, paid working hours

Figure 3. **Structure of job vacancies in public and private sectors in Latvia for the period of 2006-2008, %**

Quarter 3, 2008 the fastest decrease in the number of job vacancies was seen in manufacturing industry – by 73.0%, public administration – by 54.7%, and transport, storage and telecommunicatio sector – by 51.0% compared with the respective previous period. At the end of Quarter 3, 2008 the largest number of job vacancies was observed in the public administration – 2.0 thousand, transport, storage and telecommunication sector – 1.5 thousand, and manufacturing industry and commercial services – 1.1 thousand each. The comparison of the data for September, 2008 and Quarter 3, 2009 leads to the conclusion that totally 233.9 thousand jobs were liquidated during the period, thus reducing the number of occupied jobs by 22.8%. Among them the number of jobs in the private sector has decreased by approximately 190 thousand, while in the public sector comprising public and municipal institutions and commercial companies the decrease has equalled to 44.1 thousand jobs. The largest decline in job vacancies was experienced in the sphere of professional, research and technical services, where the decrease constituted approximately 91% between Quarter 3, 2008 and Quarter 3, 2009. The number of job vacancies also rapidly decreased in manufacturing industry (by 85.4%) – in Quarter 3, 2008 job vacancies equalled to 961 jobs, while within a year the respective figure was 140 jobs. According to the Central Statistical Bureau manufacturing industry and mining is the only sector, where the number of job vacancies has increased, thus in Quarter 3, 2008 it offered 6 vacancies, and in Quarter 3, 2009 – 9 vacancies. Totally 2018 jobs were available at the end of Quarter 3, 2009. The majority of job vacancies were in the following spheres: public administration and defence, transport and storage, health and social care, and education.

According to the Central Statistical Bureau data for the period of 2006-2008 the share of job vacancies in total number of jobs was higher in the public sector (Figure 3). From Quarter 3, 2007 the share of job vacancies started to decline due to the changes in the economic situation.

At the same time a gradual growing tendency of unemployment rate both in Latvia and the EU has been observed since June, 2008. In Latvia according to the Central Statistical Bureau data in June, 2008 the unemployment rate was 6.4 %, while in June and August, 2009 it reached already 17.2% and 18.3% respectively. The EU unemployment rate equalled to 6.9% in June, 2008, and 8.9% and 9.1% in June and August, 2009. The unemployment rate grew globally. According to EUROSTAT data in August, 2009 the unemployment rate in the USA was 9.7%, while in Japan – 5.7%. In Latvia the existence of job vacancies parallel to unemployment indicates on the shortage of qualified labour force in the sectors of national economy.

The world has experienced fast changes during the past 20 years that are mainly influenced by scientific and technological progress. Constantly growing development of information technologies, globalisation of the national economy, increase of the share of services in the GDP, and the development of knowledge intense economic sectors pose new requirements in the sphere of human resource development and social policy (Benfelde, 2004). Lifelong learning shall foster formation of population competences in all types and stages of educational activities. Fast introduction of technologies in everyday life and production processes, national fight for market outlets, necessity for new, innovative products and other processes have determined the need for a flexible reaction towards the changes in goods and services demand, and therefore for adaptation, increase and improvement of general and professional qualifications of labour force throughout the whole life. Lifelong learning is considered as milestone of the EU policy in the sphere of human resource development, though human knowledge

and skills play a decisive role in the information society to achieve high level of welfare.

Promotion of the national economy and the GDP growth, growth of the living standard, increase of employment, and enhancement of competitiveness of production output on the world market by introduction of innovative technological solutions require significant investment in human resources – developing lifelong learning according to the short and long-term individual, regional and economic needs.

Conclusions

1. The notion of lifelong learning is new; it was established only in the 1960s. It has several definitions, yet in general it is a process of education lasting throughout the whole life, where integration of an individual into the society and personal development play a significant role.
2. Human is in the centre of lifelong learning, and his/her motives to engage in lifelong learning either periodically or constantly are connected with work and personal development.
3. The notion of lifelong learning is related to the EU employment policy, since it is a pragmatic necessity to improve labour force skills for the development of economic competitiveness.
4. Lifelong learning has direct links to the economic processes, as the process of the knowledge economy requires permanent formation of professional skills to satisfy employers' demands for new skills.
5. In Latvia the unemployment rate has gradually increased since June, 2008. In August, 2009 it already reached 18.3%; however there are still job vacancies. The existence of job vacancies parallel to unemployment indicates on the shortage of qualified labour force in the sectors of national economy.

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Participatory Clarificatory Evaluation of a Human Ecology Curriculum Renewal for Sustainable Integrative Community Development

Cornel Hart
MPhil – Social Science Research Methodology
Lecturer, the University of the Western Cape (UWC) South Africa

Abstract. The international and national focus on sustainable integrative community development has contributed to the need for an interdisciplinary trained graduate that can facilitate sustainable integrative community development. The graduate best suited would be a human ecologist, as human ecology is the only discipline that is interdisciplinary. Human ecology focuses on integrated solutions for complex environmental and socio-economic needs which cannot be addressed by any single discipline.
The paper describes the process of curriculum renewal for sustainable integrative community development by the Department of Human Ecology at the University of the Western Cape (South Africa). The research methodology applied in this process is programme evaluation. The evaluation study described in this paper is participatory clarificatory evaluation and it was the first of four evaluation designs that would be applied to the curriculum renewal process. The participatory clarificatory evaluation was driven by two main objectives: 1) to assess the need and feasibility of the new curriculum and 2) to evaluate the planning and design of the new curriculum.
The first objective was addressed by means of an environmental context assessment which indicated the need for an interdisciplinary community development specialist. The assessment of the second objective resulted in the clarification of the programme theory for the new curriculum – inclusive of the aims, objectives, and outcomes for the new BA Human Ecology (General) programme of the Department.

Introduction

The first steps towards a process of the BA Human Ecology (General) curriculum renewal by the Department of Human Ecology, at the University of the Western Cape (UWC), started as early as 2003 after a departmental academic review by the Academic Planning Unit (APU) of the University. The process of curriculum renewal was divided into four phases: 1) an analysis of the environmental context that influenced academic and curriculum approaches and content; 2) the development of a Human Ecologist profile based on the aforementioned analysis; 3) identification of the required changes to the existing curriculum in order to accommodate the above two phases; and 4) designing of a concept model that accommodates the changes to the curriculum.

The paper focuses on the results of a participatory clarificatory evaluation conducted on the four-phased curriculum renewal process by the Department of Human Ecology at the UWC. Babbie and Mouton (2005:340-341) classify programme evaluation into four different types, namely: 1) *need* – assess the unmet need in relation to the type of programme considered to address it; 2) *process* – whether the programme is being implemented as designed; 3) *outcome* – following on from the process evaluation but with attention to the intended outcomes of the programme; and 4) *efficiency* – focus moves on from establishing outcome to include the cost of the programme in relation to its benefits for the target group. Evaluation of *need* always precedes any of the other three types of evaluation, so as to obtain clarity with regard to the programme to be evaluated. This type of evaluation is therefore also known as clarificatory evaluation.

Participatory clarificatory evaluation involves all parties concerned with the programme with the purpose and method of imparting skill and empowerment in evaluation methodology. It is driven by two main objectives: 1) to assess the need and feasibility of a programme; and 2) to evaluate planning and design of a programme, which involves a logical step-by-step approach for the clarification of the programme theory (Wholey, Hatry & Newcomer, 2004:68). Thus, the end result of a participatory clarificatory evaluation is a team effort logic model (programme theory), which clearly indicates the programme's required resources, activities, outputs and outcomes, against which questions for evaluation studies of the programme could be developed (Wholey, Hatry & Newcomer, 2004:9). The results presented in this paper will be structured around the above two main objectives and consolidated with a discussion of the Human Ecology Curriculum Logic Model (inclusive of the aims and objectives for the new curriculum) developed during the participatory clarificatory evaluation research study.

The UWC is concerned with excellence, effectiveness and efficiency as reflected in the University Mission Statement: "…pursuing excellence and relevance in teaching, learning and research". The curriculum renewal by the Department of Human Ecology keeps these concerns as the core principle of its curriculum renewal process. This provides a determined and all encompassing curriculum

evaluation research process which focuses on teaching and learning as well as on the research – to ensure curriculum quality, effectiveness and efficiency. This all encompassing evaluation research process would be conducted over a period of eight years, during which all four of the above-mentioned evaluation designs (classifications) will be applied. Participatory clarificatory evaluation took place during the first year and the results thereof informed the planning and design of the new curriculum. Implementation of the new curriculum was then piloted over a four-year period (2006-2009) for which an implementation/process evaluation would be conducted at the end of 2009 – the fifth year of the all encompassing evaluation research process. An outcome evaluation will be conducted at the end of 2012, followed by an evaluation of efficiency, in order to assess cost in relation to the extent to which the programme addressed the identified need/problem from its initial environmental context assessment during the clarificatory evaluation. This paper presents only the results from the first applied evaluation design, namely: clarificatory evaluation.

Environmental context assessment

The environmental context assessment addressed the first main objective of the participatory clarificatory evaluation on curriculum renewal by the Department of Human Ecology. The assessment was conducted by means of a literature research review, together with key informant interviews with stakeholders of the new curriculum; i.e. the BA Human Ecology (General) programme. The environmental context assessment results that influenced the curriculum renewal highlighted two overall influencing factors for curriculum renewal, namely: 1) socio-economic factors, and 2) political factors with regard to academic and curriculum approaches of education and training in South Africa. These two factors were also interconnected as the academic and curriculum approach changes were influenced by the political factors as well as the socio-economic changes in South Africa that transformed the Department of Education (DOE) and the Higher Education Qualification Framework (HEQF) in terms of : a) higher education social responsiveness and accountability, b) change in concepts of learning and teaching in higher education (knowledge, skills and attitudes), c) the shift towards a learner centred perspective, and d) changes in teaching and methods of instruction, relating to the change in design and presentation of curriculum content (HEQF, 2007). The socio-economic factors assisted with highlighting the strategic importance of the new curriculum.

The strategic importance of the new curriculum is grounded in the international sustainable community development focus and the South African Intergovernmental Relations and Service Delivery. The international sustainable development focus is based on the United Nations Brundtland Commission's definition that is the most often quoted and states that sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundland,1987). This definition is the basis on which the International Institution for Sustainable Development (IISD) bases their core business which is "environmental, economic and social well-being for today and tomorrow" (IISD, 2005). The South African Presidency's Intergovernmental Relations and Service Delivery (IRSD) aims to transform the South African state and government. The South African democratically elected government of 1994 was faced with transforming the wide disparities in levels of income and development due to centuries of racial segregation and apartheid. Transformation would involve the democratisation of state institutions, readdressing inequality and extending services to all levels of society. This required economic policies focusing on poverty alleviation and service delivery. A number of reform initiatives were required in order to implement these policies (IRSD Report, 1999).

Some of these initiatives were: a) fiscal reform emphasising equity among spheres of government and multi-year transparent budgeting; b) the Public Service Act (South Africa, 1997: Act 97 & 13) that ensures a single public service at both national and provincial levels, resulting in the successful integration of pre-existing homeland administrations; and c) the municipal elections of December 2000 that resulted in the establishment of 284 municipalities, thus positioning local government as the key site for service delivery and development. Local government thus plays a very important role in the intergovernmental relations in South Africa (South Africa, 2005: Act 13).

The object of intergovernmental relations is to establish a system in which all spheres of government plan together to provide a coherent approach to service delivery and community development. This should be achieved by means of Integrated Development Planning (IDP). The milestone of integrated planning is the participation in municipal IDP by national and provincial sector departments (public sector) and private sector to ensure: a) implementation of national policy and legislation; b) enabling integrated service delivery to the community between public and private sectors; and c) promotion of sustainable development.

The above political and socio-economic factors all indicate the need for a sustainable and integrative community development intervention strategy. It is the integrative community development intervention strategy that would act as the foundation and focus for the new BA Human Ecology (General) curriculum, as it would bring about community well-being through facilitating empowerment. Community development is of strategic importance due to its relevance to every government department through the programmes of the South African government such as: a) the Local Economic Development (LED) Programme; b) the Extended Public Works (EPWP) Programme; and c) the Integrated Sustainable Rural Development (ISRD) Programme. The wide interest in community development within intergovernmental- and multi-sector private stakeholders emphasises the need for an interdisciplinary trained graduate who can facilitate sustainable integrative community development. Feldman (2004:2) states that one of the most

important features of the human ecology discipline is its interdisciplinarity which is beneficial in finding integrated solutions for the complex environmental and socio-economic needs that cannot be addressed by any single discipline. This confirms that human ecology is the only discipline that would be able to equip adequately and empower the above-mentioned graduate. It is possible as human ecologists during their training are exposed to courses in psychology, management, micro-enterprises, community development, research methodology, and several other related areas. It is the exposure that enables the human ecologist to inculcate respect for intercultural, trans-disciplinary and sustainable approaches to sustainable and integrative empowerment and well-being of communities, families and individuals.

Evaluation of the curriculum renewal planning and design

The evaluation of the curriculum renewal planning and design was the second main objective of the participatory clarificatory evaluation. Three research questions were developed for the assessment of the objective, namely: 1) Is the programme theory (curriculum logic model) designed to address the need for an interdisciplinary trained graduate who will be able to facilitate sustainable integrative community development? 2) What components and activities (action model) are needed for the success of the new BA Human Ecology (General) programme? 3) Does the action model (what needs to be done) of the programme support the change model (what would be achieved) of the programme?

Programme planning and design takes place before the implementation of a programme, based on a given or identified need (Rossi, Freeman & Lipsey, 2004:134). The need for the human ecology curriculum renewal was identified during the environmental context assessment phase of the research study. Evaluation of programme planning and design involves a logical step-by-step approach to clarify the programme theory that was developed to address the identified need for the programme. Thus, the assessment of programme theory builds on the results of the needs assessment. Programme theory is presented in the form of logic models that indicate the action model as well as the change model of a programme.

Programme logic is based on cause-and-effect relationships to address identified needs. Logic models provide hypotheses of how the programme is supposed to work in order to achieve the intended outputs by linking it to the intended outcome (Wholey, Hatry & Newcomer, 2004:19-20). The development of a logic model during a clarificatory evaluation produces four main benefits for designing and conducting the process (second) evaluation after four years of piloting the new curriculum. These benefits are as follows: 1) evaluation issues are indicated with key performance measurement points in order to improve the data collection process; 2) programme design benefits through identification of goal attainment and/or implausible linkages to the programme goals; 3) programme place in an organisation and programme hierarchy can be identified; and 4) a common understanding of the programme and its expectations are indicated which leads to the sharing of ideas, team building and good communication (Wholey, Hatry & Newcomer, 2004:11). Comprehensive and valuable evaluations of programmes are only possible if the programme logic model "specifies the mechanisms by which change is achieved, not just the activities or characteristics that are associated with change …. as it matters to know whether a programme works by one rout rather than the other … so that staff can maximise the components that turn out to be operative in attaining the objectives" (Weiss, 1997:511).

The participatory clarificatory evaluation programme theory results

The participatory clarificatory evaluation research questions stated earlier in this paper were answered by means of data gathering and data analysis triangulation. The evaluator conducted a secondary data analysis of the project documents available. These documents consisted of workshop reports, strategic planning documents, minutes of monthly meetings, and monthly and annual reports. The analysis provides background information for the evaluator to conduct semi-structured interviews and observations at the Department of Human Ecology. The secondary data analysis, semi-structured interviews and observations were thus a triangulation of data gathering. The findings from this process indicated the strategic core decisions taken by the department for curriculum renewal and resulted in the compilation of a programme document, namely: Understanding the BA Human Ecology (General) Programme. This document was used by the evaluator to facilitate the participatory development of the programme theory which was presented in a logic model. The strategic core decisions as well as the UWC Strategic and Institutional Operating Plans underpinned the theory of programmatic action and change for the BA Human Ecology (General) Programme. The strategic core decisions of the Department could be summarised as follows: a) the curriculum should be comprehensive and relevant to the environmental context, in order to deliver a product that could serve national and international spheres as well as both in public and private sectors; b) the teaching and learning of students should be aimed at nurturing a positive and motivated attitude, so that students become lifelong learners; c) the programme must be linked to service learning, so as to provide the opportunity for students to put theory into practice; d) an integrated approach to the curriculum must be followed specifically with regard to the interdisciplinarity character of human ecology; and e) any lack or maximisation of resources must be addressed (adapted from Wasserman, 2004).

These strategic core decisions formed the basis on which the Department set itself seven aims to achieve with the students in the new curriculum. These seven aims determine the objectives,

Table 1

Aim 1: Curriculum Content Load

Aim 1: Curriculum Content Load	Objectives
To help the student deal with the content load of the curriculum	1. Present manageable content load to student
	2. Reduce amount of irrelevant knowledge conveyed to students at undergraduate level (focus should be on integrative project cycle management)
	3. Provide students with relevant outcomes of expected learning
	4. Provide students with clear outcomes of expected learning
	5. Clearly prioritise knowledge

Source: Adapted from (Wasserman, 2004)

Table 2

Aim 2: Learning Responsibility

Aim 2: Learning Responsibility	Objectives
To help the student take responsibility for his/her own learning	1. Encourage students to work independently through structured & well-guided self-study
	2. Encourage students to use various learning resources other than notes taken during lectures
	3. Make students aware of necessity to continuously update their knowledge

Source: Adapted from (Wasserman, 2004)

Table 3

Aim 3: Current Educational Approaches

Aim 3: Current Educational Approaches	Objectives
To educate the student in accordance with the current educational approaches	1. Employ various teaching strategies to encourage students to have an intense approach to learning
	2. Optimise access of students to teachers
	3. Develop problem-solving skills of students

Source: Adapted from (Wasserman, 2004)

activities, outputs and outcomes that are required for the programme. The process of formulating the logic model content during a clarificatory evaluation is most of the time only based on the amount of detail in the secondary data of the programme. However, the evaluator ensured validity critiques of the logic model by following the suggestion made by Rossi et.al (2004:153) through collaboration with relevant experts in social research as well with stakeholders of the programme, when formulating the logic model. It was applied to this study by means of obtaining, clarification and support during each step of the logic model development. It enabled the evaluator to make the claim at the end of the study that the objectives, activities, outputs and outcomes that were formulated sufficiently describe the programme. The following section briefly describes the results of the seven aims (to be seen as broad goals) with their objectives and outcomes for the BA Human Ecology (General) programme.

Tables 1-7 are adapted from Wasserman (2004).

The first aim of the programme is: to help the student deal with the content load of the curriculum. This aim is driven by five objectives which are indicated in Table 1.

The five objectives indicated in Table 1 would produce the following end results (outcomes): a) students are able to cope with the amount of content presented in the curriculum; b) content provides knowledge with a more holistic focus; c) students are well informed on the expected outcomes of their learning, and thus produce better assignments; d) students have clear knowledge on the expected outcomes of learning and are thus better prepared for formal assessments; and e) students can prioritise knowledge.

The second aim of the programme is: *to help the student take responsibility for his/her own learning*. This aim is driven by three objectives indicated below in Table 2.

The outcomes that would be achieved for the three objectives in Table 2 are: a) students are able to work independently; b) students learn with the aid

Table 4

Aim 4: Working Environment Preparation

Aim 4: Working Environment Preparation	**Objectives**
To prepare the student to function in the working arena after graduation	1. Present content that focuses on knowledge required for a generalist specialist
	2. Teach students about the disciplines, theories and relate it to transdisciplinary status
	3. Teach and train students in facilitation
	4. Teach students integrative project/programme cycle management
	5. Teach students integrative and sustainable development approaches
	6. Teach students policies and structures of international, regional and nation development institutions, inclusive of governments and their decentralised levels
	7. Teach students housing policies, their financial aspects and cultural context
	8. Teach students ecological approach to families and communities
	9. Teach students sustainable local economic development (LED)
	10. Incorporate development practitioners in presentation of curriculum to provide theory in practice perspective

Source: Adapted from (Wasserman, 2004)

Table 5

Aim 5: Learning Environment Diversity

Aim 5: Learning Environment Diversity	**Objectives**
To foster and sustain diversity in the learning environment	1. Develop criteria for admission to and selection for the degree in terms of increasing the number of students
	2. Support the learning of "disadvantaged" students. Make students aware of necessity to continuously update their knowledge

Source: Adapted from (Wasserman, 2004)

of various resources; c) students are well informed on the expected outcomes of their learning, and thus produce better assignments; and d) students are aware of the dynamic nature of development and ever-changing environment.

The third aim of the programme is: *to educate the student in accordance with the current educational approaches*. This aim is driven by three objectives which are indicated in Table 3.

The three objectives in Table 3 would produce the following outcomes: a) students build and enhance their knowledge by participating in various activities; b) students feel free to ask questions and find it easy to approach lecturers ("practice what we preach"); and c) students are able to solve problems.

The fourth aim of the programme is: *to prepare the student to function in the working arena after graduation.* This aim is driven by ten objectives and is the essence of knowledge, skills and attitude content of the curriculum. The ten objectives are indicated in Table 4.

The ten objectives indicated above would produce the following outcomes: a) students acquire knowledge and skills suitable to practice as a generalist community development specialist; b) students are capable of applying integrative and sustainable development management; c) students are familiar with the national, regional and international development network inclusive of policies, financial cultural and socio-political contexts; and d) students are provided with practitioner's perspective and integrative sustainable development.

The fifth aim of the programme is: *to foster and sustain diversity in the learning environment.* This aim is linked with two objectives that are indicated in Table 5.

The two objectives indicated in Table 5 would ensure achievement of the following outcomes: a) the race, gender and social profile of students are better aligned with that of the national population in South Africa; and b) previously disadvantaged students are successful in the programme.

Table 6

Aim 6: Socio-Political Responsiveness

Aim 6: Socio-Political Responsiveness	**Objectives**
To be responsive to the current socio-political environment	1. Train the student in emotional intelligence – thereby focussing on the student person as a whole
	2. Train the student to be skilled for both public and private development sectors
	3. Develop a concept of multiple realities (cultural, economic and socio-political differences)

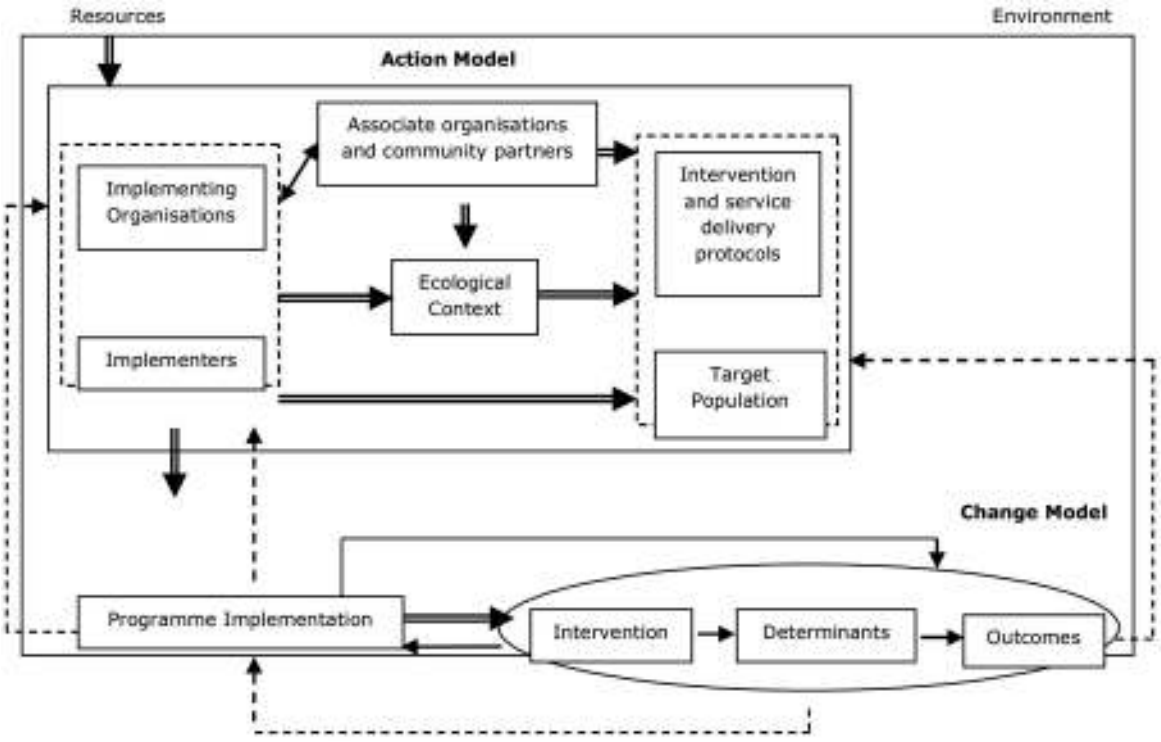
Source: Adapted from (Wasserman, 2004)

Table 7

Aim 7: Increased Effectiveness and Efficiency

Aim 7: Increased Effectiveness & Efficiency	**Objectives**
To increase effectiveness and efficiency of the curriculum in terms of cost and other resources	1. Use lecturers not employed by the UWC to help fulfil needs of new curriculum
	2. Development of short courses out of the overall curriculum for graduate professionals
	3. Diversify study/learning options and availability (i.e. E-learning and distance learning)
	4. Diversify research and research income stream

Source: Adapted from (Wasserman, 2004)



Source: Chen, 2005:31

Figure 1. **Conceptual framework of programme theory**

The sixth aim of the programme is: *to be responsive to the current socio-political environment.* This aim is also the key to the curriculum content of the programme and is supported by three objectives indicated in Table 6.

The three objectives for the sixth aim would produce the following outcomes: a) students become ambassadors for the UWC in leadership, transferring skills and exceptional communication; b) graduates are able to function in public and private sector entities; and c) graduates apply the concept of multiple realities in the community development environment.

The seventh and last aim of the programme is: *to increase effectiveness and efficiency of the curriculum in terms of cost and other resources.* This aim is linked with four objectives that are presented in Table 7.

The four objectives presented in Table 7 would produce the following outcomes: a) lecturers with adequate knowledge and skills to present the curriculum, without incurring additional costs of making appointments; b) improved and positive reputation of the Department and the UWC as a whole; c) improved capacity of service provider/ employer for poverty alleviation; and d) improved reputation of the Department – within the UWC as a significant research development university.

The above seven tables addressed the first research question that assessed whether the programme theory (curriculum logic model) had been designed to address the identified need, for an interdisciplinary trained graduate, during the environmental context assessment. The results presented in the seven tables indicated that the curriculum logic model was designed to address the identified need. The evaluator then recommended that clear activities and indicators be developed for the programme logic model before implementation in order to ensure proper monitoring of the implementation process. This monitoring process would also assist with the next evaluation, namely: process evaluation, after the four-year pilot implementation of the curriculum. The next section will deal with the remaining two research questions which assessed whether the action model of the programme supports the change model of the programme.

The conceptual framework of programme theory by Chen (2005) was used as framework to describe the action and change model of the BA Human Ecology (General) programme. The conceptual framework of Chen (2005) is indicated in Figure 1.

Chen's framework assisted the evaluator with identifying and describing the resource and support requirements (inputs) that were required for the programme action model leading to the change model which related to the objectives of the programme. The outcomes of the project are due to a joint effect of the implementation and the factors in the action model, indicated in the above figure. The resource requirements for the programme were: 1) human resources (UWC management, lecturers and administrative staff); 2) financiers at the UWC for the programme; 3) course materials; 4) assessment policy and forms; 5) administrative systems, course evaluation questionnaires and interview schedules; and 6) marketing material. The action model of a programme can be implemented once these resources are mobilised (Chen, 2005:30-31).

The action model that was developed for the BA Human Ecology (General) programme indicated that the Department of Human Ecology was the implementing entity and the human resources listed above were the implementers of the programme. This represents the first dotted line box within Chen's (2005:31) action model. The Department together with the implementers of the programme collaborated with other stakeholders to develop and present the new curriculum. The collaboration also assists with service delivery to the students and the public and private sector entities that needs these graduates. It is indicated in the second dotted line box of Chen's (2005:31) action model. In order for the programme to be effective, the evaluator had to ensure that its action model is sound and its change model plausible. In other words the programme activities need to be coordinated, reach the target group and provide adequate exposure to the group (Chen, 2005:30). The implementation of the action model (inclusive of all its factors) is a factor leading to the activation of the (programme theory) change model (Chen, 2005:30-32). It was indicated earlier in Tables 1-7 and the evaluator could thus conclude that the BA Human Ecology (General) programme action model did support the programme's change model. It is also evident in the fact that the new curriculum highlights a shift to an outcome-based approach that is linked with the knowledge, skills and attitudes the students develop in their discipline in order to be fully prepared for their future employment.

Conclusions

The study discussed in this paper applied the methodology of participatory clarificatory evaluation in order to design a theory-based programme for future process and outcome evaluation studies of the BA Human Ecology (General) programme. Theory-based programmes enable evaluators to understand the circumstances in which a set of evaluation approaches and methods become appropriate for evaluating a particular programme (Chen, 2005: 11-12). The purpose of this evaluation study was *clarification*. The operationalisation of the study was conducted in two stages. Stage 1 dealt with the assessment of need and feasibility of the programme relating to the environmental context analysis within which it was conducted. Stage 2 dealt with the planning and design of the programme and focused on the programme theory inclusive of its action and change models.

The assessment of planning and design consisted of three steps. The first step was the assessment of programme theory, done by means of secondary data analysis of programme documents, semi-structured interviews, and observations. The next two steps involved assessment of the action and change models for the programme, done by means of a number of workshops and focus

group interviews which were then related to the findings of the secondary data analysis of Stage 1. It is presented above in Tables 1-7 and Figure 1 and it enabled the evaluator to conclude that the programme is: a) planned and designed to address the identified need; and b) its action model does support its change model.

Proposals for participatory evaluation

Participatory evaluation relates to various other approaches known as participatory research, action research, and participatory action research. These approaches differ considerably with regard to their emphasis on action in relation to the research, the role of the researcher in the action, and their political orientation. However, notwithstanding these considerable differences, they "constitute a group of approaches committed to the development of a change-enhancing, interactive, contextualised approach to knowledge building" (Brown, 1995:216). Nash (cited by Brown, 1995:217) explains participatory research as "a three-part process of investigation, education, and action… and requires the active participation of members in problem posing and solving…as an educational process". Participatory research seeks to lessen the distinction between the researcher and the unit of analysis which, as a result, highlights all the cautions with regard to ensuring reliability and validity of such studies. The reliability and validity of participatory studies could be ensured by: 1) stressing up front the value and need for rigour to all parties that would be involved in the evaluation study, and 2) simplifying concepts in such a way that understanding takes place without hampering the uniqueness and essence of what all participants bring to the study (Crishna, 2006:225). Participatory evaluation is based on qualitative research principles, which means that the principle methods used for collecting data are very similar as both approaches make use of case studies, in-depth interviews, focus group discussions, participant observations, and diaries (Crishna, 2006:225). It was evident in the Human Ecology curriculum renewal evaluation study. Reliability was further ensured with the application of triangulation for data gathering and analysis. Validity in a participatory evaluation could be ensured by considering some of the following main aspects of validity: 1) content validity and 2) construct validity (Crishna, 2006:225). The purpose of content validity is to ensure that the full story unfolds – it was ensured in the Human Ecology curriculum renewal study by compiling a programme document to which all the stakeholders contributed. Construct validity was ensured in the study in that triangulation was applied by using multiple data sources and data collection methods. Participatory evaluation studies have a number of challenges such as 1) these evaluations are able to follow a logical sequence but it is difficult to define and maintain a set structure in advance; 2) participatory evaluations require time, as you need to allow time for learning, sharing, transfer of skills and understanding perspectives; 3) the role and ability of the facilitator to have and maintain an attitude of learning and sharing relates directly to the process of empowerment; 4) the balance between the flexibility and adaptability of the evaluation versus the available time and cost; 5) confusion which is often caused by the varying perceptions of stakeholders; and 6) it is a complex process requiring a great deal of imagination and skills on the part of the facilitator (evaluation expert) to manage the technical aspects of research, such as ensuring reliability and validity and minimising bias, in a way that could be understood by all parties involved in the evaluation without loosing the basic essence.

In spite of these challenges it is nevertheless proposed that these type of evaluation studies are used more frequently as they are socially and emotionally very rewarding (social capital), provided that the evaluation expert is sufficiently skilled and experienced in the facilitation skills and evaluation methodology. The reward in participatory evaluation studies is not financial capital, but lies within the learning and empowering results for everybody, including the researcher who participates in the evaluation study.

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Development Scenarios of Higher Education System in Latvia

Dace Vīksne, Mag.paed., PhD student
Department of Economics, Faculty of Economics, Latvia University of Agriculture

Abstract. The situation in the sphere of higher education has aggravated in 2009 due to the economic crisis, resulting in the initiation of precurses for higher education reform. Several possible development variants were elaborated, and later discussed and analysed within the period of one year. The establishment of one large research university and liquidation of regional higher education institutions was one of the most complicated issues. The research provides a detailed description of the author's proposed development scenarios of higher education system as well as the assessment of these scenarios. The research aim is to determine the most optimum development scenario of higher education system based on the experts' valuation. Publications of Latvian and foreign researchers and report of different ministries as well as statistics were used to achieve the set aim and advanced research tasks. The research is based on generally accepted economic research methods: monographic-descriptive method, method of analysis and synthesis as well as the Analytic Hierarchy Process or AHP method was used to interpret the models and facts. The Analytic Hierarchy Process method indicates that the highest average evaluation was received by the scenario "Regional universities are centres around which regional higher education institutions collaborate and internationalisation takes place". It means that Latvia should develop regional higher education institutions so that they could work in the interests of regional development.
Key words: higher education, regional HEIs, development, reforms, scenarios.

Introduction

Education throughout the centuries and different social systems has always been and will be the most significant, essential, persistent, and outstanding development factor and value in the society's opinion which generates result or profit indirectly, since it emerges within a definite period of time in new ideas, new objectives, new attitudes, and competencies of every next generation. Higher education is a driving force of individual, social and economic mobility of people granting belief to an individual on his/her skills and abilities to increase the inborn social status. Knowledge and education allow application of new possibilities and technologies in the analysis of social and economic difficulties. People are more ready to invest in the increase of education level and acquisition of academic and scientific degrees with the growth of the welfare level. In Latvia there are quite broad studies on the aspects of higher education; although there are few studies on the development scenarios of higher education institutions. Mainly the research has been done on individual higher education institutions (A.Tīfentāls, G.Zvigulis, 2003; S.Vanaga, A. Šņitņikovs, 2002; Rivža B., 2000, 2004, 2007, 2008) as well as there is research by G.Mazūre, D. Vīksne et al. (2007, 2008) on regional higher education institutions of Latvia in general.

The development of world universities in the regions has been researched more comprehensively, since several scientists, like Ahola S. (2005); Arbo P., Benneworth P. (2007); Brunner J.J. (2003); Goddard J.B (2003); Kilper H. (2004) and others have researched these aspects. Several scientists of Latvia have done research on academic and scientific potential, like academicians B. Rivža, P. Cimdiņš (2002 u.c.), Dzelme J. (2009 etc.), Auziņš A. (2009 etc.), scientists J. Bruners, R. Kasa, V. Meņšikovs (2006) and others. The contribution of A. Rauhvargers to the development of higher education in Latvia is significant.

In 2009 the situation in the sphere of higher education aggravated due to the economic crisis, resulting in the initiation of precurses for higher education reform. Several possible development variants were elaborated and later discussed and analysed within the period of one year. The establishment of one large research university and liquidation of regional higher education institutions was one of the most complicated issues. However, it is essential to emphasise that regional higher education institutions in Latvia fulfil more expanded functions, unless teaching of students and researching. They create the intellectual environment of a particular region, ensure local organisations and entrepreneurs with the expertise and consultations as well as maintain positive inner competition among higher education institutions of Latvia. This factor as well as structural reforms initiated in the sphere of higher education served as the basis for the research **hypothesis**: the development of regional higher education institutions is one of the most optimum variants for the development of higher education. The research **aim** is to determine the most optimal scenario for the development of higher education based on the experts' valuation. The following research **tasks** are advanced to achieve the set aim:

1) to provide a general survey on higher education;
2) to elaborate scenarios for the development of higher education;
3) to study and assess the elaborated scenarios, and to determine the most optimal development model.

To achieve the set aim and tasks of the research the author has used publications and studies of Latvian and foreign scientists, surveys and reports of the Ministry of Education and Science and the Ministry of Economics, statistical data as well as theoretical and analytical literature. The research author widely applies generally accepted research methods in economics, i.e. monographic descriptive method as well as analysis and synthesis methods to study the problem elements. The Hierarchy Analytical Process or AHP method is applied to interpret models and facts.

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Results and discussion

1. General survey on higher education

Higher education with its classical development model of the 20th century lags behind the rapid technological changes of the knowledge society. It is even more difficult to fulfil the requirement for higher education institutions to prepare specialists ready for work in a certain field right after the graduation; even longer on-the-job trainings may not help. Therefore there is a need to transfer to another development model. Higher education (also vocational education and consequently other components of the education system) shall change the structure, objectives, and principles. Higher education institutions shall ensure theoretical studies, skills to study as well as skills and wish (orientation) to solve new tasks on the conditions of incomplete information. Every company, institution, or organisation already now and also in the future shall consider the necessity to teach employees additionally for new tasks, responsibilities, new technologies, and to envisage a possibility to improve knowledge and skills continuously.

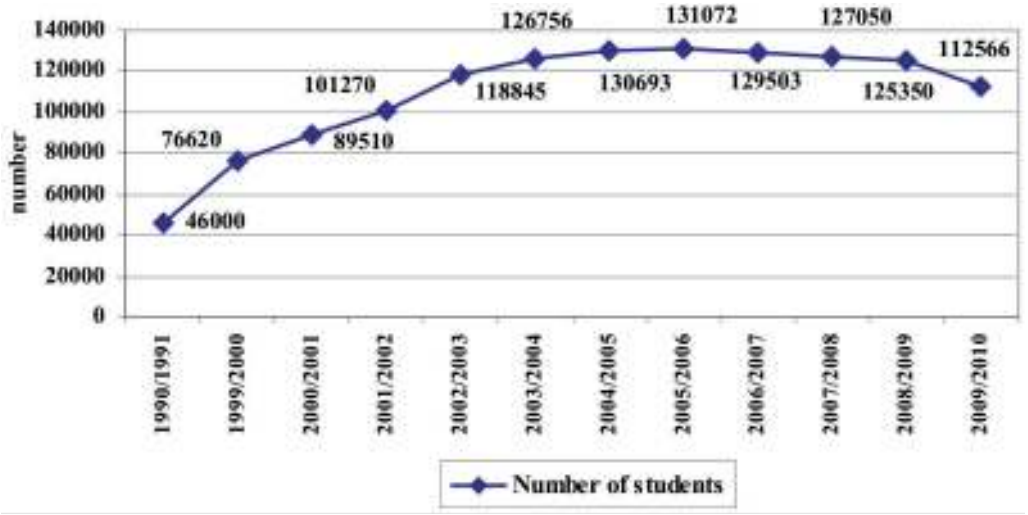
The new situation, new paradigm greatly differs from the previous requirement – to prepare specialists once for the whole life to work in one speciality. The Bologna process and its continuation for the establishment of the single European Higher Education Area emphasises employment and establishment of united lifelong learning system, basically it means that:

- higher education institutions shall reject narrow specialisation of study programmes. The development of a narrow field study programme to prepare for every occupation already in higher education institutions leads to nowhere. The professional qualification acquired in a higher education institution shall not comply with any professions or positions of the Profession Classifier. HE institution shall provide knowledge and possibilities for the use of knowledge, including practical examples;
- higher education institution shall be the place where new technologies emerge and together with their carriers are transferred to the sectors of the national economy (it is the essence of innovative development). Any specialist shall be able to know the research world, to understand not only fundamental research results and participate in practical studies, yet s/he shall be able to find and apply new prosperous trends of fundamental research. Mathematics is the universal language of science, and the application and understanding of mathematical principles is the necessity for every specialist with higher education, even in humanities;
- the necessity for a creative approach and motivation, autonomy and responsibility requires every new specialist with higher education to get familiar with the achievements in arts, sciences, and philosophy. It is recommended to reject division of study programmes into academic and professional ones as it is already envisaged by the draft Law on Higher Education;
- new study programmes encompassing many specialisations shall be established; thus providing opportunities to students to draft plans for individual studies through elective courses, distance learning, and individual approach. Elimination of the study programmes fragmentation, merging of study programmes in large units (blocks) formally will lead to the redundancy of study programmes; however, each higher education institution may develop its characteristic features:
    1) every higher education institution shall create its own research base, original research trend;
    2) every higher education institution shall develop its own contacts with labour market, producers (firstly, local), colleagues in other higher education and research institutions (Dzelme J., 2009).

The readiness of graduates for the European labour market is close, these activities shall be developed further, though at the same time we have to think about population which remains in Latvia and develops attractive land and market here. Otherwise why should we have higher education institutions, if the nation decays? Restructuring possibilities for the development of intellectual capital are easier in the regions compared with the political atmosphere governing in the capital Riga. Besides the trends, standards, and requirements are clearly set and understandable to HE institutions in the common European Higher Education Area. The only thing is to ensure capacity to carry on the activities for the development of intellectual capital (Cimdiņš P., 2002). It is interesting that the words said in 2000 have acquired a special significance and topicality also in the period of 2009-2010.

In Latvia the number of students is decreasing (Figure 1) for the fourth year running, i.e. the total number of students in all HE institutions of Latvia equalled to 125 350 students in the study year of 2008/2009, thus being 4.4% less than in the study year 2004/2005.

The statistics provided by HE institutions on the enrolment results on September 5, 2009 show that the number of potential students in 2009 has decreased by 26% on average compared with the previous study



Source: made by the author according to the data of the Ministry of Education and Science, 2009

Figure 1. **The dynamics on the number of students in HE institutions of Latvia for the period of 1990-2009**

year. Mainly the decline in the purchasing power of population explains the decrease in the number of students (considering unfavourable demographic situation, the number of students should decline only by 2-3%). The number of potential students is forecasted to decline by 50% less between 2015 and 2017 compared with the present situation (EM ziņojums, 2009).

Presently there are 18 state founded HE institutions, including 6 universities, 5 academies and 7 higher education institutions, and 11 state founded research institutions in Latvia. All these institutions have a secondary public status. In 2009 the Ministry of Economics elaborated a result-oriented management model which envisages that the government does not prescribe the changes in the institutional system, though it:

1) supports reforms in the institutional system, in case the merging of HE institutions is voluntary;
2) raises increased quality requirements and ensures result-oriented approach in funding and grounds preconditions for consolidation (EM ziņojums, 2009).

It means that the Ministry of Education and Science evaluates the implementation efficiency of equal or similar study programmes, and research directions in different HE institutions, and enhances joint inter-institutional activities (for example merging of study programmes, joint research projects etc.), thus consolidating the existing resources on the level of study programmes.

According to the statistics rapid changes have occurred in higher education sector during the past 20 years. In Latvia the number of higher education institutions has grown 2.5 times, besides the number of private HE institutions has increased enormously. The demand for higher education certainly explains the relatively high number of HE institutions in Latvia. The number of students per 1000 inhabitants has been the highest one in the world. The comparison of number of public HE institutions and the number of population in different countries (considering the number of students) leads to the conclusion that there are 8 public HE institutions per 1 million inhabitants in Latvia, which is less than in similar European countries, like Lithuania (9), Estonia (11), Finland (10), Bulgaria (9), but more than in Germany (6), Denmark (5), Slovenia (2), the Netherlands (2), and other countries (EM Ziņojums, 2009).

The fact that currently higher education is available to the population of all the regions of Latvia is positive. However, the density of HE institutions in the territory of Latvia is still unequal, i.e. between 44 and 60 higher education institutions (73% of total number) is located in Riga, yet at the same time the placement of HEI branches in the territory of Latvia is quite equal.

2. Development scenarios of higher education

The Ministry of Economics and the Ministry of Education and Science of the Republic of Latvia offer 5 scenarios or models for higher education development in the "Informative Report on the Required Structural Changes in Higher Education and Science to Achieve International Competitiveness of the National Economy of Latvia". The research author offers four base scenarios and the comparison of these scenarios for the reform of higher education to determine the most optimal development version.

Scenario 1: "Current model – 6 universities"

The public sector of higher education system of Latvia consists of six universities – University of Latvia (LU), Riga Technical University (RTU), Riga Stradiņš University (RSU), Latvia University of Agriculture (LLU), Daugavpils University (DU), and Liepāja University (LiepU) as well as three higher

education institutions of art, and state research institutions with a secondary public status. The main goal of this scenario is to ensure the availability of higher education to the population of Latvia.

Scenario 2: "One many-settlement University"

According to the international competitiveness requirement and the available resources, a new research university is established on the basis of the present state founded higher education institutions and research institutes, and it implements study programmes and does research both in Riga and the regions. In this case the efficiency of including three higher education institutions of arts – Latvia Academy of Culture (LKA), Latvia Academy of Arts (LMA), and Jāzeps Vītols Latvia Academy of Music (JVLMA) – in the mentioned university would be evaluated separately. In this case the university in Riga may qualify for the status of a research university. It should be noted that the quality of education in Riga and the regions may be very different, thus causing essential problems in attracting students to the regional universities.

Scenario 3: "Specialised universities (inter-institutional cooperation)"

The number of state founded HE institutions and their typology remain the same if compared with the present situation – 18 universities, academies, and higher education institutions. The laws and regulations prescribe that study programmes and research projects of one sector are implemented as inter-institutional joint activities (e.g. study programmes in medicine are implemented between RSU and LU, in construction between RTU and LLU, in chemistry – between RTU and LU etc.), thus consolidating the existing resources on the study programme level.

It should be noted that the autonomy of each institution will be significantly limited in this variant as well as it is necessary to consider the impact of management traditions and culture of different higher education institutions on the performance results. The model of the institutional system of higher education and research is changed to consolidate higher education and research institutions, and to transform them according to the industry group principle, at the same time maintaining regional and arts higher education institutions as separate institutions. Thus industry group universities could be developed (e.g. university of natural sciences and engineering, university of social sciences and humanities etc.). The universities would then be responsible for the contribution of their industry group to attaining the goals and objectives of the structural changes.

Scenario 4: "Regional universities are the centres around which regional higher education institutions collaborate and internationalisation takes place"

The operation of six regional higher education institutions is envisaged in this variant – Latvia University of Agriculture (in Zemgale region), Daugavpils University and Rēzekne Higher Education Institution (in Latgale region), Liepāja University and Ventspils University College (in Kurzeme region), and Vidzeme University College (in Vidzeme region). Nowadays regional higher education institutions are not only the place where to receive higher education. A regional higher education institution shall act as the research centre of its region, and it shall promote the development of its region in all aspects, like it happens in the whole world – a university is the centre of regional development. Regional higher education institutions serve as catalysts for bringing positive changes into the future education system. They are more adaptable to innovations in the programme content and teaching methods as well as efficient use of resources.

The evaluation of provided scenarios was based on several goals, simultaneously prioritising the goals. The choice of the development scenario for higher education development was chosen as the highest goal (**first level**).

The **second level** offers four groups of criteria which were developed based on the objectives set by the "Informative Report on the Necessary Structural Changes in Higher Education and Research" developed by the Ministry of Economics of the Republic of Latvia. The offered objectives of the structural reform are grouped according to the set key goal of the structural reforms: higher education and research sector of Latvia ensures the base of knowledge and human resources necessary for knowledge economy as well as fulfils the following targets:

1. Higher education institutions ensure graduates corresponding to the needs of knowledge economy – responsible, internationally competitive, creative, and entrepreneurial.
2. Higher education institutions are active, successfully providing the lifelong learning offer which is necessary for knowledge economy to the population of Latvia of all ages.
3. Higher education and research institutions ensure international level research activity results that are successfully commercialised in Latvia, thus encouraging creation of innovative products (products and services) with high value added (Informative Report of the Ministry of Economics, 2009).

The objectives of the structural reforms offered by the Ministry of Economics of the Republic of Latvia are divided into four groups which are chosen as the second level criteria groups:

- efficiency and return on the use of resources;
- quality of the studies and research activities;
- internationalisation and global competitiveness;
- integration with the economy, social development, and innovative activity.

The criteria of the **third level** were also determined based on the objectives and resulting indicators prescribed by the "Informative Report on the Necessary Structural Reforms in Higher Education and Science" of the Ministry of Economics of the Republic of Latvia:

1. *Efficiency and return on the use of resources:*
   1.1. effective use of the resources of higher education institution;

1.2. technical provision of the study process;
1.3. increase of public financing for higher education through municipality financing;
1.4. maximum load on the infrastructure;
1.5. transparency of the public financing;
1.6. result oriented principle of allocating financing.

2. *Quality of the study and research activity:*
2.1. establishment of centres of excellence (which concentrate the study and research activities in a particular region);
2.2. development of internationally recognised publications;
2.3. provision of e-studies;
2.4. development of patents;
2.5. inter-institutional cooperation;
2.6. effective use of research infrastructure for tertiary level studies.

3. *Internationalisation and global competitiveness:*
3.1. increasing the role of international expertise;
3.2. larger attraction of foreign academic staff to work in HE institutions;
3.3. international competitiveness of the education institution;
3.4. support for the international growth of the academic staff of Latvia;
3.5. provision of internationally competitive knowledge and skills.

4. *Integration with the economy, social development and innovative activity:*
4.1. producers' ordered research;
4.2. development of industry clusters;
4.3. creation of innovative products;
4.4. provision of the necessary specialists in the region;
4.5. polycentric development of the country;
4.6. provision of lifelong learning in the region.

The following higher education development scenarios were analysed on the **Fourth level** (the lowest):

Scenario 1 – Current model – 6 universities;

Scenario 2 – One many-settlement university;

Scenario 3 – Specialised universities (inter-institutional cooperation);

Scenario 4 – Regional universities are the centres around which regional higher education institutions collaborate and internationalisation takes place.

The development and evaluation of the scenarios was based on a differentiated approach – the research author developed the scenarios, while 7 experts from the regions of Latvia representing higher education sector assessed the scenarios. The experts included an associate professor and the vice-rector for research of Daugavpils University; a professor and the vice-rector for research of Latvia University of Agriculture; a professor from the University of Latvia; an associate professor and director of graduate studies at Vidzeme University College; an assistant professor and director of Liepāja Research Centre, Riga Technical University; a project manager of Zemgale Development Agency; and a master student.

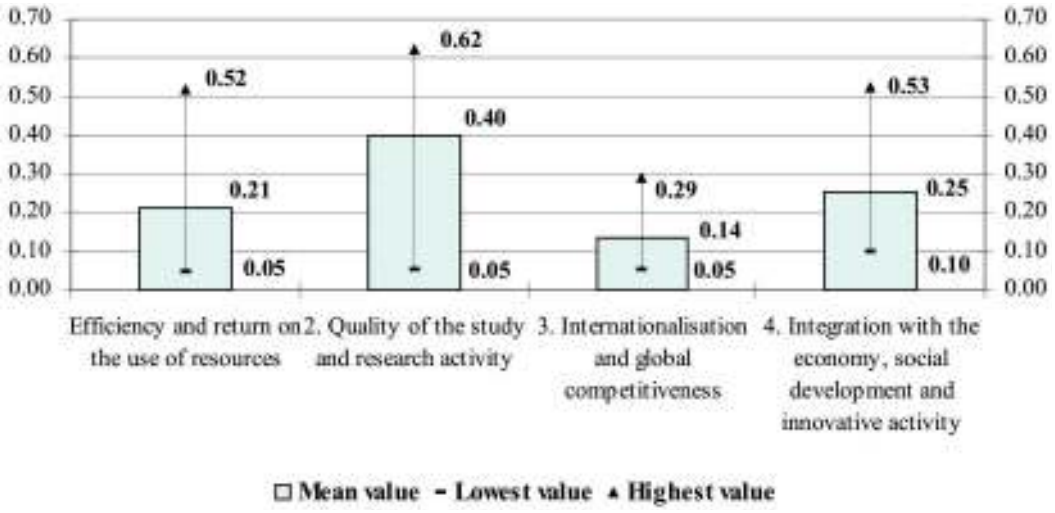
3. Evaluation of scenarios by means of the AHP method

The analysis of higher education system development scenarios is based on the Analytic Hierarchy process or the AHP method. The **Analytic Hierarchy Process (AHP)** is a structured technique for dealing with complex decisions. Rather than prescribing a "correct" decision, the AHP helps the decision makers find the one that best suits their needs and understanding of the problem.

Based on mathematics and psychology, it was developed by Thomas L. Saaty in the 1970s and has been extensively studied and refined since then. The AHP provides a comprehensive and rational framework for structuring a decision problem, for representing and quantifying its elements, relating those elements to overall goals, and evaluating alternative solutions. It is used around the world in a wide variety of decision situations, in fields such as government, business, industry, healthcare, and education. The problem is divided step by step in simpler components (decomposition). Then experts compare these components in pairs and evaluate the intensity of interaction of these components in the hierarchy (synthesis). These conclusions are transformed into figures by means of a relative weight scale. The sum of all the criteria beneath a given parent criterion in each tier of the model shall be below 10% or 0.10. Individual cases allow the relative weight of 20% (Saaty T., 1980). Finally, after the criteria are weighted and the information is collected, it is necessary to put the information into the model. Scoring is done on a relative basis, not an absolute basis, comparing one choice to another. Relative scores for each choice are computed within each leaf of the hierarchy. Scores are then synthesised through the model, yielding a composite score for each choice at every tier as well as an overall score. Mathematical processing of data is done by means of MS Excel.

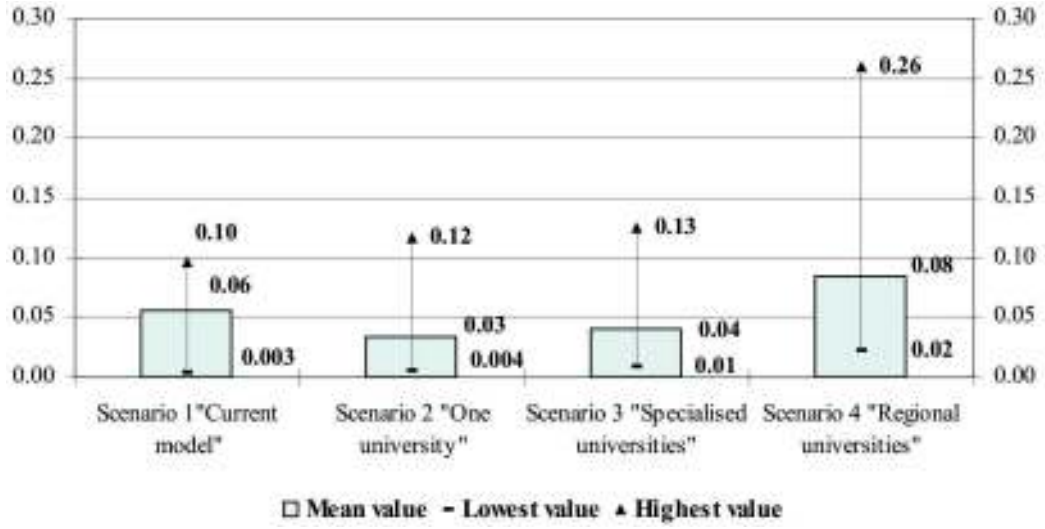
Summarising the experts' assessment on the evaluation of criteria groups for the development of the higher education system, the highest average evaluation is for the criteria group "Quality of study and research activity" – 0.40 (Figure 2), followed by the group "Integration with economy, social development and innovative activity" which has received the evaluation of 0.25; similar evaluation is granted to the criteria group "Efficiency and return on the use of resources" – 0.21, and the criteria group "Internationalisation and global competitiveness" with the evaluation of 0.14 points concluded the ranging.

When assessing the defined scenarios by the groups of criteria, Scenario 4 "Regional universities are centres around which regional higher education institutions collaborate and internationalisation takes place" received the highest mean assessment in the criteria group "Efficiency and return on the use of resources" – 0.08, followed by Scenario 1 "Current model – 6 universities" with the average assessment of 0.06. Scenario 2 "One many-settlement university" and Scenario 3 "Specialised universities (inter-institutional cooperation) have



Source: author's calculations and construction

Figure 2. **Experts' assessment on higher education system development by the groups of criteria**



Source: author's calculations and construction

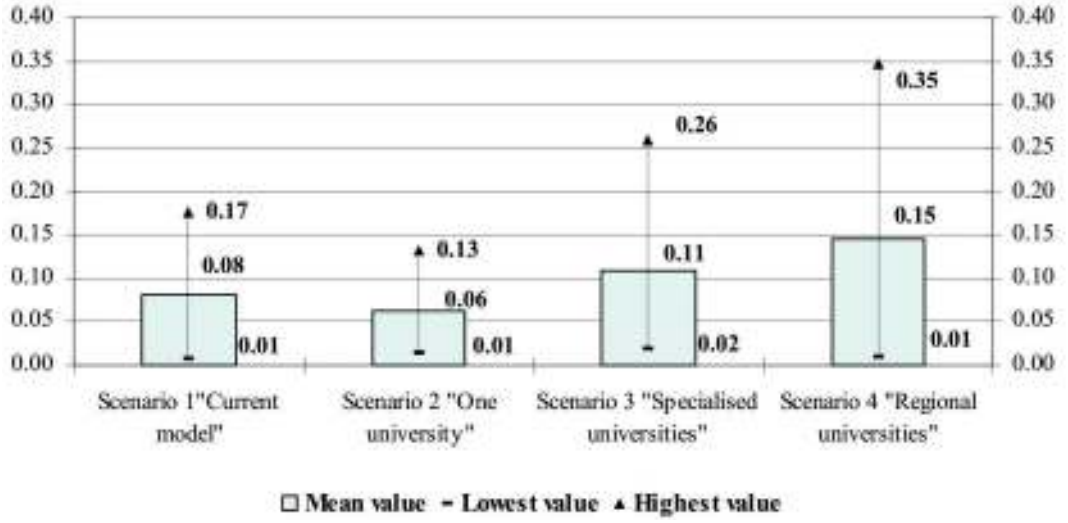
Figure 3. **Experts' assessment on the development of higher education system in the criteria group "Efficiency and return on the use of resources"**

received a similar evaluation – 0.03 and 0.04 respectively.

Also when assessing the defined scenarios by the groups of criteria, the highest average assessment (0.15) was received by Scenario 4 "Regional universities are centres around which regional higher education institutions collaborate and internationalisation takes place" in the criteria group "Quality of study and research activity", which gained the highest evaluation among the groups of criteria, thus it is considered the most significant. Scenario 3 "Specialised universities (inter-institutional cooperation)" took the second place with 0.11 points, while Scenario 1 and Scenario 2 were evaluated with 0.08 and 0.06 respectively.

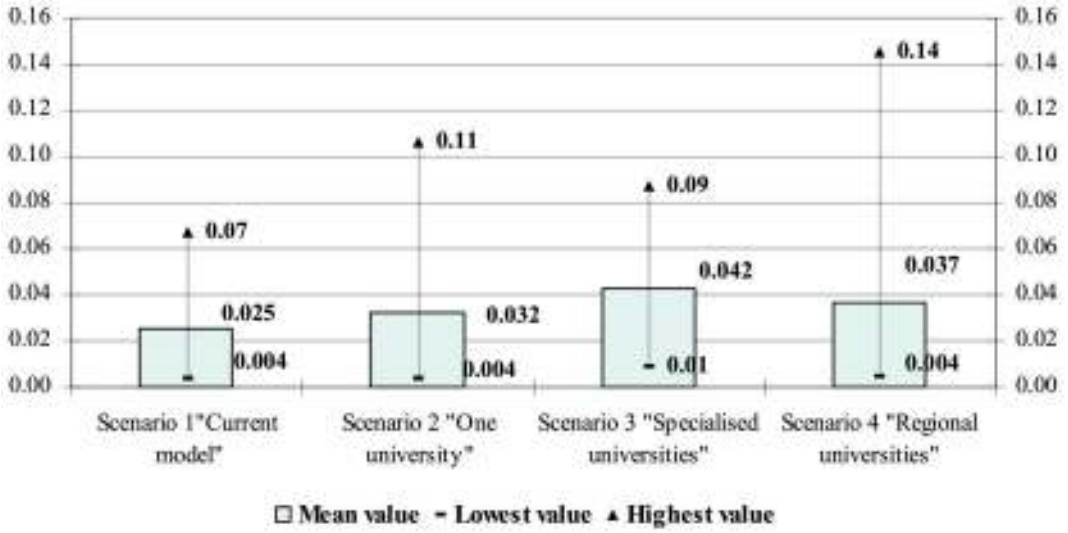
The third group of criteria "Internationalisation and global competitiveness" received the lowest evaluation in the assessment of criteria groups (Figure 2), also the mean values of the scenario assessment in this group are relatively the lowest ones (Figure 4). Scenario 3 "Specialised universities (inter-institutional cooperation) is evaluated as the highest – 0.042; the other three scenarios have a very similar evaluation. Scenario 4 "Regional universities are centres around which regional higher education institutions collaborate and internationalisation takes place" is evaluated with 0.037, Scenario 2 "One many-settlement university" – 0.032, and Scenario 1 "Current model – 6 universities" – 0.025 points.

When assessing scenarios in the final criteria group "Integration with the economy, social development and innovative activity", all scenarios were evaluated almost equally (Figure 6); however



Source: author's calculations and construction

Figure 4. **Experts' assessment on the development of higher education system in the criteria group "Quality of study and research activity"**



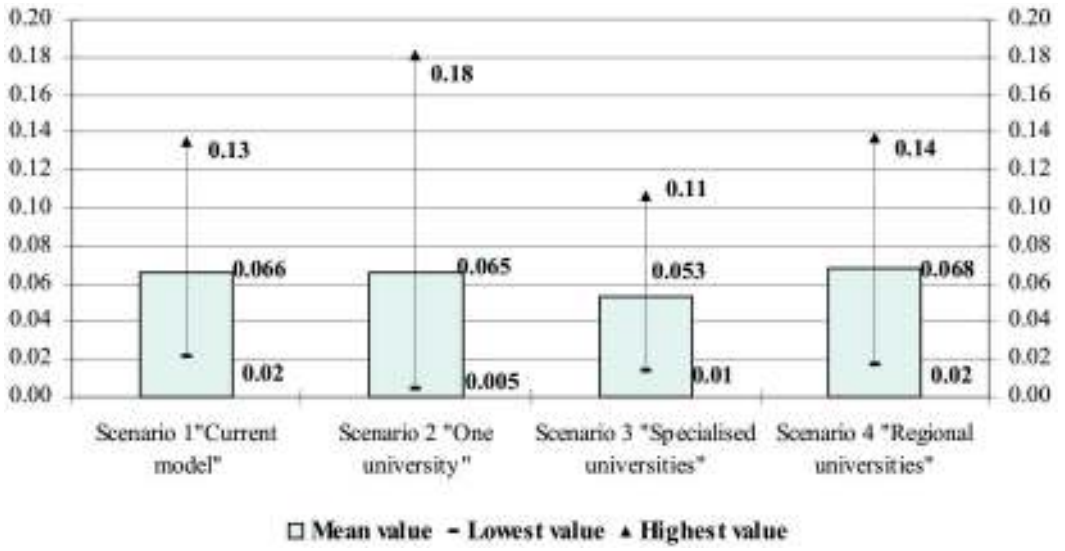
Source: author's calculations and construction

Figure 5. **Experts' assessment on the development of higher education system in the criteria group "Internationalisation and global competitiveness"**

Scenario 4 "Regional universities are centres around which regional higher education institutions collaborate and internationalisation takes place" gained a slightly better result – 0.068. Scenario 1 and Scenario 2 were evaluated with 0.066 and 0.065 respectively, while Scenario 3 received the lowest evaluation – 0.053.

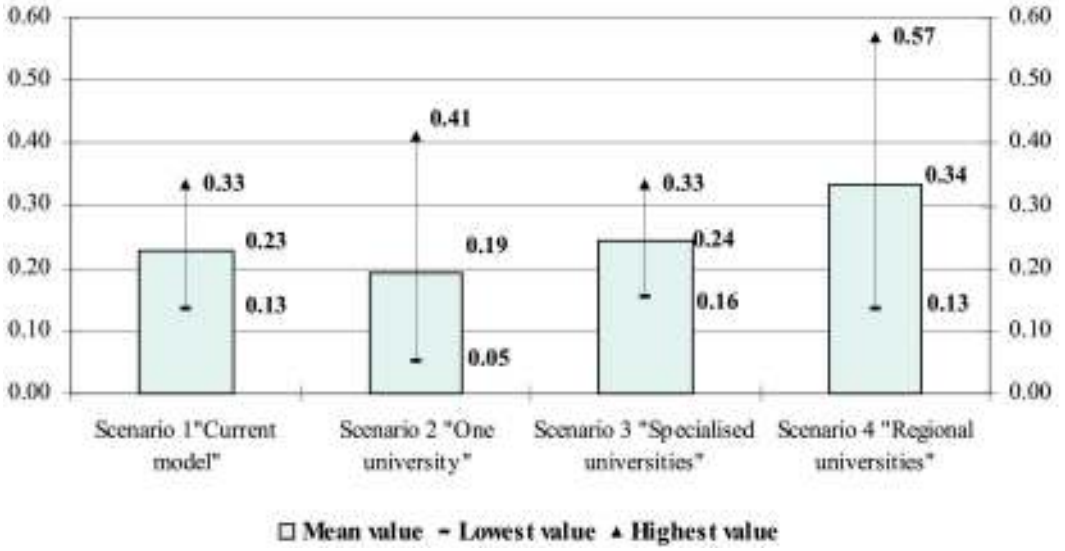
The summarising assessment (Figure 7) by all the groups of criteria, Scenario 4 "Regional universities are centres around which regional higher education institutions collaborate and internationalisation takes place" has received the highest average evaluation – 0.34, thus according to the experts' assessment, it should be considered as the most recommended scenario for the development of the higher education system of Latvia. However, a rather large dispersion of the experts' assessment may be observed, namely, the lowest evaluation for the Scenario is 0.13, while the largest – 0.57, which indicates to experts' disagreement. The next recommended scenario is Scenario 3 "Specialised universities (inter-institutional cooperation)" – 0.24, while Scenario 1 "Current model – 6 universities" and Scenario 2 "One many-settlement university" have received lower evaluations – 0.23 and 0.19 respectively.

According to the experts' of regional higher education institutions assessment, it can be concluded that Latvia should develop regional higher education institutions providing the respective financing and



Source: author's calculations and construction

Figure 6. **Experts' assessment on the development of higher education system in the criteria group "Integration with the economy, social development and innovative activity"**



Source: author's calculations and construction

Figure 7. **Total experts' assessment on the development of higher education system**

autonomy of operation so that these higher education institutions could work in the interests of the region. This variant emphases the goal of higher education system to provide the availability of higher education to the population of Latvia.

Conclusions

1. The issue on the efficiency of higher education and the necessary structural reforms has especially intensified due to the economic crisis.
2. Regional higher education institutions develop intellectual environment of a particular region providing expertise and consultations to local organisations and entrepreneurs as well as maintain positive competition among HE institutions of Latvia.
3. Higher education with its classical development model of the 20th century lags behind the rapid technological changes of the knowledge society, since it is more difficult to fulfil the requirement for higher education institutions to prepare specialists ready for work in a certain field right after the graduation. Therefore higher education shall change the structure, objectives, and principles.
4. The AHP method significantly supplements other research methods as provides the opportunity for quantitative assessment of experts' valuations.

5. The Analytic Hierarchy Process method indicates that the highest average evaluation was received by Scenario 4 "Regional universities are centres around which regional higher education institutions collaborate and internationalisation takes place". It means that Latvia should develop regional higher education institutions so that they could work in the interests of the regional development.

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Universities as One of Regional Agents - Theoretical Concepts and Approaches

Ginta Kronberga Mg.oec., PhD student
Faculty of Social Sciences, University of Latvia
Riga, Latvia

Abstract. The Latvian National Development Plan (2007-2013) states that knowledge and information are basic resources for the knowledge society and knowledge-based economic development in the regions of Latvia. The main potential of scientific research is concentrated in universities and research institutions. University, as one of the main agent of science and practice, provides creation, management, and transfer of knowledge. Nowadays, the question on higher education in Latvia is extremely important in the situation of economic crisis.
The aim of the article is to present the topical theoretical aspects and approaches on the universities as one of regional agents in the regional development.
The higher education development must focus on the university activities such as - technology and knowledge transfer and university-industry partnerships. The education curricula should be tailored to match the skill demands of local knowledge-based industries. By conducting research and serving as a regional repository of expertise the university heavily influences the abilities of regions to attract and retain technology-intensive companies and provides the regional labour force with modern knowledge skills. Universities should also respond in a flexible way to the uncertain and rapidly changing economic environment.
Methods: document analysis.
Key words: knowledge, regional development, universities, agent network theory.

Introduction

The strategic goal of the European Union is to form a knowledge-based economy, which determines the priority development of education and science.

In its objectives the EU policy indicates that special attention must be paid to development of the peripheral regions of the EU in order to ensure economic competitiveness, social cohesion, and sustainable development. These objectives can be implemented through networks of science and practice, therefore the study of such networks is topical and necessary.

The development of science is unimaginable without the higher education institutions' research activities, exchange of practice and experience, and without integration of the involved agents – universities, research institutes, business incubators, adult education centres, businesses, municipalities, and others. Science and practice networks could ensure mutual integration of all involved agents, which would promote sustainable development of the regions of Latvia.

The main potential of scientific research is concentrated in universities and research institutes. Regional universities, as one of the main agents of science and practice, ensure the transfer of education and knowledge in the regions.

The specific research direction of involvement of universities' research potential in regional development worldwide began to develop in the 1990s. H. Etzkowitz, P. Cooke, M. Feldman, J. Howard, K. Lambert, H. Goldstein, and others may be mentioned as the key representatives.

Within the framework of this article the author seeks to describe the basic theoretical approaches, through which the role of universities in society and their importance in the regions can be looked at and studied, respectively, characterising the universities as one of the regional agents, which are the subject of study in this article.

The research aim is to present the topical theoretical concepts and approaches on the universities as one of regional agents in the regional development.

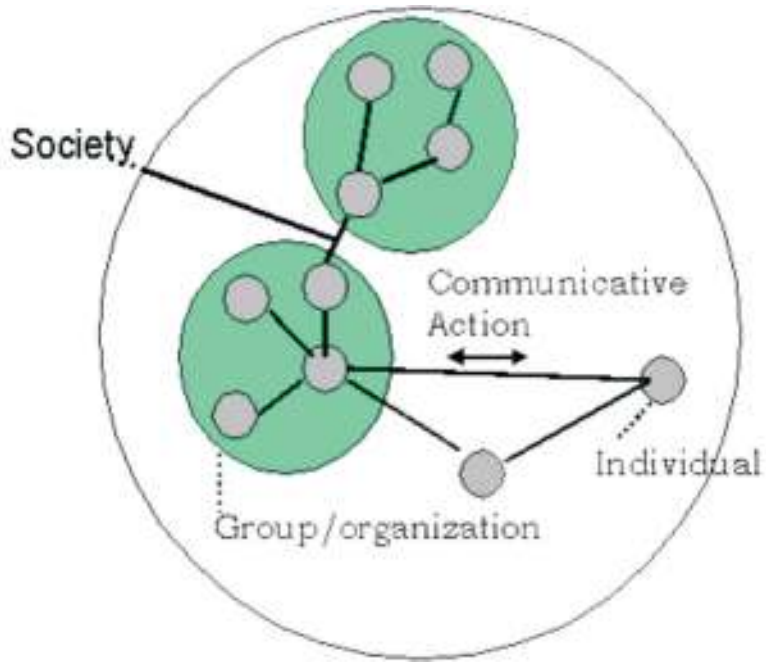
The research tasks are: 1) to describe the theoretical perspectives of networks (guidelines of the social network theory and agent network theory); 2) to characterise the importance and role of universities in the society; and 3) to characterise the universities as one of the regional agents as well as to draw conclusions on the discussed approaches.

Methods: document analysis.

Social network theory and agent network theory

The notion of network is becoming increasingly popular in social science. The concept of networks is becoming increasingly polysemantic – with a wide range of meanings and uses – different types of networks and ties are discussed in all major spheres of life - economic, social, human security, information, information technology, security, and others.

The concept of network is used not only in different contexts, thus obtaining the interdisciplinary nature, but it also can be met in titles of certain



Source: Van Dijk., 2003

Figure 1. **Networks connecting individuals, groups, organisations and societies**

theoretical systems, since a network is the central element of such theories, or their subject of study, or the prism, which allows to study different areas of social life. Development plans of different levels highlight formation, development, and maintenance of cooperation between the agents, which can be described by the concept of cooperation networks. The cooperation networks of various regional agents, which ensure stability, development, and growth of regions in various spheres, are essential to the regional development.

In this section the author briefly characterises basic notions of networks theories – the social network theory and the agent network theory, which allows identification of the most corresponding theoretical concept with the view of describing the object of the study in the following section.

The social network theory. Researchers such as Barry Wellman, Ronald Burt, Mark Granovetter, David Knoka, Ronald Breiger, and many others have contributed to the social network analysis.

Social networks are comprised of social agents and the relations between them. Individuals, social groups, organisations, and others may be included in such networks as social agents. The relationships between the agents are to be understood not only as communication between them, but also as exchange of actions, including conflict situations (Чураков, 2000).

An agent is primarily defined as a single individual or a group of individuals, a collective social unit. The definition of an "agent" in the social network theory establishes that every network-forming unit has a capacity or ability to affect the decision-making of other agents and the resulting behaviour (Wasserman, S. and K. Faust, 1994).

A social network is a "social structure" made of nodes (which are generally individuals or organisations) that are tied by one or more specific types of interdependency, such as values, visions, ideas, financial exchange, friendship, kinship, dislike, conflict, or trade. The resulting graph-based structures are often very complex (Mounge P., Contractor N., 2003).

Network analysis within organisations. In general, network analysis focuses on the relationships between people, instead of on characteristics of people. These relationships may comprise the feelings people have for each other, the exchange of information, or more tangible exchanges such as goods and money. By mapping these relationships, the network analysis helps uncover the emergent and informal communication patterns present in an organisation, which may then be compared with the formal communication structures. These emergent patterns can be used to explain several organisational phenomena (Burt R. S., 1992).

A consensus about the central principles underlying the network perspective has come along with growing interest and increased use of network analysis. In addition to the use of relational concepts, the author notes the following as being important:

- actors and their actions are viewed as interdependent rather than independent, autonomous units;
- relational ties (linkages) between actors are channels for transfer or "flow" of resources (either material or nonmaterial);
- network models focusing on individuals view the network structural environment as providing opportunities for or constraints on individual action;

– network models conceptualise structure (social, economic, political, and so forth) as lasting patterns of relations among actors.

Social network analysis is focused on uncovering the patterning of people's interaction. Network analysis is based on the intuitive notion that these patterns are important features of the lives of the individuals who display them. Network analysts believe that the way of an individual's life depends in large part on the aspect how that individual is tied into the larger web of social connections. Many believe, moreover, that the success or failure of societies and organisations often depends on the patterning of their internal structure (Wasserman, S. and K. Faust, 1994).

The network plays a significant role in the life of the actors of organisations and other public sectors.

Agent network theory (ANT). The brightest representatives of the agent network theory are Bruno Latour, Michel Callon, John Law, and others.

ANT is based on a large number of concepts. The most important concepts are as follows: **Actor** – any element which bends space around itself, makes other elements dependent upon it and translates their will into the language of its own. Common examples of actors include humans, collectivities of humans, texts, graphical representations, and technical artefacts. Actors, all of which have interests, try to convince other actors so as to create an alignment of the other actors' interests with their own interests. When this persuasive process becomes effective, it results in the creation of an actor-network. **Actor Network** – a heterogeneous network of aligned interests. **Translation** – the creation of an actor-network. This process consists of three major stages: problematisation, interessement, and enrolment. Numerous actors within an organisation may be involved in a different process of translation, each with its own unique characteristics and outcomes. For purposes of clarity, it is useful to focus on a single actor, from whose vantage point we wish to see the process of translation. **Problematisation** – the first moment of translation during which a focal actor defines identities and interests of other actors that are consistent with its own interests, and establishes itself as an obligatory passage point (OPP), thus "rendering itself indispensable". **OPP** – the obligatory passage point, broadly referring to a situation that has to occur in order for all the actors to satisfy the interests that have been attributed to them by the focal actor. The focal actor defines the OPP through which the other actors must pass through and by which the focal actor becomes indispensable. **Interessement** – the second moment of translation which involves a process of convincing other actors to accept definition of the focal actor. **Enrollment** – the moment that another actor accepts the interests defined by the focal actor. **Inscription** – a process of creating technical artifacts that would ensure the protection of an actor's interests. **Irreversibility** – the degree to which it is subsequently impossible to return to a point where alternative possibilities exist (Law J., 1992).

While analysing the social processes, the agent network theory takes into account all types of contexts that affect the social environment in which the activity takes place. It follows, therefore, that no agent is excluded from the analysis, should it be cultural or natural, and should it be an individual or a non-living entity. The element, which unifies both agents and contexts, is the network, which, consequently, changes the perception of society as a whole, making no distinction between culture and nature, and putting the hybrids alongside human as equal agents. Therefore, Latour covers all of the key concepts and elements of the agent network theory – the agent, the network, and the social environment.

The agent network theory establishes that the social environment and the society as a whole consist of networks, whose basic units are agents. The function of the network is to ensure the movement between the agents and to connect them in mutual interaction. "Social is nothing more than patterned networks of heterogeneous materials". These "heterogeneous materials" are agents, which are not only living creatures, but also inanimate objects or phenomena (Law J., 1992), and, according to B. Latour's agent network theory, the circulation determines social processes to these agents.

Therefore, the agent network theory focuses on the movement that combines agents' interactions, thus the agent and the network are related to the two levels with the same phenomenon – micro and macro, which is provided by circulation. Studying the structure one cannot ignore the agency and vice versa (Latour B., 1999).

The author concludes that the main difference between the social network and agent network theories is the concept of the agent, which consequently affects the use of the concept of the network. In social network theory the concept of network has a narrower meaning than in the agent network theory; it is determined by the understanding of the network-forming units. In social network theory the network is essentially homogeneous; it also has a profoundly social character, since the agents are social beings, namely, individuals or groups of individuals, which have capacity and reflectivity.

In agent network theory, in turn, the network is heterogeneous. While the social network theory presupposes the existence of interaction links between the agents that form social relationships, in accordance with the agent network theory, such relationships may exist, but they also may not exist, because it is possible that only one link exists between the agents, in particular, when one of the agents is an inanimate object which does not justify social relations. Thus, the agent network theory specifically is the appropriate theoretical concept through which the universities, their created networks and their role in the region as regional agents can be studied.

The next section will describe the theoretical approaches and the latest research findings on regional universities as agents as well as the requirements and functions put forward to today's universities.

The role of universities as regional agents in the society

In today's society, every university has its own intellectual, scientific, cultural and administrative potential.

Magna Charta Universitatum provides that the future of mankind depends largely on cultural, scientific and technical development, and that this is built up in centres of culture, knowledge and research as represented by true universities.

The university is an autonomous institution at the heart of societies differently organised because of geography and historical heritage; it produces, examines, appraises, and hands down culture by research and teaching.

Teaching and research in universities must be inseparable if their tuition is not to lag behind changing needs, the demands of society, and advances in scientific knowledge (http://www.magna-charta.org/magna.html).

The literature describes several types of universities, but, essentially, these can be divided into three types, which differ in certain characteristics that in some cases may overlap or combine.

Due to administrative factors, unique knowledge, intellectual and resource potential the most important universities are ones located in capitals or the national universities. Further, regional universities, which are located in regional centres, may be distinguished, since they undoubtedly, play an important role in the regional development. Such universities typically have developed infrastructure for scientific research, unique libraries, and specialist training centres. Regional universities of the classical type can be divided into the third group; these usually are small education institutions, which were created in the second half of the 20th century and which cannot be proud of unique libraries or teaching staff composition. Universities play an important role in the regional development, and according to modern requirements, the heads of universities must intensively monitor the development trends and the demand for specialists in the region (Шафранов-Куцев Г.Ф., 2005).

The main task of universities is to prepare European citizens so that they perform their role in the knowledge society, in which economic, social and cultural advancement depends on the development and distribution of knowledge and skills. The universities wish to implement innovative goals, which appeared in the Lisbon Agenda, by actively participating in the European Higher Education Area and the European Research Area.

The internationalisation strategies of education institutions are also important. Universities develop strategies, which cover both research and teaching activities in an effort to strike a balance between cooperation and competition in a particular geographic region. Universities shall strive to maintain a consistent dialogue with employers, provide more complete information on qualifications and learning outcomes to school graduates, and to introduce a system for monitoring graduates' working life (Университеты Европы после 2010 года: многообразие при единстве целей).

Having got acquainted with the latest research, the author concludes that universities have a wide range of functions they perform in society and in the region where they are located.

Researchers – Goldstein, Maier, and Luger (1995) identify eight different functions, or outputs, of modern research universities that may potentially lead to the economic development impacts:

1) creation of knowledge;
2) human-capital creation;
3) transfer of existing know-how;
4) technological innovation;
5) capital investment;
6) regional leadership;
7) knowledge infrastructure production;
8) influence on regional milieu.

The last two university outputs are decidedly less well-defined than the six described above. The concept of knowledge infrastructure has become familiar through the literature of economics via endogenous growth theory, as one component of a more extensive concept of regional agglomeration economies.

Knowledge infrastructure can be defined as the stock of knowledge together with the institutional and organisational components that support its growth and application. On the regional scale, knowledge infrastructure extends beyond public and private knowledge-producing institutions to the innovation and learning capacities of firms, workers, and institutions and the network of connections among them.

Finally, the notion of a university influence on regional milieu encompasses the range of distinctive contributions that universities deliver to their surrounding areas, be they intellectual, social, cultural, or recreational, by attracting a concentration of highly educated and creative professionals and establishing a particular location dynamic. These effects are usually imparted unintentionally as a side product of university presence and activity, with such externalities often valued highly by residents, businesses, and other regional stakeholders. Negative externalities may also arise, such as labour-cost increases that may accompany growth in university employment (Drucker J., Goldstein H., 2007).

Knowledge and technology infrastructure is a new concept, which includes private and public agents. Therefore, in order to define this concept, the author chooses an additional definition to the one mentioned above. "Systems of Innovation. Technologies, Institutions and Organisations" edited by Ch. Edquist provides clarification of concepts of knowledge and technology infrastructure.

On the private level, technology infrastructure institutions include industry associations and conferences, training centres, trade publications, collectively established technical standards, branch research institutes, and so on. Public sector institutions include research councils, standard setting organisations, patent offices, universities, research institute systems, libraries, and databases.

Public sector instruments include R&D programmes, legal or administrative regulations, subsidies to capital stocks (especially structures and scientific equipment), and public procurement. We could define the public knowledge infrastructure as consisting of a combination of these institutions and the flow of resources through them (Edquist Ch).

In the author's view, this concept clearly illustrates the agents involved in science and practice networks and shows the importance of public and private sector organisations, innovation, research potential, and cooperation networks. Such role of universities as regional agents appears in a number of theories that provide 4 types of models.

The first model may be coined **the sober view** of the university. According to this model, the university is just another knowledge-based institution, not fundamentally different from knowledge-based business, only perhaps with a greater number and wider range of experts. This model sees the university's relation with the region as one of **exchange** of its knowledge and knowledge workers with the other institutions in the region.

The second model may be called **the social view** of the university. It sees the university as an important critical counterbalance to governing forces and attitudes, be they market forces or mainstream societal attitudes. The public role of the university lies in its ability to widen the access to knowledge and its benefits to as wide a range of individuals as possible. The university would also be the institution that seeks to be the first to identify and define future developments and problems and to offer solutions to complex societal concerns. In this model the university tries to engage in a **dialogue** with regional actors in order to identify their needs and respond to them.

The third model entertains **the creative view** of the university as an institution that is or should be concerned most essentially with optimising and nurturing the creative potential of individuals and of teams. Such optimisation may often involve reserving resources, time, and space for high-risk unpredictable research which cannot be defined ex ante in terms of its impact on regional or other extrinsic development. However, the university's members will still seek a vivid dialogue with outside partners in the regional environment to allow for stimuli and fresh perspectives on their own and other domains so as to realise full creative potential. In this model, the university entertains a relation of **mutual stimulus and support** with other regional actors, in a common attempt to optimise the conditions for such creative environments.

Finally, the fourth model could be seen as **the purist view** of the university, which has been dominant in the Humboldian University. According to this view, the university has to seek a critical distance from its social, political, and economic environment in order to optimise its innovative and early-warning potential. Also, the objectivity of university research is regarded as liable to suffer from close engagement with "real world concerns". While the university's researchers and teachers should convey their findings to the outside world, the process of research itself, and even teaching, should be as separate as possible from such concerns. Seen from this perspective, the "ivory tower" may receive a lot of fashionable bad press but time will show that it has its function after all, bringing sustainable benefits for society in the long-term. The relation of the university with the region is one of mostly **unidirectional knowledge transfer and dissemination** from the university to its stakeholders.

In all of the views, the university is seen as a central actor. These multi-actor strategies and common agendas comprise three major types of actions: 1) joint lobbying of regional actors vis-à-vis national and supra-national funding agencies and policy makers; 2) establishing or expanding common science or technology-oriented infrastructures; 3) establishing intermediary institutions to facilitate interaction between different institutions (Reichert S., 2006).

The author believes that it is essential to study the research potential of Latvia's universities and regional high schools, since such research is a "public good" because its results are freely available to all parties. Without serious research there is no and there will be no possibility to find solutions to the long-term development of national economy.

Universities' investments in research pass to the external agents (industry sector or businesses). Formal and informal interactions between these agents are important, especially with nearby businesses located around universities, because it allows such businesses to implement innovations faster than rival firms located elsewhere (Hegde D., 2005).

During the recent years business incubators and science research parks, covering various sectors of industry, have been developing next to the universities in the regions of Latvia. The nearby universities increase the implementation of R&D strategies in the regions, thus contributing to the development of innovation-based and knowledge-based economy in the regions.

Conclusions

The agent network theory establishes that the social environment and the society as a whole consist of networks, whose basic units are agents. The function of the network is to ensure the movement between the agents and to connect them in mutual interaction.

While analysing the social processes the agent network theory takes into account all types of contexts that affect the social environment in which the activity takes place. It follows, therefore, that no agent is excluded from the analysis, should it be cultural or natural, should be an individual or an non-living entity. The element, which unifies both agents and contexts is the network, which, consequently, changes the perception of society as a whole, making no distinction between culture and nature, and putting the hybrids alongside human as equal agents.

Overall, the necessity not only for creation, management and transfer of knowledge has

intensified, but also for the closer cooperation and goal-oriented action of regional agents, with the aim of creating strategies of development and cooperation, which would ensure sustainable regional development.

A number of initiatives and development strategies are designed by the universities; as an example one can mention university-industry partnerships, patents, curriculum adaptation to the requirements of various industry sectors, technology transfer programme, creation of networks between various regional agents, etc.

Universities pay special attention to increasing of materially-technical and intellectual potential, and intensively adapt institutional management methods and financial monitoring that allow a more efficient exercise of their functions.

Quality management and goal-oriented action is essential on all agent levels, since the existing resources shall be used effectively in order to achieve stated objectives, and the objectives themselves shall be adequate to the market trends and economic situation in general. It shall be able to react quickly to changing conditions in a competitive environment.

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