PROJEKTU UN KVALITĀTES VADĪBA

STRATEGICALLY MOST DEMANDED SKILLS IN FUTURE LATVIA

RESEARCH

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Riga, 2013

The research group of “Projektu un kvalitātes vadība” Ltd conducting the research “Strategically most demanded skills in future Latvia” of the activity “Researches of Labour market” within project No.1DP/1.3.1.7.0/10/IPIA/NVA/001 “Development of medium-term and long-term forecasting system for demand of labour market” of the European Social Fund programme “Human resources and employment” addition 1.3.1.7. activity “Development of short-term and long-term forecasting and monitoring system for demand of labour market”:

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The information necessary for the research purposes from sector representatives – executives, industry association representatives and industry experts as well as national and foreign economy experts was acquired from the surveys conducted by “Dorus” Ltd. Within the activity “Surveys in the labour market sector” of the ESF project of the Ministry of Economics No.1 DP/1.3.1.7.0/10/IPIA/NVA/001“Development of short-term and long-term forecasting and monitoring system for demand of labour market”.

This document expresses the opinion of the group of researchers that in no way can be considered to be reflecting the opinion of the European Community or the state of Latvia.

Researchers: “Projektu un kvalitātes vadība”, Ltd

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SUMMARY

Research "STRATEGICALLY MOST DEMANDED SKILLS IN FUTURE LATVIA" was conducted in several directions and links the theoretical concepts and conclusions on the labour market supply and demand in the context of the dynamics of occupations and skills in the changing market economy environment with pragmatic solutions. The results of this research stage were interpreted with the help of facts and statistics about the previous years in the European Union and in particular developed market economies as well as retrospective data from Latvia.

A detailed theoretical review of the labour demand and skills concept was conducted which included studying the factors influencing the demand for labour, the mutual link among occupations, education and skills in the framework of the classical growth theory models as well as the methods for forecasting the demand for skills. During the research the trends in the demand for labour in the recent 20 years and the factors determining the trends were identified and the analysis of shifts in labour skills and factors determining the shifts was made. Taking into account the economic globalization trends in the world and their influence the structure of the demand for skills was studied as well as its recent trends in Europe, USA and Japan by conducting a comparative analysis.

The researchers particularly focused on the future demand trends for skills in Europe and other countries of the world and linked them with the changes in technologies and labour market polarization as well as the specific character of the demand for skills in knowledge-based work.

To realize the task established for the research, the alternatives for the development of Latvian economy were designed as well as the possible scenarios and trends in the sector demand for labour in the occupational context and the determinant factors of the trends until year 2030 were identified. In completing the task the authors recognized the economy development alternatives and the possible effect of other influencing factors on the demand for skills until year 2030. For the identification of the development alternatives the previously successfully applied quadrant method was used. The development scenarios and future development of the sectors of economy were substantiated by using the elements of the cluster analysis method.

Novelties and practical gains of the research:

- Alternative development scenarios of Latvia economy were created as well as the possible structure of the economic sectors and the dynamics of their proportions by using the cluster analysis approach;
- The factors influencing the changes in the demand for skills and occupations were identified as well as the development directions in Latvia and European countries;
- The long-term trends in the demand for skills in Latvia were forecasted with the consideration of the perspectives of the alternative development scenarios;
- The research of the views obtained in an innovative way of development of Latvian economy alternatives, outlining the sector weightings of and potential changes in the context of labour force skills and competencies.

The research can serve as an Toolkit for the future labour market policy.

Key conclusions of the research:

1. The analysis of the demand for skills in various countries of the world suggests that in recent twenty years a fall in the demand for labour in manufacturing has been observed due to the rise of productivity and development of technologies, however in the service sector, along with the development of new product niches, there has been a growing need for human capital and the demand for educated and skilled labour has been increasing and will continue to do so. This is also confirmed by the growth in the added value created by the service sector both in the world as a whole and in individual regions (in 2010 the global added value created by the service sector grew by 78% compared to 1990).

2. Over recent twenty years the differences in the demand for skills in Latvia and other countries have been determined by the diverse economic development dynamics and structure (in Latvia the transition to market economy was taking place which led to a radical change of its economic structure in less than twenty years. This was facilitated by the integration of the country in the European Union and increasing globalization. As a result, at the beginning of the 21st century the structure of the economy of Latvia became similar to that of the EU and the most developed and biggest countries) as well as the different stages of technological development and productivity.

3. After the accession to the EU the demand for labour in Latvia can be described as extensive – the employers disregarded the negative demographic forecasts and focused on extensive rather than intensive (increasing of productivity) use of resources which did not facilitate the sense of justice among the employees with the necessary qualification as they did not feel that the remuneration corresponded to their qualification. Neither did it facilitate the employees' sense of job security. As a result, the rise in the quality of labour force was not enhanced and the competitiveness of the local labour force was not promoted either.

4. The assessment of the changes in the demand for skills within the occupational groups in Latvia in the recent twenty years led to identifying the following trends:
   - The shifts in the demand for the legislators, senior officials, senior government officials in Latvia have been related to development of the state administration, its expansion during the years of growth and shrinking as a result of the recession reforms. The future demand will depend on the state administration policy;
   - The shifts in the demand for elementary occupations have been related to the economic cycles, however, the demand for agriculture, fishing and related sector occupations has decreased since year 2002 and no effect has been observed in the subgroup from the economic development;
   - The changes in the demand for qualified workers and craftsmen in Latvia have mainly been determined by the development of the construction industry as the mining and construction workers (group OC71) and the metal, machinery and related trades workers (group 72) form the biggest proportion of the major group.

5. In the future the labour market will be significantly influenced by globalization trends – the competition between the developed and developing countries, changes in the demand for labour (In Europe and other developed countries the proportion of elderly labour force will increase,

however, in the development countries the opposite trends will be seen), climate change trends and development of related sectors all over the world – the number of jobs will increase in the renewable energy sector and decrease in the sectors which use fossil energy resources.

6. Until 2030 in Europe and globally the demand for qualified labour possessing the skills for dealing with a complex set of issues will increase. It will be determined by the growing productivity, which will facilitate the demand for the labour force with higher education. Similarly, a significant rise can be forecasted in the demand for the health associate professionals which will basically be determined by the ageing of society. Another rising demand will be the one for engineers, information and communication technology professionals as well as professionals of other technical fields. However, there will be a drop in the demand for the simple skills necessary for physical and routine work. Thus the demand for labour in low qualified occupations with the basic education level will decrease.

7. In Latvia the following trends will be observed in the demand for skills until year 2030:

   - The demand for skills will be determined by the changes in productivity: along with the rise in productivity both in the manufacturing as well as service sectors the volume of the use of production, communication and similar technologies will increase. Moreover, along with the technological development there will also be changes in the general supply of skills.
   - The demand for professionals with tertiary education and with appropriate skills for tertiary education level such as socialization skills, information analysis and interpretation skills will continue to rise.
   - The agriculture sector will experience a competition-driven modernization of economic activity, bigger economic units will develop and as a result the demand for the labour force with elementary skills will decrease in the future and rise for qualified specialists.
   - In the manufacturing sector the drop in the absolute number of employees and rise in productivity are expected. This will facilitate the demand for qualified specialists and decrease the demand for workers in elementary occupations.
   - The expansion of the service sector will generally increase the demand for specialists with communication skills and skills for technology use and application as well as specialists who can independently find solutions and make decisions. The demand for the employees in elementary occupations will decrease in the professions where the labour force can be replaced with technologies (for example, in the transport and communications sector), however, in individual service sectors the demand for the employees in elementary occupations will increase in absolute terms and decrease in relative terms along with the growing demand for qualified specialists. It could be a topical issue for art, entertainment and recreation as well as hospitality and catering sectors.

8. In the future the new skill development will be connected with the development and application of technologies, the "green economy" sector, labour flexibility and mobility, management and organization, communication, public relations, ability to operate in international markets, in a multinational and multicultural environment, acquisition of new (incl. Asian) languages.

Keywords: sector, demand, skills, occupations, trends, development scenarios.

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LIST OF ABBREVIATIONS

CEDEFOP	European Centre for the Development of Vocational Training
CSB	Central Statistical Bureau
EC	European Commission
EQF	European Qualifications Framework
MoE	Ministry of Economics of the Republic of Latvia
ESF	European Social Fund
GDP	Gross Domestic Product
ICT	Information and communication technologies
MoES	Ministry of Education and Science of the Republic of Latvia
NACE	Nomenclature of economic activities in the European Union
SEA	State Employment Agency
OECD	Organization for Economic Co-operation and Development
WB	World Bank
IMF	International Monetary Fund
N/e	National economy

TERM DEFINITIONS

Human capital Stock of knowledge and skills possessed by labour and applicable in production.

Labour market Environment where the mutual interaction between the supply and demand takes place and determines the level and distribution of remuneration[1].

Labour supply Decision of economically active population to engage in a paid job of certain kind at a definite time and place[2].

Labour demand 1) Decision of employers to employ economically active population in a certain job at a definite time and place for adequate remuneration[3];

2) Amount of labour resources with a specific qualification required by employers – characterized by the population employed in various economic sectors and profession groups, as well as vacant (free) positions[4].

Labour productivity Added value per employed person[5].

Economically active population (labour force) Persons of both genders who in the reporting period supply their labour for manufacturing material goods or providing services. Economically active population consists of the employed persons and job seekers (both the ones registered with the State Employment Agency as well as the unregistered ones), who are actively looking for work[6].

Economic activity rate Proportion of economically active population in the corresponding age groups among the total number of population, in per cent [7].

Education level Organizational unit of the education system and the description of the education acquired by a person comprising the acquisition of qualitatively defined and consequently implemented education[8].

New (knowledge) economy Various aspects and sectors of economy producing or actively using innovative or new technologies[9].

Competence 1) Cluster of knowledge and skills in a certain area, issue, field of activity that enables someone to act effectively in various situations[10];

[1] Detailed labour market research in the sectors of national economy, LU, Rīga, 2007. (In Latvian)
[2] Ibid.
[3] Ibid.
[4] Definition offered by authors.
[5] CSB database.
[6] CSB database, available in: http://data.csb.gov.lv/DATABASE/Iedzsoc/Ikgad%E7jie%20statistikas%20dati/Nodarbin%E2t%EEba/NB01.htm
[7] Ibid.
[8] Ministry of Education and Science of the Republic of Latvia, available in: http://www.liis.lv/vi/termizgl.htm.
[9] Restructuring issues the economy of Latvia under the new economy conditions, Scientific monography (ed. By Škapars, R. and Šumilo, E.), University of Latvia, 2005.
[10] Dictionary of Business, available in: http://www.businessdictionary.com/definition/competence.html.

2) Proved ability to use knowledge, skills and personal, social and/or methodological capabilities in study and work situations and in professional and personal development[11].

Qualification Result of an official evaluation and recognition process acquired when the competent institution establishes that a person has achieved training results in accordance with the specific standards[12].

Potential (possible) supplementary labour Persons seeking for job, however unable to assume it, and persons ready to assume work, however not seeking for it [13].

Skills 1) Specific abilities acquired through training or practice and useful for work [14]. Those include abilities to acquire, revive and expand theoretical knowledge and skills, use them creatively in practice for fulfilment work assignments [15].

2) In the European Qualifications Framework (EQF) skills are described as cognitive (using of the logical, intuitive and creative thinking) or practical (comprising manual dexterity and use of methods, materials, tools and instruments)[16].

Skill level The necessary level of education, specialization and practical experience at work that provide for successful implementation of job assignments[17].

Occupation Qualified occupation/kind of occupation (position, trade, speciality) where an employee is required certain education, knowledge, experience and skills[18].

Basic groups of occupation Occupational groups created under the codes of the International Labour Organization in an ascending order by the degree of their similarity (from 0 to 9)[19].

Occupational Standard Theoretical and practical preparedness that enables carrying out the work that corresponds to a certain level of complexity and responsibility[20].

Occupational qualification The documentary assessment of the education and professional mastery corresponding to a certain occupation[21].

Professional qualification levels Division of qualifications by the education degree or programme (there are five occupational qualification levels in the education system of Latvia from 1 (the lowest) up to 5 (the highest)[22].

[11] Recommendation of the European Parliament and of the Council (23 April, 2008) on the establishment of the European Qualifications Framework for lifelong learning (the document refers to EEZ) (2008/C 111/01), Official Journal of the European Union, 6.5.2008.
[12] Recommendation of the European Parliament and of the Council (23 April, 2008) on the establishment of the European Qualifications Framework for lifelong learning (the document refers to EEZ) (2008/C 111/01), Official Journal of the European Union, 6.5.2008.
[13] CSB database, available at: http://data.csb.gov.lv/DATABASE/Iedzsoc/Ikgad%E7jie%20statistikas%20dati/Nodarbin%E2t%EEba/NB01.htm.
[14] Cambridge Business English Dictionary /skill
[15] "Occupation Classifier" ("LV", 299/304 (1360/1365), 21.10.1998).(In Latvian)
[16] Recommendation of the European Parliament and of the Council (23 April, 2008) on the establishment of the European Qualifications Framework for lifelong learning (the document refers to EEZ) (2008/C 111/01), Official Journal of the European Union, 6.5.2008.
[17] "Occupation Classifier" ("LV", 299/304 (1360/1365), 21.10.1998) (In Latvian)
[18] Ministry of Welfare of the Republic of Latvia, available in: http://www.lm.gov.lv/text/80.
[19] Ibid.
[20] Ibid.
[21] National Education Opportunity database, available in: http://www.niid.lv/node/372.
[22] Ministry of Welfare of the Republic of Latvia, available in: http://www.lm.gov.lv/text/80.

Green economy The economy that results in "improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities"[23].

Knowledge Result of the assimilation of knowledge perceived in the study process. A set of facts, principles, theories and practice connected with the area of work or studies[24].

[23] United Nations Environment Programme, available in: http://www.unep.org/greeneconomy/greeneconomyreport/tabid/29846/default.aspx.

[24] Recommendation of the European Parliament and of the Council (23 April, 2008) on the establishment of the European Qualifications Framework for lifelong learning (the document refers to EEZ) (2008/C 111/01), Official Journal of the European Union, 6.5.2008.

Statistics classification of economic activities by NACE 2 edition

CODE	SECTOR
A	Agriculture, forestry and fishing
B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam and air conditioning supply
E	Water supply; sewerage, waste management and remediation activities
F	Construction
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	Transportation and storage
I	Accommodation and food service activities
J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M	Professional, scientific and technical activities
N	Administrative and support service activities
O	Public administration and defence; compulsory social security
P	Education
Q	Human health and social work activities
R	Arts, entertainment and recreation
S	Other service activities
T	Activities of households as employers; undifferentiated goods and services-producing activities of households for their own use
U	Activities of extraterritorial organisations and bodies

Major groups (ISCO 88 ed.)

CODE	TITLE
OC1	Legislators, senior officials and managers
OC2	Professionals
OC3	Technicians and associate professionals
OC4	Clerks
OC5	Service workers and shop and market sales workers
OC6	Skilled agricultural and fishery workers
OC7	Craft and related trades workers
OC8	Plant and machine operators and assemblers
OC9	Elementary occupations
OC0	Armed forces

Education levels (according to ISCED97 classification)[25]

LEVEL	TITLE
Level 0	Pre-primary education
Level 1	Primary education
Level 2	Lower secondary education
Level 3	Upper secondary education
Level 4	Post-secondary non-tertiary education
Level 5	Tertiary education (first stage)
Level 6	Tertiary education (second stage)

[25] Eurostat database, available in: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:International_standard_classification_of_education_(ISCED).

INTRODUCTION

The topicality of the research on strategically most demanded skills in future Latvia is determined by the need to provide the authors of economic structural policies with a wider information base on the processes in the labour market of Latvia and key future challenges related to the structural changes in the demand for skills as well as the compliance of labour force and its ability to adapt to the labour market needs.

The **subject** of the research on the strategically most demanded skills in future Latvia is the demand for skills in future Latvia. For establishing the future demand for skills both the recent trends in the economy and labour market development must be assessed as well as the global processes and comparative advantages of Latvia in the global market. Moreover, it is important to determine the possible alternatives for the long-term economic development of Latvia and the respective resulting trends in the demand for competences and skills. The **aim of the research** is to provide the designers of the economic and labour market policy with a vision about the long-term development alternatives for the economy of Latvia and the resulting trends in the demand for skills and competences recognizing the recent trends in the economic development, global processes and comparative advantages of Latvia in the global market.

The key **tasks** of the research are as follows:

1. To analyse the trends in the demand for skills over recent 20 years in Latvia and the factors that have determined them;
2. To compare the structure of the demand for skills in Latvia and in other countries of Europe and the world and establish the key differences and the factors determining them;
3. To define the economic development alternatives for Latvia until year 2030 and establish the economy sectors the development of which will provide for implementing the alternatives;
4. To assess the foreseeable structural changes in the demand in skills in Latvia both in the economy as a whole as well as within individual sectors until year 2030;
5. To identify the key trends in the demand for skills in Europe and the world until year 2030 as well as identify the factors determining them and their influence on the demand for skills in Latvia;
6. To establish the new skills that will be demanded in the world, in Europe and in Latvia by year 2030 and the factors that will influence them.

Within the research the trends in the labour market development in Latvia between years 1991 and 2011 have been studied by assessing the changes in the demand for skills and the factors determining them as well as the labour market development trends in Europe, USA and Japan have been evaluated by comparing the demand for skills in Latvia and abroad. As a result of the assessment of the possible long-term economic development alternatives and the growth of individual sectors of economy, the key change trends in the demand for skills in Latvia have been determined for the period until 2030. Moreover, the authors have analysed the prevailing trends in the demand for skills in Europe and the world until year 2030 and the factors that will determine them. As a result of the research the development directions of the demand for skills have been established as well as the key factors which will determine the demand in Latvia and other countries of the world until year 2030.

During the elaboration of the research the authors relied on a range of assumptions both regarding the global economic development as well as the local one in Latvia. When assessing the programming documents determining the long-term development of the EU and Latvia and the directions of the economic policy outlined in the documents the assumptions were made that:

- In the world no global catastrophes or political disturbances will take place that might significantly influence the development of civilization;
- geopolitical situation in the European region will basically remain constant;
- the EU will continue to exist and pursue its currently defined development and enlargement principles;
- Planned and systematic change of economic paradigms will take place as well as advancement toward sustainable development, however, over time certain modification and evolution of it is possible;
- Latvia is and will remain an EU member state and will actively integrate in its development processes;
- Natural and social processes are influenced by the time factor, many development aspects are influenced by the uncertainty of the processes that are taking place;
- Over time the structure of the economy of Latvia will approach the level of the developed countries of Europe.

The most important **hypotheses** arising from the research are as follows:

Regarding skills and occupations:

1. The key cause of the low labour productivity in Latvia is the big proportion of employees with general education.

2. The development and improvement of technologies will continue to facilitate the rise in the number of positions belonging to the occupational group of highly educated professionals and managers (the ones who *inter alia* have to deal with intangible work) as well as in the services that can be provided with a low level of education (involving physical work). Consequently, it can be expected that the number of the usual (routine) jobs will decrease.

3. In the future the proportion of employment is expected to rise in such occupations as health care support, protective services, catering jobs, jobs in cleaning and maintaining surroundings, personal care and service jobs as these jobs are hard to automatize or to outsource.

4. The demand will increase for such comprehensive competences as creativity, communication skills, ability to adapt to change, self-organization, self-education, systematic thinking. Along with that the demand might decrease for mathematical thinking skills as with the shrinking demand for routine jobs there will be a lower demand for the ability to do routine calculations.

5. The demand will increase for the specialists with the bachelor and master's degrees and good social skills. However, with the education system continuing to focus only on the depth of specialization and neglecting the development of social and co-operation skills, the knowledge-based companies will continue to require the employees of two kinds – the ones involved in

research and in sales. Thus, the demand will continue to increase both for various specialists as well as the people providing services and working in trade.

On the economic development alternatives and scenarios:

1. Moderate development scenario (which can use the countries like Germany, Ireland, Czech Republic or Austria, Italy and Slovenia as benchmarks) might become true if the proportion of "elementary" services decreased and the proportion of manufacturing sectors increased, i.e., the services with low added value were replaced with the manufacturing activities that have a higher added value.

2. Dynamic development scenario (which can use Denmark, Finland and Sweden as benchmark countries) might become true if Latvia implemented the policy which would promote the use of the latest technologies in the enterprises of the manufacturing sector (which might not increase employment) and would raise the social security of population (i.e., bigger proportion for the state administration and defence, compulsory social insurance, education, health and social care (O–Q)).

METHODOLOGY OF THE RESEARCH AND LITERATURE SOURCES

In order to achieve the goals of research, the researchers have used different qualitative and quantitative methods of analysis: drawing up monographic tables, charts and schemes; the calculation of average and relative values; the design of time series; the analysis of clusters; the development of scenarios using the expert method; the methods of statistical forecasting; forecast methods with the expert method; surveys of experts.

In the course of research the authors focused their attention on the use of officially accessible information of the statistical data. For a detailed analysis of the demanded skills the official data of the Eurostat and CSB database characterizing the national accounts and labour market were used as well as the information from the survey of the State Employment Agency about the labour force. For the purposes of research the required information about the results of the survey of occupations was obtained from the CSB. In addition to the accessible statistical data the survey methods were also used in the analysis when searching for the answers to the questions. the demanded skills abroad the authors used such data base as CEDEFOP as well as the information from different International institutions (World Bank, International Occupational Organizations, IMF, OECD, UNO, a.o. and the researches of foreign scientists about the demanded skills of labour force. In order to determine the options of the economic development, the authors analysed the assessment of the program documents of EU and Latvia ("Europe 2020", "Latvia 2030" a.o.) and the assessment of priorities of the economic development defined in these documents as well as the documents of a long-term sustainable development of other countries (Estonian development strategy "Growth Vision 2018", the vision of the long-term development of the Baltic sea region "Four Futures Central Baltic sea Region 2050", the vision of the development of Russia worked out by the World Economic Forum "Russia and the World: Scenarios to 2025" a.o.). For the purpose of finding a qualitative evaluation of the trends of economic development and the demand for skills, different forecasts about the economic development in the world were collected and compared: the information from the Conference Board: "Global Economic Outlook 2012"; The World Bank: "Global Development Horizons 2011"; National Intelligence Council: "Global Trends 2025: A Transformed World"; Free World Academy: "Global Trends 2030, The World in 2030,"; OECD: "Perspectives on Global Developments 2010: Shifting World"; PriceWaterhouseCoopers: " The World in 2050" a.o., as well as the main factors were evaluated that could influence the demanded skills in the future.

Different classifications were used for the statistical analysis of data:

- The basic occupational groups in the version of ISCO 88;
- The statistical classification of economic activities in the version of NACE 2;
- The educational levels according to the classification ISCED 97;
- The classification of occupations in the Republic of Latvia.

To find out the alternatives of economic development a lot of program documents of the EU and Latvia were investigated, including "Europe 2020" and "Latvia 2030". The greatest attention was paid to the analysis of priorities of the economic development stated in the documents. On the basis of the results of the analysis and by using the expert method the scenarios were created for the assessment of the

alternative economic development of Latvia. Developing a set of scenarios the method of preferable–nonpreferable scenarios was applied, in the framework of which a pessimistic and optimistic future development was outlined but the real scenario is a combination of pessimistic and optimistic ones.

In order to forecast the skills, the experience of labour market analysis in different countries was investigated. It was found out that the choice of the method is basically determined by the access of data and different assumptions about the position of skills in the interaction between the supply and demand of skills in the labour market. Although the scope of the methods of forecasting the demand of skills is very wide, they can be divided into four groups:

- regular, national level, quantitative projections substantiated by the models;
- investigations of sectors or occupations using both quantitative and qualitative methods;
- surveys of the employers, on the basis of which the projections have been worked out;
- forecasting based on the examples of the development of scenarios (focus groups, roundtable discussions, Delphi technique, think tanks), taking into account the opinions of highly qualified experts.

In the research the authors have basically used forecasting with the examples of the development scenarios. The conclusions obtained in the research have been supplemented by the summation of the results received from highly qualified experts in Latvia and abroad as well as from the interviews of the employers.

During the design of the GDP growth projections the assumption was made that the reporting period from year 2012 to 2030 was divided into 3 periods:

1) 2012 to 2014 – the time when Latvia and other countries of the European Union continue their struggle with instability or overcome it which is caused by the financial crisis;
2) 2015 to 2020 – the predictions in the scenarios are taken into account or the structural reforms are implemented;
3) years from 2021 until 2030.

In the first period (2012 – 2014) the assumptions about the recovery time are made based on the conclusions of the world experts (Reinhart, C.M.; Rogoff, K.S.) [26] that on average 3 years are necessary to overcome the consequences in the economy caused by the financial crisis. For the GDP projections of this period the authors used the Eurostat forecasts for year 2011. Starting with 2015 the growth rate of GDP changes depending on the development of the structural reforms in Latvia – the assumptions are made taking into account the dynamic or slow growth scenarios.

For a detailed identification of the processes of the development of labour market the method of the analysis of Benchmark Countries was used. For selecting the benchmark countries, the authors initially stated 3 criteria:

- the number of population,
- territory and natural resources,
- similar history of the economic development.

26 Reinhart, C.M.; Rogoff, K.S. (2009) This Time is Different: Eight Centuries of Financial Folly. Princeton University Press.

Such countries as Estonia and Slovenia met these criteria because of the similarities with Latvia regarding the number of population, territory and the history of economic development. Conducting a further analysis the criteria of the number of Benchmark Countries was extended choosing the countries with a substantially different level of an economic development and the structure of the branches of economy and employment different from Latvia. There were additional criteria for Benchmark Countries, such as:

- Stable long-term economic development (historically stable growth of GDP for 10 – 20 years);
- Added Value per capita by sectors of economy (on the level of NACE 2);
- Skills divided by levels;
- Regional location.

The method of cluster analysis was used in order to find out the adequacy of the chosen countries to the benchmark status.

The analysis of the demanded skills in Latvia was conducted using the labour force survey data of 2011 of the CSB. The data were grouped according to the occupation/position in the basic work and according to the field of education. So, the data were obtained by sectors of economy which was the basis for the evaluation of the existing structure of the demanded skills and they were also assessed according to the scenarios of the economic development, thus, it was possible to make the forecast about the changes of the demanded skills until 2030.

Within the framework of the research for obtaining the information about the specific character of long-term development trends in particular sectors of the economy in Latvia, and in connection with the economic trends in general there were detailed interviews conducted with the following specialists:

- representatives of industries – high rank managers of the enterprises, the indicators of which are above average as to the number of employees and the turnover;
- representatives of industry associations and branch experts (the specialists of the sectors which were suggested by the representatives of the industry associations);
- 20 economic experts from Latvia and 20 economic experts abroad (for the interview there were the experts of macroeconomics and/or labour market selected, but the experts from abroad were the ones having a global or European vision of the situation).

After the tender the company "Dorus" Ltd, was invited to hold the interviews implementing the activity "Interviews in the field of labour market" of the ESF project No. 1DP/1.3.1.7.0/10/IPIA/NVA/001 "Development of medium-term and long-term forecasting system for demand of labour market". The interviews were held from 22 February until 10 May, 2013 totally conducting 265 useful interviews. 893 interviewees were invited to the interviews but 609 people refused the request for an interview. Totally, there were 284 interviews but 19 of them were found to be useless (e.g. the interviewee could not give answers to several relevant questions about the branch industry, etc.), so these interviews were not included in the research. A report was prepared about each interview and also about each sector in general as well as the summary of the interviews with the Latvian and foreign experts.

1. THEORETICAL REVIEW OF THE CONCEPT OF SKILLS' DEMAND

1.1. THE CONCEPT OF THE DEMAND FOR LABOUR FORCE AND THE INFLUENCING FACTORS

The demand for labour is a required amount of labour resources of a particular qualification needed for the employers which is characterized by the employed inhabitants in groups of occupations in different sectors of economy (both in the main job and side job) as well as vacancies (see Fig. 1.1).

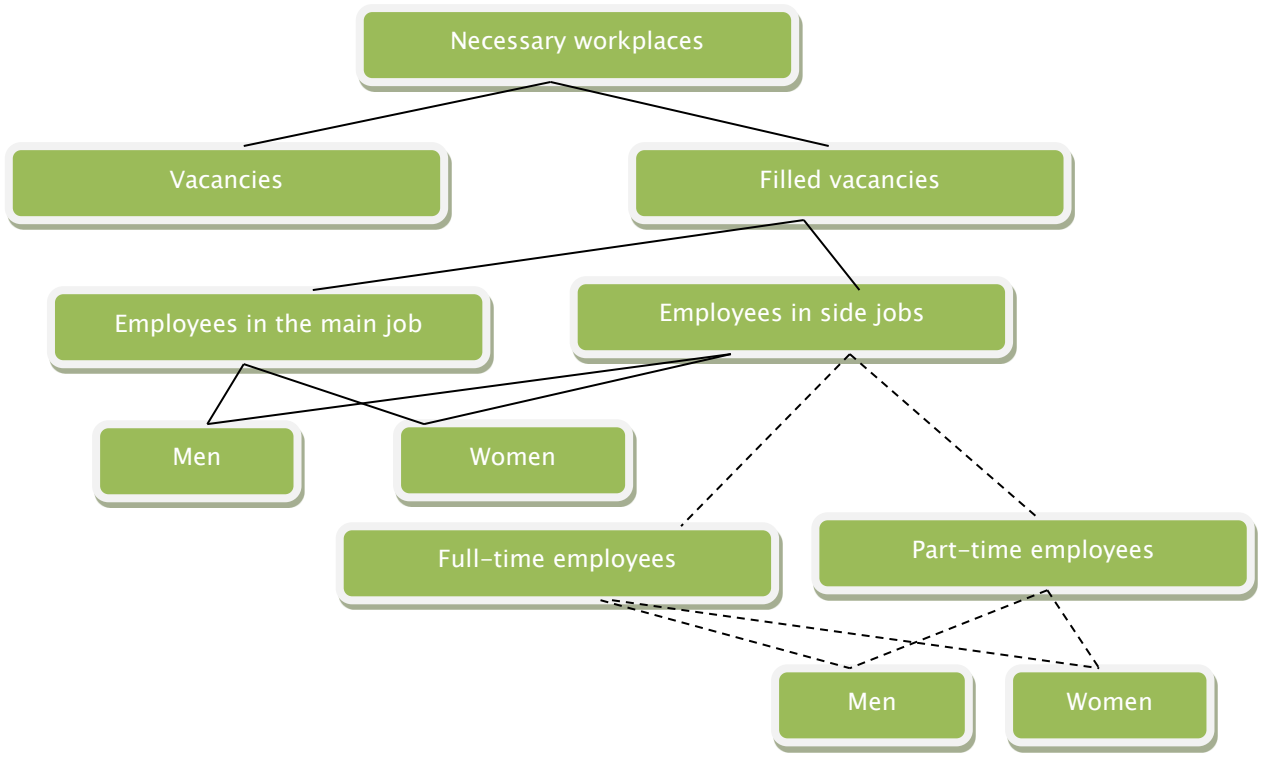

Fig. 1.1. Indicators characterizing the demand for labour[27]

The demand for labour mostly depends on the level of the economic development in the country (economic growth) as well as on the structural changes of economy (growth of the sectors of economy), which shows the demand for the labour force of a particular qualification, accordingly influencing the changes of employment and the structure in terms of particular industries and occupations (see Fig. 1.2). Besides, the demand for labour force is determined by such factors as productivity, the level of technological development, different shocks (the fluctuations of the external and internal demand), discrepancy between the obtained education and skills and the required education and skills of the occupation, the prices of other resources, raw materials and equipment, the prices of the products which have been produced because the demand for labour force depends on the demand for other goods and services.

27 Detailed labour market research in the sectors of national economy, LU, Riga, 2007. (In Latvian)

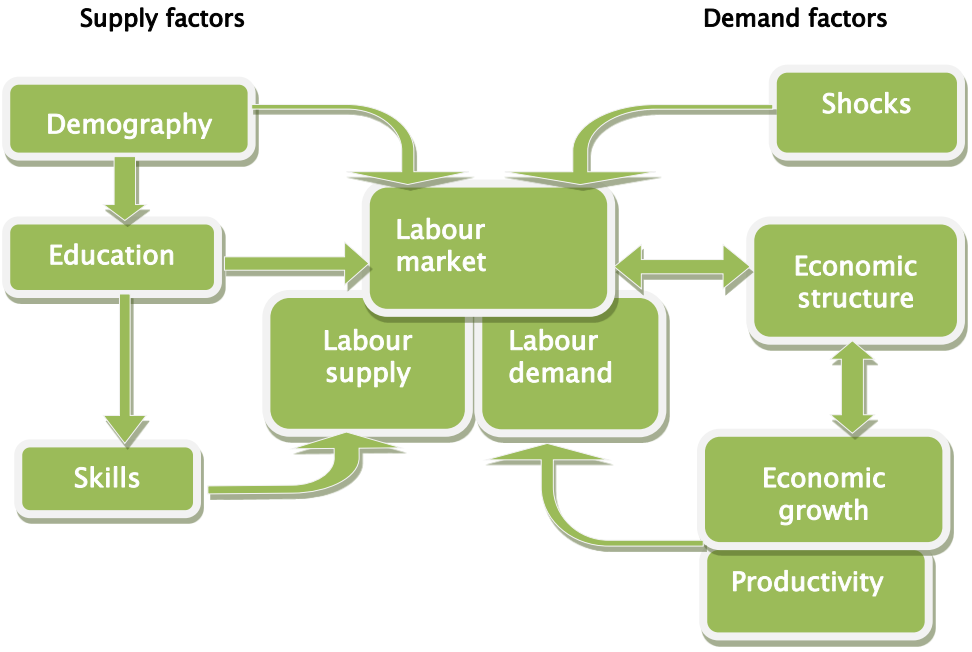

Fig. 1.2. Factors influencing the labour market[28]

Evaluating the factors which influence the demand for labour the factors can be highlighted having direct and indirect influence. The factors influencing directly are the economic growth and productivity. These factors have the basic meaning while forming the demand for labour. The economic growth has a positive influence on the demand for labour (with the growth of GDP the demand for labour increases) but productivity is the factor which exerts negative influence because with the increase of the productivity the demand for labour decreases. The structural changes of economy also have a substantial influence on the demand for labour, as a result of which the structure of the demand for labour changes and the discrepancy can arise between the education and skills acquired and the required education. The production technologies play a significant role among the indirect factors which, on the one hand, influence the productivity of labour force positively but, on the other hand, the structure of demand changes due to the development of technologies (the demand for the employees with a higher education and particular skills increases). Besides, the changes of the demand for labour can be influenced by internal and external shocks (financial crisis, the increase of the prices of raw materials, etc.). To sum up the analysis done about the factors influencing the demand for labour we can make the following conclusion:

- The demand for labour depends on the demand for other goods and services and it is closely connected with the level of the economic development of the country (changes of GDP), the economic structure and the growth of particular sectors of economy, productivity, the level of the development of technologies, the fluctuations of internal and external demand (shocks).

28 Figure designed by authors.

- The demand for labour is characterized by the workplaces needed which is calculated by the filled vacancies (employees in basic work and side work) and job vacancies.
- The factors influencing the labour market can be divided into direct and indirect according to the kind of influence; depending on the direction of the influence there are positive and negative factors.
- Direct factors have the main role in the formation of the supply and demand for labour including the economic growth and productivity.
- Due to the changes of different factors the amount of the demand for labour and its structure can change as a result of which there can be the surplus or shortage of labour force in particular groups of occupations and sectors and in the economy as a whole.

1.2. INTERCONNECTION AMONG SKILLS, OCCUPATIONS AND EDUCATION

One of the factors directly influencing the qualitative and quantitative aspects of the economic growth is the human capital with knowledge and skills. The component of the human capital in the models of the economic growth was introduced after the elaboration of the growth model by R.Solow in the middle of the 20th century, it proved the influence of knowledge of the component on the growth thus retaining its topicality and creating different modifications of the growth models.

On the basis of a long-term economic growth there is a neoclassical growth model (known as Solow-Swan growth model) which is used both for analysing the economic growth in the framework of one economy and several economies. Analysing one economy, most often the economic growth means the increase of output or GDP. The production function in the parametric form is used for the calculations, e.g. for establishing Cobb-Douglas or CES parameters of the production function. In this case the parameter values of the production function have the decisive influence on the research results about the role of different production factors in the economic growth (e.g. the values of the mutual replaceability of the capital and labour force flexibility and the output flexibility against the capital and labour force). In the course of time the neoclassical models were extended so that other factors were taken into account which could influence the economic growth. The extension of the model was mainly in three directions: (a) if the existence of the scale effect is taken into account, (b) if the physical capital is divided into components – the institutional sectors, fixed assets and sectors of economy, (c) if the variables characterizing the quality of labour force (human capital) including the endogenization of the technical progress (i.e. the description of this process with other variables of the model).

The neoclassical growth models can be used and are used in the case of Latvia in order to forecast the demand for labour force by sectors of economy. The method is based on the analysis of industries evaluating them by the physical capital and labour capacity. In Latvia this approach is described in the works of several researchers: Dubra a.o.[29]; Fadejeva and Meļihovs[30], Purmalis[31]. In all the cases each

29 Detailed Study of Labour Force and Labour Market in Economic Sectors. Ministry of Welfare, LR: Riga, 2007, p.224. (In Latvian). National Programme of EU structural funds "Labour Market Research", project "Research of the Ministry of Welfare", No. VPD1/ESF/NVA/04/NP/3.1.5.1/0001/0003. Head of the project: prof. E. Dubra. University of Latvia, 2007, p.224. (In Latvian)

30 Fadejeva L., Meļihovs A. Measuring Total Factor Productivity and Variable Factor Utilization. Sector Approach, the Case of Latvia. Bank of Latvia research #3 / 2009, p.39. (In Latvian)

industry has been evaluated by its production function, but as the data about the physical capital by industries are not available, they are substituted by investments. Changing the assumptions about the basic capital level K_0 and the norm of the capital depreciation δ, the time series of the whole accumulated capital can change:

$$K_t = I_i + \delta \sum_{i=1}^{t} K_{i-1} \quad (1)$$

Therefore, there is a possibility that the influence of the physical capital on GDP over a long period of time could be deviated (underestimated or overestimated). In the case of several countries the models of the economic growth are used in order to explain the differences of the income level among countries. Both the production functions (in parametric or nonparametric form) and the models of the income convergence are used in calculations. The production function in the nonparametric form allows us to investigate the economic growth not defining the restrictions *a priori* for the parameters of the production function.

In the case of Latvia this kind of nonparametric method is used in the works of O.Krasnopjorov[32;33]. The attention is paid to the fact how to explain the differences of the income level among the countries with the differences in the labour productivity and the distance from the curve of technological potentialities. The conclusion is that the accumulation of the physical capital increases the productivity directly (increasing the proportion of the capital against labour force) and indirectly providing opportunities for the country to use more productive technologies. In the same way as in the case of parametric methods the author relies on his assumptions about the accumulation of physical capital but unlike the above mentioned authors who substantiated the choice of parameters by the conclusions of other researches Krasnopjorov substantiates the choice of parameters by the help of the mathematical simulation.

In the neoclassical growth model the available differences of technologies or productivity among countries are supposed to be explained by Solow Residual A which is also called the total factor productivity (TFP) assuming that the total factor productivity does not depend on the provision of the physical capital:

$$Y_t = A_t \cdot F(K_t, L_t) \quad (2)$$

or expressed per capita

$$y_t = A_t \cdot f(k_t). \quad (3)$$

However, according to the observations, e.g. Basu and Weil, the capability of the countries to use the technologies of developed countries depends on the amount of the available capital. Referring to the example of the above mentioned authors, we must say that in Japan (in the country which is on the

31 Purmalis K. Analysis of the labour market of Latvia and its development perspectives. Promotion paper for Doctoral Degree (Dr.oec.). Scientific supervisor: prof. R. Škapars. University of Latvia, 2011. (In Latvian)

32 Krasnopjorovs O. Do Appropriate Technology View Holds in the EU: Explaining Cross-Country Labour Productivity Gaps Using DEA. Proceedings of the International Scientific Conference "Economic Science for Rural Development – 2012", Vol.27 "Integrated and Sustainable Development", pp. 132–138. 2012.

33 Krasnopjorovs O. Оценка производственной функции в условиях неопределённости динамики физического капитала. Актуальные вопросы современной экономической науки. Выпуск №9. Российская Федерация, г. Липецк. Издательство „Гравис", 2012. [approved for publication]

production potential curve) a train of a new generation is launched but it will not influence the total factor of productivity of Bangladesh (the country which is far from the curve of the production potential) because there the basic means of transport are bicycles and the cart pulled by an ox, i.e. a train is not an appropriate technology in this economy. However, increasing the level of the physical capital the rail traffic could start to develop and the interest could arise to apply the technologies of developed countries that could facilitate the increase of the total factors of productivity. Thus, the increase of physical capital facilitates the growth of the total factor productivity in the developing country which represents an indirect effect of the accumulation of the physical capital on the productivity.

In order to take into account the direct and indirect effect of the accumulation of the physical capital on productivity in the classical growth models the total factor productivity is divided into two parts (e.g. Jerzmanowski): the first part characterizes the production potential of a specific country (which depends on the provision of the physical capital in the country) but the second part characterizes the backwardness of the production potentialities in the country (it is also called "the world technology level") or the effectiveness:

$$A_{it} = T_t\left(k_{it}\right) \cdot E_{it} \quad \left(0 < E < 1\right) \tag{4}$$

Inserting the equation (4) into the equation (3) the income level per unit of work or the level of productivity is expressed as the multiplication of the physical capital per unit of work, the condition of the potentiality of the country (at the given variable k) and the effectiveness:

$$y_{it} = f_{it}\left(k_{it}\right) \cdot T_t\left(k_{it}\right) \cdot E_{it} \tag{5}$$

In order to illustrate the expression (5) and the conclusions about the direct and indirect accumulation of the physical capital, let us assume that it corresponds to the basic supposition of the neoclassical model about the production function. The example of relatively assumed countries is shown in Fig. 1.3. The production potential of the world is determined by three countries – A, B and C where the production process is effective, i.e. the effectiveness is the highest among the countries with an equal capital per unit of labour force. But in the country D the income level per unit of labour force is lower than in the country B although the capital per unit of labour is equal to the country B. The output difference between the countries B and D can be explained by the difference of the effectiveness (v+u). However, if we analyse the countries with different provision of the physical capital, all three factors are important – capital, technologies and effectiveness.

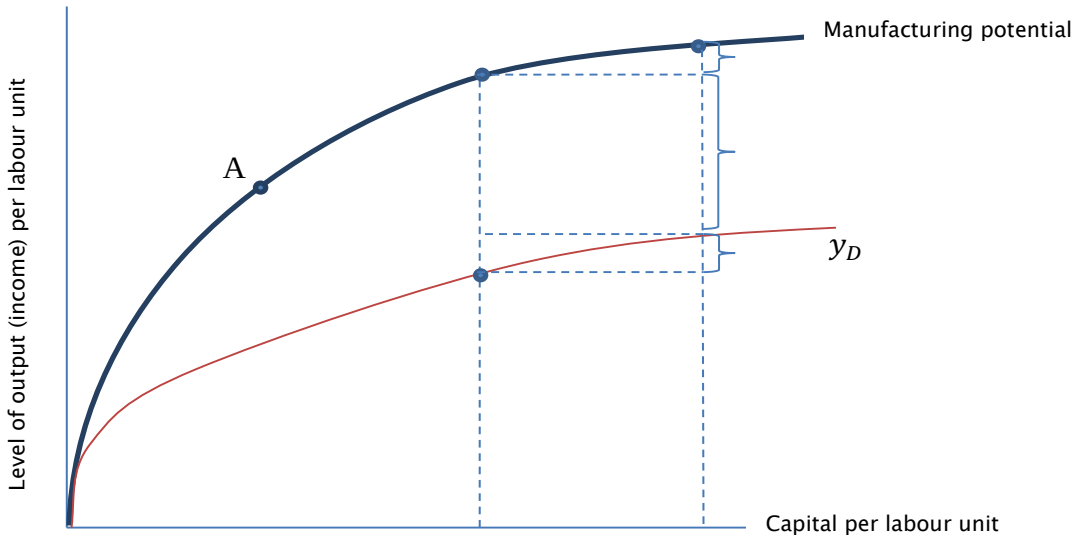

Fig. 1.3. Determining factors of the level of output differences among countries[34]

In the picture the output difference between the countries C and D is equal (u+v+z). The greater the provision of the physical capital, the greater is the output at the same amount of labour and the technologies available. It is the direct (observed) effect on the output of the physical capital or the productivity as it is disused in the neoclassical growth model (in the figure it is the line segment u). Besides, as it has been mentioned above, a greater provision of the physical capital per unit of labour force enables the country to use more productive technologies (i.e. to increase the productivity at the same provision of the physical capital). Thus, it is an indirect effect of the physical capital on the output or productivity (in the figure the length difference of the line segments u and z which can be interpreted as the decrease of the difference of the potential production and actual production, u+v>z+v). It means that the increasing of the capital per unit of labour alone the difference of effectiveness from the potential production decreases from u+v to z+v, however it does not fully eliminate the difference of the effectiveness, z+v>0.

The increase of the capital per unit of labour can be provided, for example, by implementing the policy which is more favourable to the production and investments while decreasing the income tax rates, protecting the property rights more effectively, decreasing the level of corruption, etc. But the economy remains ineffective in comparison with other countries where the capital level per unit of labour is the same. In order to decrease the difference of the potential production and the actual production in the economy more rapidly it is also necessary to ensure the diffusion of technologies. According to the theory elaborated by Nelson, Phelps (Nelson, Phelps[35]) the degree of the diffusion of technologies is increased by a higher level of the human capital available. The interpretation of the conclusion is that a higher degree of the availability of the human capital decreases the costs of the country and its entrepreneurs on adopting complicated technologies or accordingly increase the profitability from the use of these technologies. In the framework of the research of Nelson and Phelps it was concluded that

34 Figure designed by authors.

35 Nelson, Richard R., and Edmund S. Phelps. Investment in Humans, Technological Diffusion, and Economic Growth. American Economic Review, Vol.56, May, 1996, pp.69–75.

the best indicator to characterize the human capital could be the number of years which have been spent to get the secondary or tertiary education. Theoretically, a tertiary level of education and the skills acquired on this level of education are the precondition for the use of complicated technologies.

Although the level of formal education is used as the indicator characterizing skills, already in 1973 in the signal theory of the labour market elaborated by Spence (Spence[36]) a fundamental problem was indicated regarding the use of formal education level in the analysis of the supply and demand of the skills. As to the **demand**, the skills are determined by labour market alongside with the demanded occupations. Particular skills or a set of required skills of particular occupations and their level can be the same for several occupations. So it means that, as the skill sets characterizing occupations are not mutually excluded, we can functionally analyse how the labour market influences the set of demanded skills taken into account the occupations in the labour market but we cannot do a functional analysis of an opposite direction – how the available set of skills (supply) influence the labour market.

As to the **supply**, the skills are developed in the framework of the educational system or directly in the labour market. According to the set of skills and the level of particular skills acquired by an individual we can judge whether the qualification of the individual is adequate to the demanded skills. Here we face a fundamental problem that there exists an information asymmetry between the demand of labour market and the information from the formal education, i.e. which skills an individual must have after a successfully completing an educational level (see Fig. 1.4).

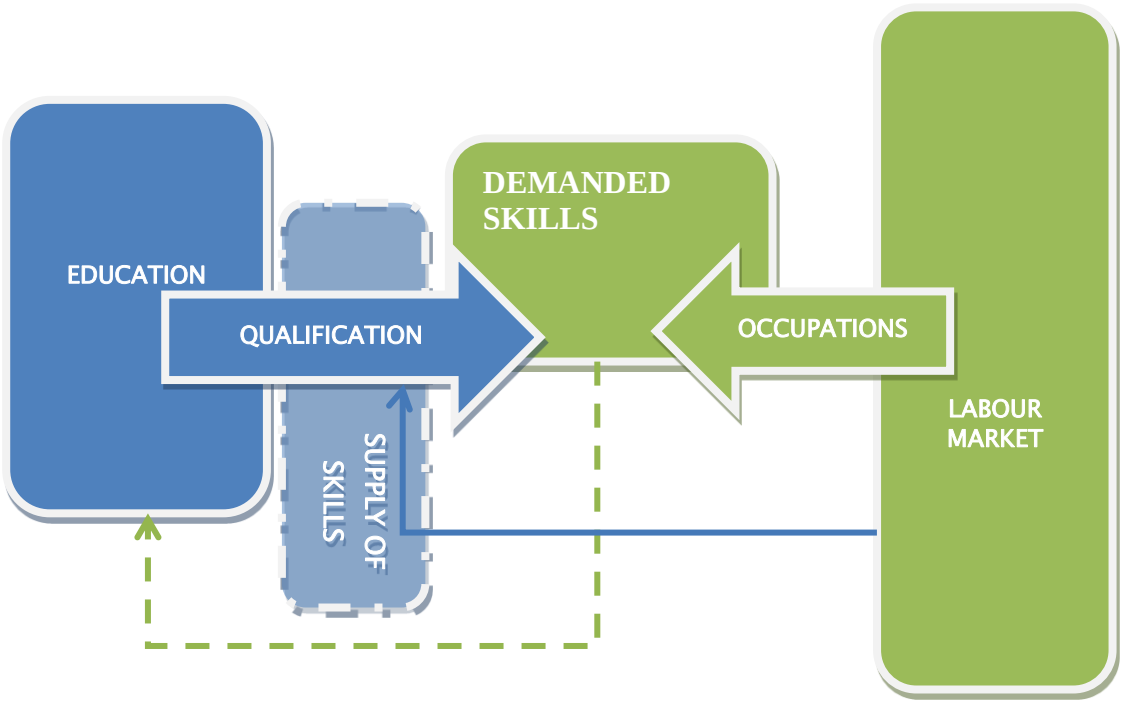

Fig. 1.4. Interconnection among skills, occupations and education[37]

Skills are a particular ability that a person develops through training or experience and are useful in a job[38]. Skills can be general (for example, reading and writing skills) more or less specific, suitable for particular work. General skills can be qualified in the following way:

[36] Spence, M. (1973). Job Market Signaling. Quarterly Journal of Economics, 87, pp.355–374.

37 Figure designed by authors.

38 Cambridge Business English Dictionary /skill – a particular ability that you develop through training and experience and that is useful in a job/.

- communication skills including the knowledge of foreign languages – speaking, listening, writing and reading;
- the skills of quantitative thinking; personal skills – motivation, ability to learn, self-discipline;
- interpersonal skills – team work;
- other skills – the ability to learn and use information and communication technologies, ability to solve problems, physical characteristics, a.o.

In the economic research (for example, in the reports of the World Economic Forum about the Global Competitiveness) reading skills, writing skills and calculation skills are analysed as basic skills. In the Annex of the Recommendations of the European Parliament and Council (18 December, 2006) *Key competences for lifelong learning – European system of standard criteria* eight basic skills for lifelong learning are defined: 1) communication in the native language; 2) communication in foreign languages; 3) mathematical skills and basic skills in natural sciences and technologies; 4) digital skills; 5) learning skills; 6) social and civic skills; 7) self-initiative and entrepreneurship; 8) understanding and manifestation of culture[39].

Skills can also be grouped according to the kind of tasks – skills to perform simple tasks, to perform physical tasks or to perform abstract tasks. Besides, some widely spread categories of skills are discussed, such as learning skills, communication skills, listening skills, creative thinking skills, the skills to set the goals, a.o. The European Qualifications Framework (EQF) describes the skills as cognitive (the use of logical, intuitive and creative thinking) or practical (including manual dexterity and the use of methods, materials, tools and instruments) and divides them into 8 levels. Besides the skills knowledge is also important and it can be divided into the following categories:

- *know-what* – knowledge about facts or knowledge about a certain subject or event. This knowledge is a set of information which is at the disposal of an individual.
- *know-why* – refers to the *scientific knowledge* of *events*. This knowledge is the basis for the technological progress. *Know-why* is created in special institutions, e.g. at universities or research institutions. The enterprises which want to acquire this kind of knowledge usually cooperate with research institutions.
- *know-how* – *operative* knowledge and it means the skills of a certain individual;
- *know-who* – means creating social communication or an effective cooperation, using the knowledge of other individuals (experts).

As a whole *know-what* and *know-why* are the general knowledge acquired in the process of learning and studies, using different databases and similar sources of information. But the knowledge of *know-how* and *know-who* are the knowledge acquired in everyday practice. A detailed description of knowledge, skills and competences according to the EQF level is given in Appendix 1.

The potential employers do not have enough information about the quality of an applicant for the vacancy or his/her skills, but the applicants purposefully get the education in order to send a signal to the potential employers about their quality, i.e. to decrease the asymmetry of information[40]. Education

39 Key competences for lifelong learning Basic skills for lifelong learning – European system of standard criteria, GD of Education and Culture, Luxembourg: Publications Office of the European Union, 2007. (Latvian version)
40 Spence, M. (1973). Job Market Signaling. Quarterly Journal of Economics, 87, pp.355-374.

should be a safe signal if we assume that the applicants with inappropriate qualities cannot fulfil certain requirements in order to complete an educational programme successfully. Therefore, in figure 1.4 the supply and the demanded skills do not overlap but they interact through the formal qualification, the basis of which is the skills acquired in education or practice. This approach contradicts the theory of human capital because it does not emphasize the role of education in the increase of productivity but the education is considered only as an indicator of applicants' qualities not observable otherwise. However, this theory helps to explain why in the occupations with very specific professional tasks, for which the employers should select the employees with the education of a limited number of areas, there are actually the employees with a much wider spectrum of qualifications. So, the formal education is not the best evaluation of the demanded skills but in most cases it is the only accessible indicator which has been regularly considered.

To sum up the above mentioned facts, we can conclude that:

- One of the factors which influence the economic growth is a human capital with knowledge and skills acquired by learning or in practice and are suitable for work.
- Skills can be general or specific, suitable for doing a particular job. Skills can also be grouped according to the tasks to be performed and other indications.
- In the European Qualification Framework the skills are described as cognitive (the use of logical, intuitive and creative thinking) or practical (including manual dexterity and the use of methods, materials, tools and instruments) and they are divided into 8 levels in connection with particular knowledge and competences.
- As to the demand, the skills are determined by the labour market and the occupations required in the market but, as to the supply, the skills are developed within the educational system or directly in the labour market.

2. THE DYNAMICS OF LABOR DEMAND AND DETERMINING FACTORS IN LATVIA

2.1. EVALUATION OF ECONOMY AND LABOUR MARKET IN LATVIA OVER PAST 20 YEARS

In the past twenty years of independence Latvia has experienced both several crises and the periods of growth and development. There was a rapid economic growth when the growth of GDP exceeded 12% a year and there was also a severe recession when GDP decreased by more than 30% a year. Analysing the economy of Latvia from 1991 until 2011 we can point to five periods which are characterized by different trends of development:

1) In years 1991 – 1993 there was an institutional reform (legislative acts and state administration) in order to form the infrastructure corresponding to the model of the market economy which began with the liberalization of prices and foreign trade and concluded with the renewal of the national currency and the ensurance of its convertibility.

2) In years 1994 – 1999 the measures of the stabilization of economy were taken and the economic restructuring took place including the financial sector and the tax reform; the private sector was developed based on the privatization and the attraction of foreign capital. In this period of time there was an additional agreement with international organizations about the allocation of funds and technical assistance.

3) In years 2000 – 2004 the structural reforms began to adjust the economic and legal environment to the requirements of the EU, so that Latvia could successfully incorporate in a common economic space of the EU and could cope with the existing pressure of the competition in the EU as well as adjust its economy to the requirements of NATO.

4) In years 2004 – 2007 there was a rapid and dynamic development of economy, a rapid growth of GDP which was based upon the growth of the domestic and foreign demand and the inflow of foreign capital;

5) In years 2008 – 2011 the economy of Latvia faced an economic crisis which was facilitated by structural and cyclic outside factors and which was characterized by a sharp fall of GDP, high rate of unemployment, rapid increase of the budget deficit and the state debt.

Just after Latvia regained independence (from 1991 until 1993) there was a significant decrease of GDP in all branches of economy and especially in the construction industry where the production volume decreased by 40% in1991 but in trading the added value in the comparable prices was almost by one third less than in 1990. It was mostly influenced by the liberalization of prices which began already in 1990 and also by the abolishment of some restrictions (foreign trade and currency exchange) which was followed by a sharp increase of inflation. Despite the decrease of the volume of production the unemployment rate decreased minimally in 1991, the basic reason of which was the fact that the output of the manufacturing industry, which provided a great number of jobs, was almost on the previous level.

In 1992 the dissolution of the trading system of the former Soviet Union and the former socialist countries continued, as a result of which the export decreased and a lot of big enterprises in Latvia were forced to stop the production. Consequently, the demand for labour decreased and a hidden unemployment began to spread. In 1993 the production volume continued to decrease almost in all branches of economy reaching the lowest point when the level of GDP in Latvia was almost half of that of the GDP in 1990 (from 1991 until 1993 the real GDP decreased on average by 20% every year). As in this period of time the volume of the output decreased more rapidly than the volume of services, the GDP sector structure also changed (see Table 2.1.).

Table 2.1. Total added value in Latvia by the activities of sectors 1990 – 1993 (%)[41]

YEAR	1990	1991	1992	1993
Production sectors	68.1	66.9	52.5	45.5
including agriculture	21.1	21.9	17.2	11.7
fishing	0.8	1.2	0.4	0.1
manufacturing	34.5	35.7	28.2	23.9
Electric-power industry, gas and water supply	1.8	2.3	1.5	7.5
Service sectors	31.9	32.9	47.5	53.2
including trade	5.5	9.1	11.6	8.5
transport	10.9	7.4	17.7	23.1
operations with real estate	4.4	3.7	2.6	3.7
education	2.6	2.7	3.1	4.4
health care	1.8	1.8	2.1	3.0

The second period (from 1994 until 1999) in the economy of Latvia can be characterized as the period of stabilization. In 1994 the growth rate of the service sector remained on the level of the previous year but the general improvement was determined by the fact that the output in the production sector decreased slower than in the previous year (by 7.4%). The proof of the stabilization was also the decrease of inflation. Although in 1995 Latvia experienced a banking crisis which influenced the economic activity and reduced the trends of a positive growth (in comparison with the previous year GDP decreased by 0.8%) but the consequences of the crisis were not long and in 1996 the real GDP in Latvia increased by 3.3% which was due to the development of transport and communication as well as the development of the manufacturing industry. In the following years the growth of GDP was also positive in almost all the sectors (see Table 2.2.) despite the fact that at the end of 1998 Russia faced the financial crisis as a result of which the Latvian enterprises connected with the Russian market were affected.

41 Calculations made following the changes in sector classification, based on the CSB of the Republic of Latvia database [electronic resource]. Available in: www.csb.lv .

Table 2.2. Dynamics of GDP of Latvia (the average increase per year in comparable prices; %)[42]

Periods	1991-1993	1994-1995	1996-1999
Agriculture and forestry, fishing, mining industry and gravel-pit manufacturing	-20,9	-2,7	-1,8
Manufacturing industry	-26.9	-9.2	4.8
Electrical engineering, gas and water supply	-17.4	-1.1	-1.5
Building	-49.7	16.1	9.6
Trading, hotels and restaurants	...	9.2	8.2
Transport and communication	...	6.8	4.6
Other commercial services *	...	-2.3	6.6
Public services **	...	1.4	1.2
GDP	-20.1	-0.5	5.0

*Financial intermediation, operations with real estate, individual households with paid labour force.
**State administration and defence, education, health and social care.

However, we must point out that in the labour market a comparatively low unemployment rate remained during this period of time and the proportion of the number of economically active inhabitants searching for a job exceeded 15%. In 1999 GDP in Latvia was also relatively low (only about 60% from the level in 1990) although in certain service sectors (trading, financial intermediation, a.o.) there was a comparatively rapid growth. It was determined by a greater openness of economy, the liberalization of trading and the movement of capital and a rapid development of banking. But the development of production, as we can see in Appendix 3, was not so successful although until 1990 the growth was facilitated mostly by the development of these branches.

In the third period of time (from 2000 until 2004) there was a rapid growth of economy in Latvia (GDP increased on average by 7.5% each year), the proportion of GDP of the service industry continued to increase. In years 2000 – 2004 building, trading services, transport and communication developed more rapidly than other industries. The production volume significantly increased and the number of employed people in these sectors also increased. The decrease of the demographic burden positively influenced the level of GDP per capita (the demographic burden decreased because of the rapid decrease of the number of inhabitants in the age group up to 14 which was greater than the increase of the number of inhabitants in the age group over 64. However, the unemployment rate was still high, the proportion of the job-seekers among the economically active inhabitants was 10.44% in the year2004, the level of employment in Latvia was also lower than on average in the EU although in the period from 2000 until 2004 it increased by 5 per cent points (see Appendix 2). As to the economic structure in the period of 2000 – 2004 the changes were not big. As in the previous years the three industries were also dominant in the economic structure in the period of 2000 – 2004 – manufacturing industry, trading and transport,

42 Statistics Yearbook of Latvia 1996. Riga, 1996, p.27 (in Latvian) and Republic of Latvia CSB database [electronic resource]. (In Latvian). Available in: www.csb.lv .

the contribution of which to GDP made up more than one third. The proportion of the sectors of the service industry increased from 72.2% in year 2000 to 72.7% in 2004 which was determined by a more rapid growth of trading in comparison with other branches of economy. Dividing by years the growth of three industries was stable – trading and building which mostly based the growth on the increase of the domestic demand and manufacturing which based its growth on the increase of export. The transport and communication industries were rather successful, too. But the economic structure of employment was significantly different from the structure of its added value because of great differences in the level of productivity in different sectors of economy. The primary sector gave rather little contribution to the added value but these branches employed almost 13% of the employed in economy (two times more than on average in the EU). So, we can make a conclusion that already since the beginning of 90-ties and also from 2000 until 2004 the economic growth of Latvia was ensured by the service industry.

Like in the previous years in the fourth period of time (from 2004 until 2007) the economic growth of Latvia continued (GDP grew on average by 10.4% a year and totally by 36.5%). It was largely due to the accession to the European Union which created extra incentives for the economic development (the borders were open for free financial and capital flow which stated a lower price for the financial resources as a result of which the credit volume significantly increased and the domestic demand and a free movement of labour force opened up new opportunities for the inhabitants of Latvia to earn income and to get an experience in other countries of the EU, at the same time causing a rapid emigration of labour force and the increase of labour costs and inflation in Latvia. Despite the rapid growth rate the development of economy of Latvia was not balanced in this period of time. From 2000 until 2007 the proportion of the economic activities of the manufacturing industries decreased but the proportion of GDP of building industry and some branches of the service industry increased. In comparison with four years before the accession to the EU (2000 – 2003) the average growth rate per year in 2004 – 2007 in the financial intermediation and building increased almost twice, in the activities with real estate, lease and other commercial activities as well as in trading the growth rate increased one and a half times. The development of these industries was promoted due to the global low interest rates, a rapid inflow of capital and severe market competition.

In 2008 there was a sharp turn of the direction of the economic development of Latvia. After several years of a rapid increase of the economic growth the growth rate of GDP of Latvia began to decrease rather rapidly and a recession set in. At the beginning there was a gradual correction process but in the middle of 2008 this process accelerated rapidly, especially after the worsening of global crisis in autumn and the following world trade shock. So, Latvia experienced a big fall of domestic and foreign demand, the output in the service industry and production including industrial products decreased. Since the 4th quarter of 2008 there was an outflow of private foreign capital which was mostly determined by a significant decrease of the volume of foreign funds attracted by banks. The economic stagnation influenced the labour market, too, and therefore, the demand for labour force decreased. In the first half of 2008 the indicators showed a vague reflection of this situation but in the first half of 2008 the employment began to decrease and the unemployment rate to increase. The biggest increase of the job-seekers was in the last quarter of 2008 when the amount of them reached 118.7 thousand (the biggest indicator since 2005). In 2008 the number of unemployed people increased by 28.4% (91.3 thousand inhabitants) in comparison with 2007. Despite the rise of unemployment, the level of the activity of inhabitants in 2008 was high (see Appendix 2). It can partly be explained by the increase of motivation to be employed (the increase of wages with the increase of living costs) and the decrease of the demand for jobs in Ireland and Great Britain where a great number of economically active inhabitants had gone in the

previous years. According to the data of SEA in 2008 the number of vacancies sharply decreased. In 2009, when the world financial problems remained, the recession in Latvia continued and the volume of GDP in comparison with the previous year decreased by 17.7%[43] (EU-27, in 2009 the total decrease of GDP by 4.3%[44]). In 2009 just as in 2008 a more rapid decrease of output was in the branches working for the domestic demand. The biggest influence on GDP and the decrease was to the negative dynamics of development in building and trading sectors (the reduction of the trading services decreased GDP by 7.3% points or more than a third from the total downfall of GDP, but the reduction of the output in building (33.6%) accounted for the reduction of the total output of economy only by 3.1 per cent points because the proportion of GDP of building was lower). In 2009 the volume of services connected with other domestic demands also decreased but the transit services of transport, for example, railway transport and the cargo turnover in the ports slightly decreased (in comparison with the year 2008 which were accordingly 4.3% and 2.6%). In 2010 the economic situation in Latvia stabilized and GDP did not decrease so rapidly (in comparison with 2009 GDP fell by 0.3%[45]). A part of the loss of the output volume was structural, therefore the potential increase level on the average terms is lower than in the previous years[46]. Not taking into account the structural changes of economy, which took place in the unbalanced period of time (from 2004 until 2007) in 2010 (after the market corrections) in the economic structure there were the following trends in comparison with the year 2000:

- the proportion of the wholesale, retail, transport, accommodation and catering sectors (G – I) has increased;
- the proportion of professional, research and technical services; administrative and maintenance services (M – N) has increased;
- the proportion of the information and communication service (J) branch has decreased;
- the proportion of the state administration and defence; obligatory social insurance; education; health and social care (O – Q) branches has gradually decreased (see Fig. 2.1.).

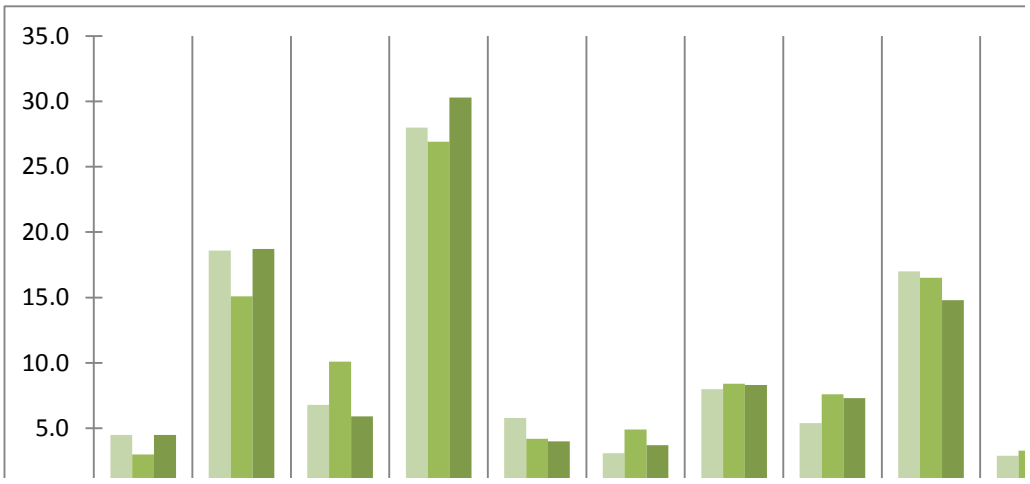

Fig. 2.1. The structure of the economic sectors in 2000, 2008 and 2010, percentage of GDP (NACE 2 ed.)[47]

43 CSB database.
44 Eurostat database.
45 CSB database.
46 *Convergence Programme of Latvia for years 2009-2012.* Riga: Republic of Latvia, Ministry of Finance, January, 2010, p.5. (In Latvian)
47 Figure designed by the authors.

In general, since 1996 in the economic structure of there were no radical changes. The dominant place in this structure take the branches of the service industry, but the production sector makes up about 1/3 from the total added value. The most significant changes of the economic structure were in the first two periods (from 1991 until 1993 and from 1994 until 1999) but since the year 2000 the economic structure of Latvia has stabilized and three industries take the dominant place:

- wholesale and retail (in 2011 it made up 17% from the total added value);
- manufacturing industry which in 2011 made up 14% from the added value;
- transport and storage of goods at warehouses which in 2011 ensured 13% from the added value.

Evaluating the development of the economic situation in Latvia and the key factors the experts of the economy of Latvia have pointed at the achievements and the existing problems[48]. They point out that the year 1998 was very important – the Russian crisis showed that the economy in Latvia was independent. Joining the World Trade Organization, EU and NATO was also very significant for Latvia. The inflow of investments was also pointed out as an achievement, especially referring to the infrastructure projects which involve the co-finance of the EU funds, privatization as well as the transition to the market economy. Most experts put appreciate holding on to the fixed currency exchange rate which has stimulated a stable and safe macroeconomic environment. They emphasize the dynamic development of export. Since year 2000 the export has doubled, its structure has radically changed. In year 2000 the wood-pulp industry made up close to 30% from the total export of Latvia but in 2011 it was only 11%, besides, the wood-pulp export was diverse, the part of the products of machining and chemical industries has increased in the total export. The legislation has been elaborated, the market participants – enterprises have gained experience, and they are able to participate in the world markets. The increase of the average standard of living is significant. One can also see the increase of productivity although it has some negative aspects because the productivity eliminates workplaces. The state has coped with the financial crisis and the financial crisis of the government. According to the experts this aspect is highly evaluated outside Latvia. However, there are several problems pointed out by the experts. The experts think that the significant changes in the global economy during the past 10 – 15 years have not been fully understood, therefore, a lot of questions and problems have not been analysed in connection with Latvia. They involve, for example, the EU and its internal problems, the aspects of the centre and remote areas are rather vivid and influence Latvia, too. The experts also point at the social segregation which is typical of the new member states, the outflow of the labour force, ageing, the foreign credit institutions entering the market, the inflow of cheap money not invested in production but rather in real estate. They indicate the problem that our enterprises are often spontaneously and irregularly sold and there is an insufficient development of the sectors of industry and production with a high added value as well as point at the fact that the government is not able to consolidate the society of Latvia for the achievement of goals and their implementation. We cannot develop the strategy of the economic development, there is not a common plan and vision, there is not a complete understanding about the whole process. The problems are with the fiscal policy, i.e. when the economic growth is rapid, nothing is saved but expended. Some experts point out that the education quality in Latvia is low. It refers not only to the tertiary educational establishments but also to the secondary schools and secondary vocational schools. The experts emphasize the inappropriate administrative territorial reform as a result of which only one

48 Summary of interviews from the "Surveys in the labour market sector" of the ESF projects of the Ministry of Economics No.1 DP/1.3.1.7.0/10/IPIA/NVA/001"Development of medium-term and long-term forecasting system for demand of labour market".

level local government have been created. The regions and civil parishes were abolished and it dramatically influenced districts in where there is a lack of labour force, the local governments cannot give assistance to their inhabitants because of the lack of money. There are significant regional differences which cause the risk of social degradation in certain regions. The experts emphasize a bad condition of the infrastructure, too. A serious problem is emigration, the outflow of qualified labour force and the lack of labour force. The people began to use this opportunity already before joining the EU but mostly after that. It was mostly influenced by big debt obligations which are undertaken by the inhabitants but they cannot repay their credits and are not satisfied with low wages. In comparison with the old Member State of the EU the income level in Latvia is much lower but for simple jobs and functions in absolute terms the employees are paid 3 – 4 times more in old memberstates which cause difficulties for the Latvian enterprise to attract employees. The experts point also at the mistakes which were made during the last crisis which was in the whole world since 2008. Latvia tried to cope with the crisis rather unilateral helping only particular entrepreneurs or certain sectors. For example the banking sector which overcame the crisis rather easily but the assistance was not given to the production enterprises which badly needed it.

The opinion of experts regarding the present situation in Latvia is different. Some experts who were interviewed characterized the situation as very bad but some of them considered it to be good. It is a pointed out that according to the macroeconomic indicators Latvia has already overcome the crisis and it is the second year when the country experiences the growth. However, the situation in regions and in Riga is different, for example, the unemployment in Riga makes up 6-7% but in Latgale it is over 20%. The financial access is also worse both for the production and for the inhabitants, therefore, the renewal of the private consumption is very slow. The well-being of the people is also lower, we have returned to the level of 2006, the people have nothing to invest, there are no savings. One can also see the social degradation of environment. As a result of crisis there are substantial corrections to the economy and the wages are significantly reduced. At present the wages are not back on the level before crisis, which is good from the economic point of view because before the crisis wages were disproportionally high in comparison with productivity. The Law on fiscal discipline has received a positive assessment. For a small economy like Latvia it is important to minimize the negative influence of external factors on the economy. It is also essential that the law states strict criteria for the budget formation decreasing the political influence on the formation of budget. As a positive aspect the experts point out the fact that during the crisis the economic structure in Latvia has changed, it has become more balanced. In Latvia before the crisis the economic development was unbalanced, there was a real estate bubble, the imbalance was in building, financial sector, trading but it disappeared during the crisis. At present in trading and building the GDP proportion is much lower but the structure of the production sectors has become stronger. If the domestic market is not strong enough, then the industries working for foreign markets develop and it helps the import – export balance as well as the payment balance of Latvia which was a problem before the crisis. We can also see positive changes in the investment structure when the productive investments grow more rapidly. Consequently, from the point of view of the macroeconomic structure the situation is much better than before crisis. The reduction of the budget deficit, a stable currency exchange rate and the preparation for becoming a member of euro zone make a safe and stable macroeconomic environment. The crisis management policy has been successful. From unbalanced economy, which was based on the borrowed money, it has become the economy which is based on the increase of the earned money rather than borrowed. However, some experts consider that the reliance on

export is a mistake because it is a risk. The experts express an opinion that the government must find the way to control the financial sector more strictly. There is also an opinion that a rapid development is possible only in the state of being not balanced but in a balanced way we can only stagnate. In this connection we must reckon with the geographical imbalance, with a greater focus on big cities not wasting the funds on the development of the whole territory.

The trends and determining factors of the development of industries are summarized in Table 2.3.

Table 2.3. Development trends of economics sectors and determinant factors in Latvia from 1996 – 2011

SECTOR	TRENDS (Proportion of the sector in the economy)	INFLUENCING FACTORS
A – Agriculture, forestry, fishing	Constant	Technological development, EU agricultural policy, EU and state financial support, climate, migration, global markets (demand changes and orientation)
B–E – Industry, power engineering	Constant	Technological development, (IT application), structural changes of demand, increase of labour costs and capitalization of production, EU policy, alternative energy and renewable resources
F – Building	Increase	Demand changes, access of financial resources, changes of demand structure, migration, changes of technologies and building, prices of resources
G–I –Trading, accommodation, catering services	Increase	Tourism (government policy, international relations), radical changes of demand, fall of demand and increase of demanded quality, change of habits
H, J – Transport, storage, information and communication services	Increase	Oil prices on global markets, crises of sub-sectors, technological development, change of generations, extension of access, legislation and restrictions
K–N – Financial, insurance, research, administrative services; operations with real estate	Increase	Changes in financial markets, decrease of operational costs, strategies of bank operations, saturation of financial sector, access of financial resources, investments of non-residents, government policy
O – State administration and defence; compulsory social insurance	Decrease	Structural reforms, requirements of international creditors, domestic policy, decrease of demand and loss of qualification, common economic development, EU governance of financial resources
P –Education	Decrease	Demographic situation, restriction of financial resources, educational reforms, global competition, state financing
Q – Health and social care	Decrease	Ageing of society, reforms of health care system, transition from treatment to prevention, medical tourism, standard of living of inhabitants, state financing

The structural changes of economy and other factors described influenced the **labour market**, too and changed the division of the employed in the framework of particular industries and groups of occupation.

It has also been pointed out by the interviewed experts of the Latvian economy. According to their assessment the development of labour market so far has not been planned, it has rather been unorganized[49]. It has undergone the cycles of boom and collapse, there was a very rapid growth, especially in such industries as building and trading in 2005 and 2006 which was followed by a sharp fall. In 2007 the employed were also those people who under normal conditions could not find a job. After that came another extreme, in 2009 and 2010 the people with a high qualification and good skills could not find a job, there was a dramatic fall of demand in the market. As a whole, the experts point out several positive features in the labour market of Latvia:

- openness;
- increase of productivity;
- high competitiveness of labour force, the proof of it being the fact that a lot of employees have found a job abroad and they compete well also outside Latvia;
- defining the minimum wage and its increase;
- access to higher education and grants (including EU funds);
- access of different further training and exchange programmes that help acquire additional knowledge and improve the potential of labour force;
- possibility for unemployed to take part in courses, upgrading and changing qualification;
- more often the people take initiative, the self-employment increases stimulated also by the amendments in legislation acts on taxes (introduction of the micro-enterprise tax);
- cooperation among employers, the organizations of employers and State Employment Agency.

However, there are more drawbacks pointed out by the experts, in Latvia the unemployment rate is high, a great part of people are not able to compete in the labour market, the proof of it is a long-lasting unemployment, there are also essential differences among regions. The unemployment rate is also high among young people and the people in the pre-retirement age. At the same time there is a lack of labour force in certain branches of industry and groups of occupations which indicates that there are structural problems in the labour market. Shadow economy is a significant problem which continues to deform entrepreneurship and labour market and there are also enterprises which are founded for a short period of time with the aim to earn quickly and then they disappear. Besides, in Latvia the Labour law is rather strict, accordingly, there is a big bureaucracy and the law could be in favour of the employee who gets different protections but at the same time it causes a counter-reaction from the employers and thus, they promote illegal employment. As a restrictive factor of the labour market the experts mention the large tax burden to the people with low income which totals to almost 40%. In no way does it facilitate the employment of people with low qualification and the creation of new jobs, especially in regions. The high tax burden of labour force also restricts the competitiveness of entrepreneurs in Latvia. It is proved by the research done in Latvia and abroad. The influence of taxes on labour market implies the difference between labour costs of the employers and the wages of the employees. From the point of view of the demand higher costs of labour directly and indirectly reduce the demand for labour[50]. Another serious problem is emigration. Still, there are a lot of economically active people who plan to outflow from the

49 Summary of interviews from "Surveys in the labour market sector" of the ESF project of the Ministry of Economics No.1 DP/1.3.1.7.0/10/IPIA/NVA/001"Development of medium-term and long-term forecasting system for demand of labour market".

50 Assessment of the Competitiveness of Latvia, 2011, Project "Support to introduction of structural reforms in the state administration", Riga, April, 2012. (In Latvian)

country, the same number of people as at the time of crisis. Although the wages are slightly increasing, it cannot stop people from going away because in Latvia the average salary is lower than the social benefits in other countries and it is a substantial drawback in the competition for labour. The political decisions have not facilitated the cooperation between the state administration and entrepreneurs. Namely, the development plans of enterprises and industries were not analysed and so, the conformity of the supply and demand of labour force is not planned, the measures to involve the unemployed people into the labour market have not been taken according to the requirements of employers. Consequently, the vocational schools and the higher educational institutions prepare the specialists "according to their understanding". The courses of retraining for the unemployed people are organized in order to use the EU funds and they are often without a real return. In general, different initiatives of labour market are more directed to the improvement of skills but they are less directed to support the enterprises which can create the workplaces. So, the emphasis lies on the training of people and only then the workplaces will be created but the emphasis must be on creating the workplaces and then the people will be trained for these workplaces. The vocational schools can be involved in this process and rely less on the informal education. There is a typical unconformity between what one learns and what the real situation is which offers the opportunities. As a result, there is a demand for specialists but there is no supply. On the one hand, the people do not have a job but on the other hand other people are needed. The people have studied social sciences for a long time but now the emphasis is on engineering, the sciences, information technologies but still there is no movement towards a potential demand. In Latvia the vocational education possibilities for are not developed. 10 years are late on all levels, secondary vocational, secondary professional and higher professional. At present there are a lot of people with the higher education in the labour market without a particular specialization (lawyers, economists, politologists, sociologists, etc.).

Analysing the changes of the demand for labour force **by sectors** we must make a conclusion that the biggest changes are in agriculture. In the field of agriculture the gross domestic product has increased over the past 10 years (in year 2000 it was 190,913 thousand LVL but in 2011 it was 279,275 thousand LVL), in the percentage the proportion of the field of agriculture has not changed in the corresponding period of time. The number of the employed people in agriculture has decreased in all periods of time mentioned above (in 1996 it was 158.7 thousand but in 2011 – 91.8 thousand). The changes of the demand for labour force can be explained by the modernization of farms, replacing the labour force by technologies, merging and cooperation of farms and the access of the EU funds. The trends of the demand for labour have also changed, in agriculture the demand for a more qualified labour force is growing which can be explained by the introduction of new technologies. A similar situation is in the fishing industry, the number of the employed people over the past 10 years has decreased which can be explained by the modernization of enterprises and the policy of the EU in the fishing industry[51].

In the industry in the period starting from 1996 the proportion of the economic structure has not substantially changed. The employment in industry has decreased since 1996 (in 1996 there were 207 thousand people but in 2011 there were 158.3 thousand). The changes of the demand for labour force

[51] CSB database.

can be explained by the replacement effect and by the scale effect (the development of technologies, the decrease of the production volume, the optimization of the operation of the enterprises)[52].

The proportion of building in the economic structure as a whole has increased in years 2000 – 2004 it was 6.2–6.8% but in 2007 it was 10.4%). There are also appropriate changes in the demand for labour force and it was a marked increase from 2005 until 2008 (in 2005 it was 92.2 thousand but in 2008 it was 127.8 thousand) but during the years of recession it decreased rapidly (in 2010 it was 66.4 thousand). In the period of the economic growth (2005 – 2008) the trend was for a low qualified labour force to move from other fields to building because of higher wages. The reasons for the decrease of the demand for labour force were connected with the financial crisis which affected also the building industry where the production volume decreased (scale effect)[53].

The proportion of wholesale and retail in the economic structure is characterized as constant, only in the years 2005 – 2006 we can see a little increase of the proportion.

The volume in the transport industry has increased until the year 2011 (in 2000 it was 399179 thousand LVL but in 2011 it was 944624 thousand LVL). The sector proportion in the economic structure has increased (in 2000 it was 9.5% but in 2011 it was 13%)[54].

The financial and insurance sector has increased until 2008 (in 2000 it was 130,309 thousand LVL but in 2008 it was 246,671 thousand LVL) but over the years of recession we can see the decrease (in 2011 it was 192,822 thousand LVL). The sector proportion in the economic structure has increased in the period of growth (from 2005 until 2008). The demand for labour force is fluctuating but on average the level of demand does not change, in the period of growth the demand for labour force substantially increases (in 2006 it was 25.1 thousand)[55].

According to the assessment of the interviewed experts the specialists in specific fields are needed in Latvia. The people working in transport and logistics, information technologies, engineering technologies and pharmacy, a.o. need specific skills. Before the crisis there was a high demand for different specialists in building, from builders up to engineers and architects but at present there is a need for the employees in trading (agents, selling specialists as well as in the field of information and communication.

In Latvia over the period of 15 years there is a constant increase of the demand for the employees with a higher education (in 1996 it was 19.3% but in 2011 it was 32.2%) which was influenced by additional factors, for example, in the situation of a higher unemployment, some employees with higher education are in the positions where the higher education is not needed and the salary also can be an additional factor because the person can earn more at a less qualified job. In order to assess the influence of each factor the data about the requirements of the job qualification and the skills of the employees are needed. It would be possible with the introduction of the employment register combining the data with the data from the education register.

[52] CSB database
53 Ibid.
54 Ibid.
55 Ibid.

The demand for the employees with a vocational education and a professional secondary education has a little decreased over the past 15 years (in 1996 it was 45.6% but in 2011 it was 35.1%). The reason for it is the changes of the economic structure, the decrease of production and the development of technologies.

The demand for the employees with a general secondary education has remained constant, in the period of time from 1996 until 2011 it fluctuated within the limit of 21 to 26.5%. We must point out that in all fields of economy there is a high proportion of employees with a general education.

The demand for the employees with the basic (elementary) education decreases (in 1996 it was 11.6% but in 2011 it was 9.4%) and also the demand for the employees with a lower education than the basic one has decreased (in 1996 it was 2.5% but in 2011 it was 0.5%). The reason for it is the automation and mechanization of the production processes as a result of which the demand for the employees with a low qualification has decreased.

The determinative demand is for the employees with the higher education which shows a qualitative development of labour market the reason of which is the technological development of industries, the international competition of enterprises (proof of it is the decrease of the demand for the employees with a lower education). However, we must take into account the additional factors about the employees with a higher education mentioned above.

The demand for labour force is different in different age groups, the most demanded employees are in the age groups 25–34, 35–44, 45–54. The proportion of these groups among employees is considered to be equal. This trend is constant over the last ten years and it shows that the young people and the people before retirement have a greater difficulty to get a job.

We must point out that during the recession (from 2008 until 2010) there was a trend of decreasing of the demand for the employees in the age group of 15–24 that can be explained by the demand of the employers for more experienced employees. The demand for the employees in the age group of 55–64 has a little increased over the past 10 years which also shows that the employers prefer the employees with a bigger experience.

2.2. ANALYSIS OF THE PREVALENT TRENDS OF SKILLS DEMAND AND DETERMINING FACTORS

The demand for the skills of labour essentially changed when Latvia regained its independence and passed from planned economy to market economy. As a result of the collapse of the industrial manufacturing at the beginning of 1990s, there was a significant decrease in the demand for the skills which are connected with the industrial manufacturing of scale and collective farming in the countryside. Simultaneously, in years 1992–1994 along with a rapid development of the private commercial sector there was a significant rise in the demand for the specialists of financial as well as other services. Economic transformation processes explain other, less identified factors in the changes in the demand for skills.

In the second half of 1990s as a result of the land reform and breaking apart of the big agricultural enterprises, the demand decreased for the persons employed in agriculture, both qualified and less qualified. The implemented land reform not only returned the previously nationalized estates to their former owners or their heirs, but also set forth new skills the successful acquisition of which could serve as a significant pre-condition for the development of business in the countryside and rural settlements.[56].

The demand by major occupational groups and subgroups (at the level of 2 signs) is shown in Appendix 3.

The analysis of the employment of the population of Latvia by profession (group OC1-9) suggests that the demand for the first major group did not essentially change between 2002 and 2010, however, significant changes took place in the subgroups of this major group. The demand for senior government officials (minor group 12) was stable until year 2005, it increased during the growth period which can be explained by the expansion of the public sector during the period, and however, during the recession it slightly decreased in connection with the reforms made in the state administration. Senior government officials represent the biggest proportion in the first major group. The demand for legislators and senior officials (group OC11) was stable until the growth period, during the growth period it increased due to the expansion of the public sector and decreased as a result of the reforms of the recession period. The demand for general managers (group OC13) decreased during the growth period which can be explained by reforms in the state administration.

In period 2002-2011 the proportion of professionals significantly increased in the employment structure (major group OC2), that was very distinct in year 2009. It can be explained by the expansion of the public sector during the growth period (2005-2007), as well as the role of the job remuneration reform in the public sector which involved documentary renaming of many associate professionals senior professionals and it was not necessarily related to changes in their level of skills. Professionals accounted for the biggest proportion of the employed persons in 2011 – 16.58%). Analysis of the causes for the increase of the senior specialists in 2005-2007 suggests that there has been a particular rise in the demand for senior teaching professionals (group OC23) and other senior professionals (group OC24). The rise in the demand for senior teaching professionals can be explained by the increase of the number of students in the respective period. The rise in the demand for other professionals can be explained by the changes in the public sector in the respective period.

The demand for technicians and associate professionals (major group OC3) had decreased until the growth period, a rise in the demand could be seen in the growth period (in 2005 – 134.13 thousand, in 2008 – 186.49 thousand). It can be explained by the expansion of the governance sector. A fall in the demand was observed in years 2009-2011 when reforms took place in government institutions and remunerations. Slight changes in the demand (rise in the growth stage, decrease during the recession) can be observed regarding the specialists of physics and engineering (group 31) which can be explained by the changes in the construction sector in the corresponding period that was caused by the changes in the demand for housing and availability of financial resources. The demand for teaching associate professionals (group 33) decreased in the growth period due to the rise in the number of the teaching

56 Detailed Study of Labour Force and Labour Market in Economic Sectors. Ministry of Welfare, LR: Riga, 2007, p.224. (In Latvian).

professionals (group 23) in the corresponding period. The biggest proportion in the third major group belongs to other associate professionals (group 34). The demand for other professionals significantly increased in the growth period and decreased during the recession by almost reaching the level of 2002. The changes in the demand for other associate professionals are connected with both the changes in the state administration as well as economy as a whole.

The demand for clerks (major group OC4) increased until the growth period, stayed stable during the growth period and could also be considered constant during the recession. The biggest proportion in this major group is represented by office clerks (group OC41). Accordingly, the office clerks determine the change in the major group as a whole. An exception was seen in year 2010 when the demand for customer services clerks (group OC42) increased both in absolute and relative terms. It can be explained by the structural changes that had taken place in the economy and general rise in the proportion of services, however, it creates a certain concern about the efficiency of using these categories of labour force and the level of productivity. In some case the willingness to create new jobs might have worked which might be disputable in terms of efficient use of the labour force as a whole.

The demand for service workers and shop and market sales workers (major group 5) is to be considered stable both in absolute terms as well as in terms of the employment proportion. It can be explained by the growth of the service and trade sector determined by a stable demand and considerable proportion of the sector in the economy. The proportion of the persons employed in the group is comparatively high (in 2011 – 14.86%). The demand for personal and protective services workers (group OC51) increased in the growth period and decreased during the recession. The opposite trends were observed regarding the demand for models, salespersons and demonstrators (group OC52). This is related to the reduction of the overall economic activity during the recession period as well as changes in the welfare level of the population. The rise in the demand for models, salespersons and demonstrators in 2010 can be explained by the stabilization of economy and growth of the trade volume.

Another significant trend is the decreasing of the proportion of skilled agricultural and fishery workers (major group OC6) (in 2002 – 8.4%, in 2011 – 3.83%). It can be explained by the reduction of the employment in these sectors. This is the major group with the lowest proportion of employees. The changes in the demand for market-oriented skilled agricultural and fishery workers (group OC61) are the decisive ones in relation to the changes for the demand for the major group as a whole. The demand for subsistence agricultural and fishery workers were fluctuating however has to be assessed as constant.

The demand for craft and related trades workers (major group OC7) decreased from 146.1 to 189.87 thousand in period 2002-2007. During the recession a rapid decrease was observed (2010 – 110.62 thousand) caused by the fall in sector volumes and structural changes in the economy. The proportion of the employees of this group is comparatively high, in 2011 – 12.59%, 2006 – 17.09%). The decisive role in the changes of the demand for the major group belonged to the changes in the demand for extraction and building trades workers (group OC71) which were determined by the development trends of the construction sector in connection with the changes in the demand for housing and availability of financial resources. The demand for metal, machinery and related trades workers (group OC72) remained constant until the growth period, it slightly increased during the growth period and significantly decreased during the recession. These changes were also determined by the development trends of the construction

sector. The changes in the demand for precision, handicraft, printing and related trades workers (group OC73) and other craft and related trades workers (group OC74) were small.

The demand for plant and machine operators and assemblers (major group OC8) was stable with a slight decrease during the recession – from 111.14 thousand in 2008 to 90.95 thousand in 2010. The demand for stationary-plant and related operators (group 81) demonstrated a gradual and slight rise until year 2008 and fell in 2009 and 2010 below the level of 2002. This can be explained by the overall manufacturing trends, technological development, changes in the demand structure and capitalization of manufacturing. The demand for machine operators and assemblers (group OC82) and drivers and mobile-plant operators (group OC83) was stable until 2005, starting from 2006 the demand decreased – possibly due to more efficient vehicles and use of more modern machinery, and during the crisis – along with a significant reduction of production volumes which led to smaller demand for the workers of the respective occupations.

The overall proportion of elementary occupations (major group OC9) remained constant in years 2002-2011 which can be explained by the labour mobility in changing jobs across sectors. The demand for the elementary occupations was fluctuating, in 2002-2005 it decreased from 134.9 to 125.74 thousand. During the growth period the number of workers in elementary occupations reached 150.86 thousand in 2008 due to the growth of the construction sector. Accordingly, the shrinking of the construction sector led to the fall in the demand for elementary occupations, accounting for just 126.07 thousand. The proportion of the employed persons of this group has to be considered quite high (in 2011 – 14.44%). The most considerable changes were the ones in the demand for labourers in mining, construction, manufacturing and transport (group OC93). During the growth period the demand for this group considerably increased, however during the recession there was a fall in the demand which can be explained by the growth of the construction sector which was influenced by the changes in the demand for housing and availability of financial resources. Since 2002 the demand for agricultural, fishery and related labourers (group OC92) has been decreasing, with the exception of year 2006 when there was a slight rise. These changes were due to the overall development of agriculture, modernization of farms and technological development.

Generally, in the period after the accession of Latvia to the European Union in years 2004 – 2008 the demand for labour in Latvia can be considered extensive. As the results of the survey of employers made within the MW research "Detailed research of labour and labour market across economic sectors"[57] confirm, employers, disregarding the negative demographic forecasts, focus on extensive rather than intensive (raising productivity) use of resources. The insufficiency of labour supply raised the topicality of such issues as excessive protection of employees' rights in legislation and the need for labour immigration while no concern was given to labour force emigration.[58] In order to solve short-term labour problems employers lowered the requirements regarding the applicants' education and experience[59] in 1/5 of all cases of recruiting people for jobs, which did not facilitate the employees' sense of justice regarding the remuneration that corresponds to their qualification and their sense of job security. As a result, disregarding the overall fast economic growth, the rise of labour force quality was not facilitated

57 Detailed Study of Labour Force and Labour Market in Economic Sectors. Ministry of Welfare, LR: Riga, 2007, p.224. (In Latvian)
58 Ibid., p.105-107.
59 Ibid., p.127.

and the competitiveness of local labour force was not enhanced either. The relieved labour mobility regulations within the EU, the significant difference between the income in the elementary occupations in the developed European countries and Latvia and, importantly, the environment where changes were taking place for facilitating labour market flexibility, however, not facilitating a simultaneous sense of job security among the labour (no flexicurity principles were observed) were the factors that promoted the emigration of the workers of elementary occupations as well as emigration of the representatives of other occupations.

In the figures below (see fig. 2.2; 2.3; 2.4) employment changes for **10 most demanded occupational groups are shown** in period 2002 – 2010. Pointed out are corporate managers (group OC12), other associate professionals (group OC34) and other professionals (group OC24) as namely in the groups of professionals the number of the employed persons is the biggest.

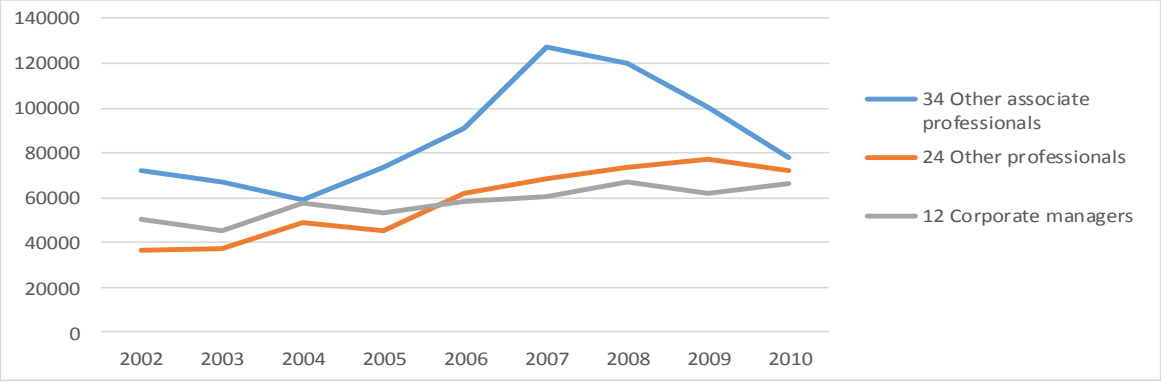

Fig. 2.2. Employment of corporate managers and professionals[60]

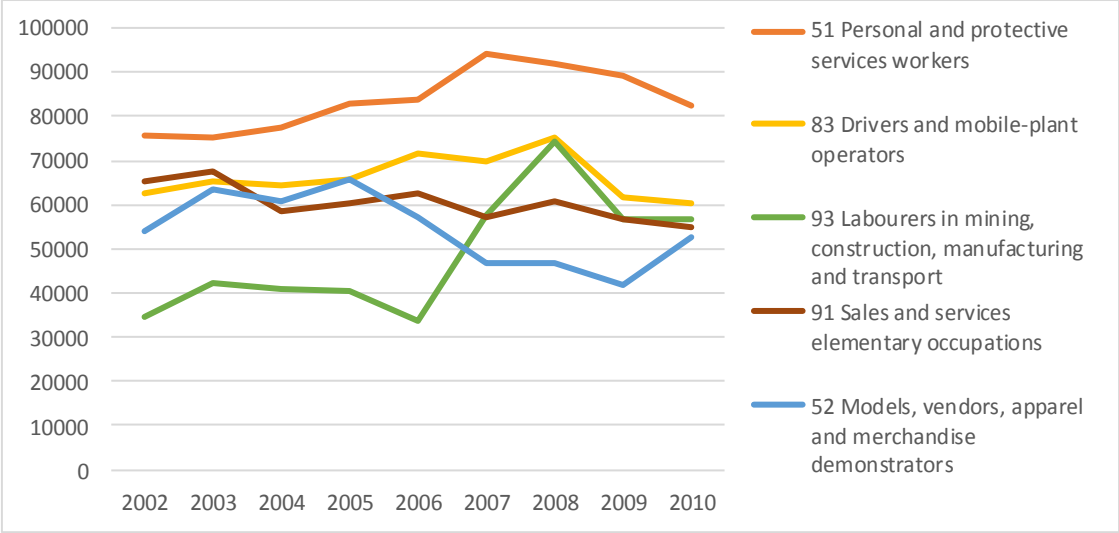

Fig. 2.3. Employment of the most demanded occupational groups (5 most demanded occupations besides corporate managers and professionals)[61]

60 Figure designed by the authors based on the Labour survey data.
61 Figure designed by the authors based on the Labour survey data.

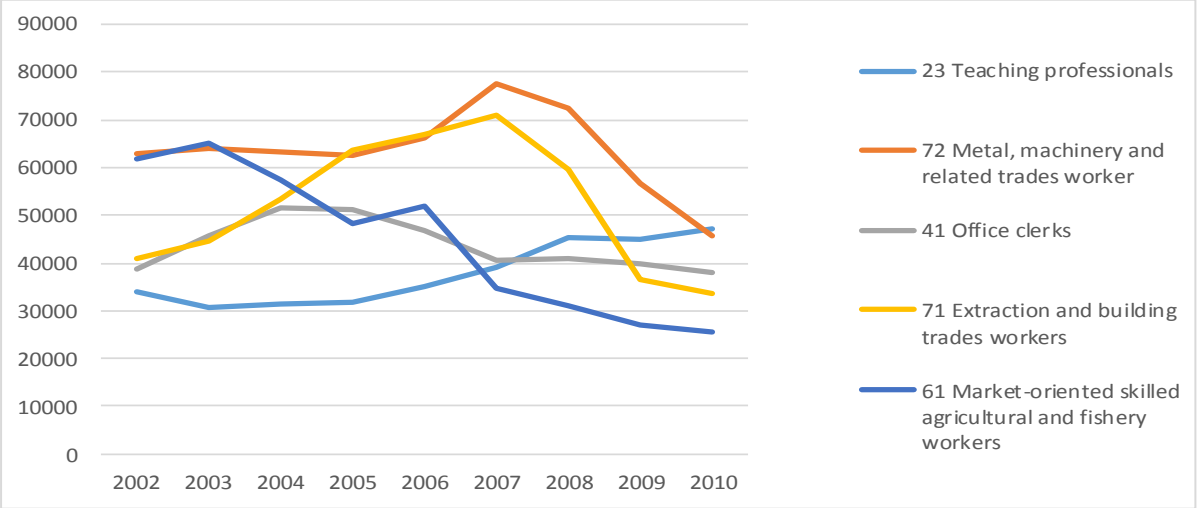

Fig. 2.4. Employment of the most demanded occupational groups (second 5 most demanded occupations besides corporate managers and professionals)[62]

The overall summary of the trends in the demand for skills prevailing in the labour market of Latvia is shown in table 2.4. As a result of the assessment of the factors influencing the demand the kind of the influence (direct or indirect) was established as well as their extent (significant or insignificant).

Table 2.4. Trends in the demand for skills prevailing in the labour market of Latvia in 2002–2010, determinant factors, kind and extent of influence

OCCUPATIONAL GROUP	OCCUPATIONAL CODE	TRENDS	INFLUENCING FACTORS	KIND OF INFLUENCE	EXTENT OF INFLUENCE
Personal and protective services workers	51	Downward	Social welfare Change of habits	Direct Indirect	Significant Insignificant
Drivers and mobile-plant operators	83	Constant	Technological development (use of IT) Structural changes in the demand Rise in labour costs and manufacturing capitalization	Direct Indirect Direct	Significant Insignificant Insignificant
Labourers in mining, construction, manufacturing and transport	93	Upward	Change in the demand Changes in the demand structure Migration Changes of technologies and construction methods	Direct Indirect Indirect Direct	Significant Insignificant Insignificant Significant
Sales and services elementary	91	Downward	Tourism (national policy, interstate relations) Radical changes in the	Indirect Direct	Significant Insignificant

62 Figure designed by the authors based on the Labour survey data.

OCCUPATIONAL GROUP	OCCUPATIONAL CODE	TRENDS	INFLUENCING FACTORS	KIND OF INFLUENCE	EXTENT OF INFLUENCE
occupations			demand Fall in the demand and rise in the quality demanded Change of habits	Direct Indirect	 Insignificant Insignificant
Models, salespersons and demonstrators	52	Downward	Population welfare Changes in the demand Change of habits	Direct Direct Indirect	Significant Significant Insignificant
Teaching professionals	23	Upward	Demographic situation Limited financial resources Education reforms International competition	Indirect Indirect Direct Indirect	Significant Significant Significant Insignificant
Metal, machinery and related trades workers	72	Downward	Technological development (use of IT) Structural changes in the demand Rise in labour costs and manufacturing capitalization EU policy Price of resources	Direct Indirect Direct Indirect Indirect	Significant Insignificant Significant Insignificant Significant
Office clerks	41	Downward	Structural reforms Domestic policy situation Fall in the demand and decreasing qualifications. General economic development Administration of EU financial support	Direct Indirect Direct Indirect Indirect	Significant Insignificant Insignificant Significant Insignificant
Extraction and building trades workers	71	Downward	Changes in the demand Changes in the demand structure Changes of technologies and construction methods Price of resources	Indirect Indirect Direct Indirect	Significant Insignificant Significant Insignificant
Market-oriented skilled agricultural and fishery workers	61	Downward	Technological development EU agriculture policy EU and national financial support Development of large-scale farms	Direct Indirect Indirect Direct	Significant Significant Significant Significant
Other associate professionals Other professionals Corporate managers	34 24 12	Upward	According to the sector of employment	Depending on the factor and sector	Depending on the factor and sector

As the data summarized in table 2.4. suggest, in Latvia the demand for various professionals is increasing, however, the demand for clerks, market-oriented skilled agricultural and fishery workers, extraction and building trades workers is decreasing. The demand for workers in various elementary occupations as well as drivers and mobile-plant operators has been relatively stable. The key conclusions about the changes in the demand for labour skills and respective determinant factors are as follows:

- The demand for market-oriented skilled agricultural and fishery workers has decreased since 2002 and is not directly attributable to the economic cycles. Over recent years the reduction rate has decreased. It can be forecast that in the forthcoming years the demand for market-oriented skilled agricultural and fishery workers will continue to decrease, however, depending on the national and European Union agriculture policy, the stabilization of the demand is possible and even a slight growth.
- The shift in the demand for legislators, senior officials and managers has been connected with the development of the state administration, its expansion during the growth years and shrinking as a result of the recession reforms. The future demand depends on the policy of planning the state administration.
    - The demand for professionals showed an upward trend until 2009. It particularly concerns the group of other professionals (group OC34).
    - The shift in the demand for elementary occupations is connected with the economic cycles, however, the demand for agricultural, fishery and related labourers (group OC92) has decreased since year 2002 and economic development has not had a visible effect on it.
- The demand for plant and machine operators and assemblers (major group OC8) was stable until 2008, however a downward trend was seen during the recession. The shifts in the demand for stationary-plant and related operators (group OC81) and machine operators and assemblers (group OC82) are not attributable to the phases of the economic cycle. The demand for automated assembly line and industrial robot operators is influenced by the economic development, including the development of the construction sector.
- The shift in the demand for craft and related trades workers (major group OC7) in Latvia has mainly been influenced by the development of the construction sector as the extraction and building trades workers (group OC71) and metal, machinery and related trades workers (group OC72) account for the biggest proportion in the major group.

3. GLOBAL TRENDS IN THE DEMAND FOR LABOUR FORCE AND SKILLS

3.1. STRUCTURE OF THE DEMAND FOR SKILLS AND DYNAMICS OF ITS CHANGE IN EUROPE AND OTHER COUNTRIES OF THE WORLD

The assessment of the labour market demand trends and structure of the demand for skills in Europe is made possible by the data from the European Commission Vacancy Monitor (available since 2010)[63]. The information compiled there suggests that in the first quarter of 2012 the filling of vacancies was steadier in the segment of the lower-skilled occupations, however, the demand was growing for the specialists with a higher level of skills – clerks, professionals, legislators and other occupations[64].

The information on the vacancies from the European Vacancy Monitor, however, does not enable distinguishing the long-term trends in the demand for skills in the occupational cross-section in individual sectors of economy. Consequently, to analyse the structure of the demand for skills the authors used the statistics on the satisfied demand for labour (filled vacancies) which is presented by the employment indicators of the European countries. The analysis of the European labour market comprises 30 countries (EU-27 countries as well as Iceland, Switzerland and Norway) regarding the changes in their employment and unemployment levels in 2008 compared to year 2000 as well as 2010 compared to 2008 in order to assess the influence of the global economic crisis on the labour market of the respective country. To evaluate the **changes in the demand for labour** the employment trends were analysed in individual occupational groups as well as determinant factors of the changes. As it was mentioned in the theoretical part, one of the most significant factors determining the demand for labour is the sector structure of an economy. Within the analysis of the sector structure of economy the distribution of the added value across 4 sector groups was analysed:

- agriculture, fishing and forestry (A);
- manufacturing (B-E);
- construction (F);
- service industries (G-U).

The authors also evaluated the sector structure of economies and its trends in Europe from year 2000 to 2010. As a result of the structural changes in their economies the majority of European countries reported the decrease in the demand for labour in such sectors as agriculture, fishing and forestry (A) and manufacturing (B-E), however, there was an upward trend in the demand for various specialists in service industries. The most significant role among all service sector industries (both by added value and number of employees) in Europe belongs to the wholesale and retail, transport, accommodation and food service sectors (G-I), professional, scientific and technical activities and administrative and support

63 European Vacancy Monitor – http://ec.europa.eu/social/main.jsp?catId=955&langId=en.
64 European Vacancy Monitor, Issue Nr.6, April 2012. – European Commission, 2012.

service activities (M-N), as well as to real estate activities (L). The rapid technological development facilitated the rise in the demand for labour, and specifically for the employees with a higher level of education in all economic sectors. As a result of the conducted analysis it was also found that due to the rapid growth between years 2000 and 2008 in all European countries there was a high demand for labour and a high level of economic activity, although in many countries the level of employment did not reach the target indicator of 75% (established by Lisbon Strategy later replaced by the EU 2020 strategy). A higher level of economic activity and employment was seen among the European inhabitants aged 25 and more with the third level education of the first or second degree, however a lower level of employment was among the youths aged 15 to 24 in all education groups, however, in particular among the persons with pre-primary, primary or lower level secondary education where employment in none of the analysed countries reached 75%. The assessment of the participation level (economic activity) of population in various European countries lead to the conclusion that it is influenced by both the level of education as well as age: along with a greater age and acquiring more education the opportunities to find a job and, consequently, also employment, increase. However, after the age of 50 the population employment indicators have a downward trend, especially so in the groups with a lower education level. Differences in the economic activity were also observed in regional terms – the employment indicators in all age and education groups in the period of research were higher in the countries of Northern Europe and lower in Southern Europe (Greece, Italy, Portugal, and Spain) which is determined by historically developed differences as well as different education and social insurance systems. As a result of the structural changes of economy in most of the European countries an upward demand trend for various professionals and service and trade workers was observed, however, the demand for qualified workers and craftsmen was shrinking which can mainly be explained by the decreasing proportion of the manufacturing sector.

After the global economic crisis the situation in the European labour market changed considerably – in all countries the demand for labour decreased and the unemployment level grew, however, the largest fall of GDP and demand was seen in the Baltic countries and Ireland where employment decreased by more than 10%, moreover, in 2008-2010 the most significant changes were observed in the population groups with a higher level of education while the population with a lower level of education were comparatively less affected. The analysis of the unemployment level dynamics during the recession suggests that the highest unemployment level was characteristic to the population with a lower level of education and among the youth where unemployment had been high also before the crisis. During the economic crisis the structure of the demand for labour in Europe changed as well – the demand for employees in elementary occupations decreased (compared to the pre-crisis period the central value of the employment of qualified workers and craftsmen decreased from 14 to 12.6%), however, the demand for professionals grew (the central value of the employment of professionals increased from 14.8 to 15.2%); the demand for service and trade workers remaining relatively stable.

Additional information about the changes in the sectorial and skills demand in Europe as well as in individual EU member states was provided by the surveyed foreign experts[65]. In the assessment of the structural changes of the economy the experts indicated that deindustrialization has taken place – the transition of the economy from the manufacturing to the service sector. Nowadays the sectors requiring

65 Summary of interviews with foreign experts from the "Surveys in the labour market sector" of the ESF projects of the Ministry of Economics No.1 DP/1.3.1.7.0/10/IPIA/NVA/001"Development of long-term and medium-term prognosis and monitoring system for demand of labour market".

much labour, such as mining, are not topical any more, the economy is focused on services. Just a couple decades ago there was a relatively huge industrial sector – coal-mining industry, steel industry, ship building etc. The transition started in 1980s and it affected many EU countries and in different time periods also the countries which joined the European Union later, such as Poland. At the beginning the transition from the manufacturing to mining took place which continued further to the field of service provision. Along with the society ageing the demand has grown for various health and social care services. Statistics data suggest that the industrial sector (incl. mining industry) has shrunk and there has been a rise in the service sector, which in its turn has determined the employees' need for skills that would enable them to work in this economic system. A particularly dynamic development has taken place in the financial sector. Over recent 25 years financial markets have been governing the economy and manufacturing. Many traditional sectors, such as metal processing, paper and textile production or ship building have been moved to other parts of the world, mostly to the Far East and South America because Europe cannot compete with the low costs in other countries or with a cheaper labour force. The countries where a successful restructuring of information has taken place are, for example, Germany, also Austria and the Czech Republic, however, generally the EU market is not homogenous – there is a big difference between the countries of Southern Europe which are going through a distinct crisis at the moment, and Northern and Central Europe. Economic development is influenced by the debt crisis as well as a lack of strategy, particularly in Southern Europe, also Cyprus which needs the European Union assistance and has to restructure its finances. However, austerity measures alone will not facilitate renewing of economic growth, to achieve a growing economy there must also be investments. Another feature mentioned by the experts is the pre-crisis expansion of the public sector of many countries. In Europe there is an excessive administrative apparatus which appeared as a side effect of the EU construction and must be diminished. Moreover, the experts indicated that in some countries, such as Finland, Spain, Ireland and the United Kingdom an excessive reliance on the development of one branch or even one specific enterprise was seen which served as a support for a major part of the national economy and its labour market. Some experts stressed that the crisis of 2008-2009 indicated that the financial sector is the weakest and in many countries reindustrialization – the transition from the provision of financial and services to manufacturing – was taking place. Consequently, a range of traditional industries considered lost for Europe as well as agriculture has been returning. This is a positive trend as it balances various types of EU jobs. Moreover, a growing trend of the self-employed and small businesses has been observed, however, in this respect EU falls behind the United States which demonstrates much higher business activity. Successful development has been taking place in the new economic sectors, such as information and communication technologies, high technology industries, various "green economy" sectors (production of organic food, production of alternative energy sources, for example, wind turbines etc.), another part of manufacturers, however, have been successful in combining manufacturing with service provision. Besides, new industrial regions have been developing with highly qualified labour force and good universities. At the moment the European Union is focusing on the "knowledge economy", and investing in the new technology sectors which require highly qualified labour force. Better jobs are created with higher quality requirements. This kind of knowledge economy works and is effective at the moment when there is a recession in the global economy. In the future both globally and in the EU the key challenge will be to make mass manufacturing efficient and environmentally friendly, with low energy consumption. Similarly, to compete with China, India and other low-cost countries, the EU must supply high quality technological products and services to the global market.

Regarding the labour market and skills the experts point out that the overall situation is rather critical at the moment and there is a rather big difference among various countries of Europe – in the south there are countries where the unemployment level exceeds 20%. The countries which are a part of the debt crisis – Italy, Spain and Cyprus – are forced to implement radical austerity measures which have a negative effect on the labour market of these countries. Over recent 20 years many European countries, having powerful growth, paid less attention to their labour force and more to creating their fortune, profit and development. At the moment when the European economy is sluggish, the focus has again returned to the labour force and jobs. After the crisis the labour market has become more realistic – people are willing to assume the work they did not want to before, competitiveness has risen, employees have become more flexible and willing to compete globally. Generally, experts are divided regarding the EU labour market development – one of them considers that there is no single labour market in Europe, others indicate that the EU labour market was developing well until the crisis, there is still another opinion that finally the European labour market has evolved as an integrated unit. However, the majority indicate that the levelling of the economic indicators among the EU countries has not taken place – the ones which were strong, have remained strong. In the labour market the structure of the demand has changed as there has been a huge shift from a very industrially oriented to more service-oriented economy and technology-oriented economy. In some countries active involvement of cheaper labour force is taking place, however, others rely on the sufficiency of creating jobs and believe that labour force will come by them. Overall, the availability of cheap labour force is continuing to decrease in Europe. The manufacturing sites based on cheap labour force first moved to Eastern Europe and now from Eastern Europe, including Baltic countries, this business has moved to Asia. In the EU the demand for qualified labour has been increasing and the supply of educated labour has significantly increased as well. Knowledge, especially of IT, is of particular importance. Over recent years the demand has been rising for various social skills that enable successful teamwork and provide for successful relations with colleagues. There has been a significant rise in the employment of women. Similarly, there has been a rise in work flexibility – part-time or temporary employment, especially among women and youth. In some regions enterprises prefer to employ people with temporary contracts as they can be easier laid off when economy declines. In other countries affected by unemployment the trend has appeared to reduce salaries and worsen other working conditions or to offer temporary employment with lower social guarantees or even some fictitious form of employment. There are increasingly more sectors which require higher qualification and knowledge. Before it was enough with on-job training, however, now education is necessary in order to be able to work. Jobs have become much more specialized and more specific qualifications are necessary than before. The demand has risen for the medium and high level professionals and decreased for the low-qualification workers. Until the crisis there also was a high demand for low-qualified labour, a big number of migrants without any qualification arrived in Spain, Ireland, the United Kingdom and other old EU member states. Now the situation has significantly changed, the industries with a cheap final product have been moved to China and other low-cost countries. Information and communication technologies are entering all sectors and new occupations are created that are connected with the Internet, computer and digital economy. Young specialists possess better skills than the ones close to their retirement. Nowadays, the young labour force mostly has better education and knowledge than the previous generation. A kind of polarization is taking place, however, the level of knowledge is growing in all countries. In spite of that there is marked unemployment among young people, in some places it is even as big as 50%, also among highly educated young people. Some of these educated youth leave Europe to find a job. Marked discrepancy is seen between the supply and

demand for skills. There are many low-qualified people or the people who used to work in construction (e.g. in Spain) for whose skills there is no demand in the well-off industries. During the crisis the construction sector received a heavy blow in all EU member states, however, several experts indicate that as soon as the global economy recovers the construction sector will grow as this is the first sector that indicates the condition of the economy. Hi-tech industries are prospering because they have invested in human resources and they are flexible. There is a demand for specialists in engineering and green technologies, similarly, there is a lack of scientific research and researchers, e.g., in the chemical industry and other nature sciences. All over the EU specialists are needed in ICT occupations as well as engineers, technical staff in many sectors, specifically trained employees. Jobs have become more specialized and more specific qualifications than before are needed (the jobs used to be more general, with less specific knowledge). At the same time the necessity for a traditional, narrowly specialized employee producing just one object or doing one operation has decreased-. In most countries there is a lack of employees in the social care sector, doctors and nurses as well as other care staff. The demand has been increasing for special kinds of "green" knowledge. They could be very specific in a small sector, for example, the knowledge about wind turbines which is based on regular engineering education, however, with a specific concentration.

As in the European countries, the employment structure in economy has also changed in Japan – the number of employees has decreased in agriculture, fishing and forestry sectors as well as in manufacturing and construction. However, upward trends have been observed in the service sector employment – the number of employees has increased in trade, transport and communications as well as medical care fields. These trends trace back to the history of economic development since World War II as well as can be explained by the rise in the population welfare and age. At the beginning of the 21st century the employment in manufacturing was also influenced by the global financial crisis.[66] Another reason for the fall in the employment is the transferring of manufacturing to other parts of the world as well as manufacturing automatization.

Nevertheless, the forecasts suggest that until 2055 the employment will shrink to 90mln people of the Japanese labour market[67]. In 2011 the labour market of Japan featured 111 million able-bodied population in the age above 15 years. The proportion of the labour participation in the age group of 15 to 64 years was 74% in Japan. The highest participation proportion in the group cross-section with a 10-year step was in the age group between 45 and 54 years – 85%. In the division by gender groups, the biggest proportion among the employees accounts for the employed men (see fig.3.1).

66 Labour Situation in Japan and Its Analysis. General Overview 2011/2012. – http://www.jil.go.jp/english/lsj.html.
67 Ibid.

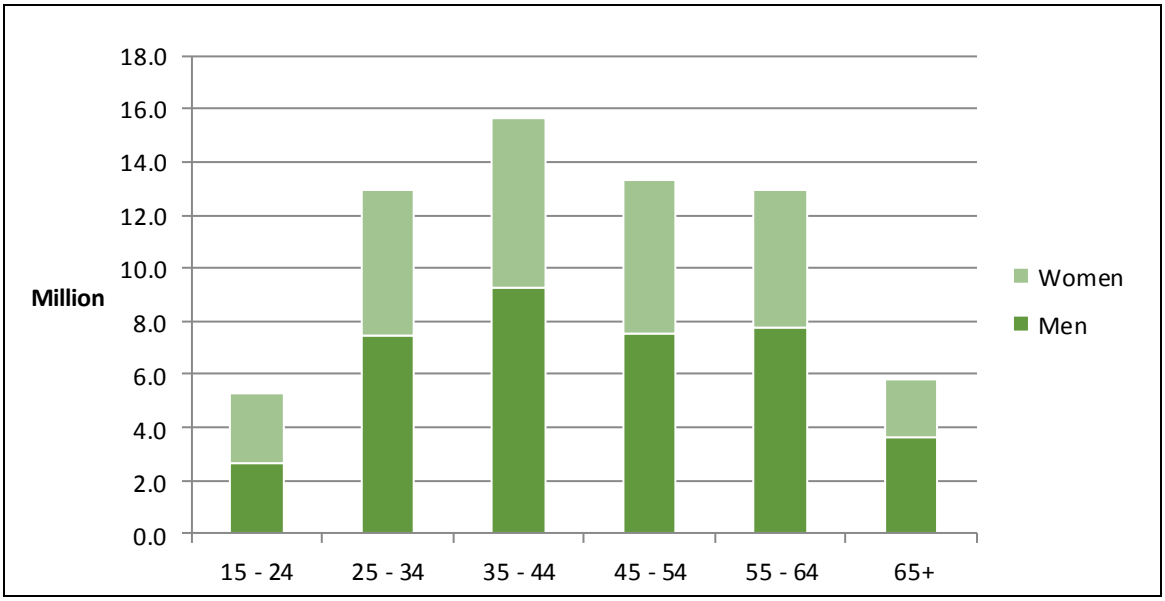

Fig. 3.1. Distribution of labour force by gender and age groups in Japan in 2011 (mln).[68]

In 2011 the level of unemployment was higher among men (5%) than women. In the division by age groups the highest level of unemployment was among the persons between 15 and 24 years of age (8%), which is explicitly seen in Fig. 3.2.

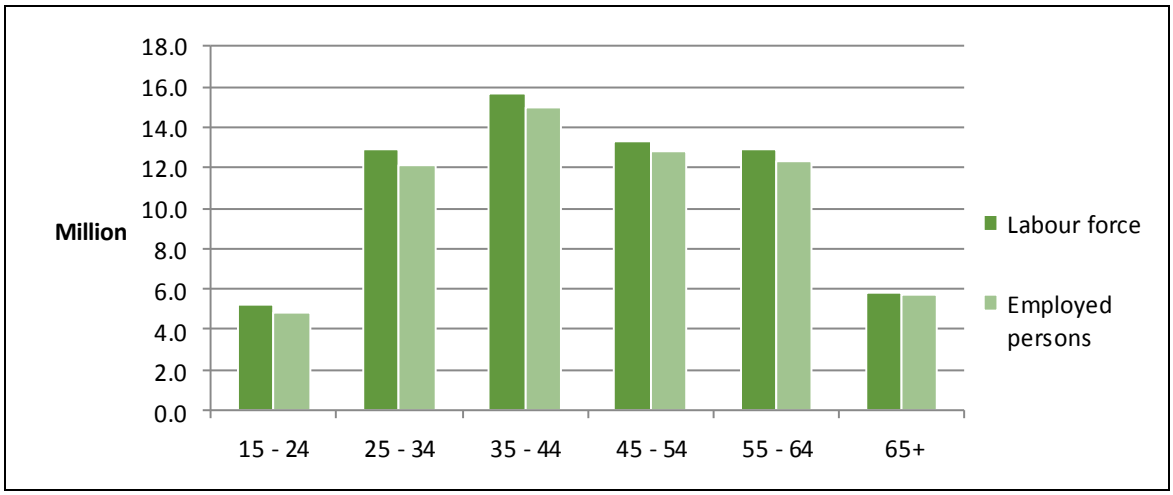

Fig. 3.2. Distribution of labour force and employed persons by age groups (mln)[69]

In a more detailed age cross-section the employment indicators show a very low participation in the labour market in the age group of 15–19 olds which can be explained by the study age of the youth. The division of the employed in smaller age groups with a step of 5 years (see fig.3.3) shows that a significant influx into the labour market takes place after finishing studies (20–24 year olds).

68 Labour Situation in Japan and Its Analysis. General Overview 2011/2012. – http://www.jil.go.jp/english/lsj.html.
69 Statistics Bureau of Japan.

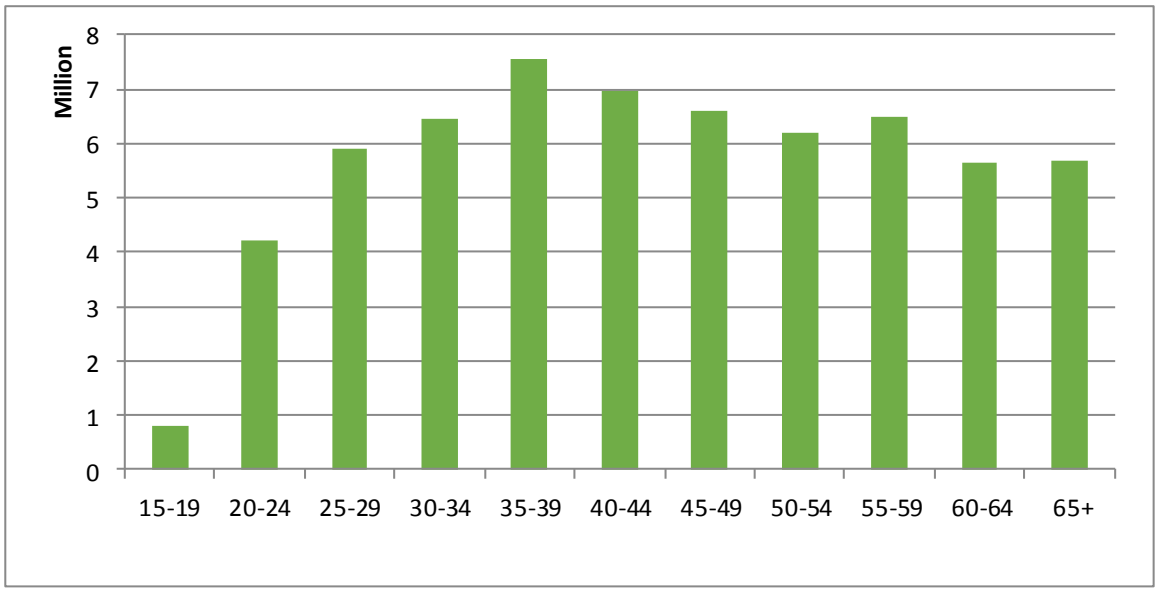

Fig. 3.3. Number of employees in Japanese economy by age group in 2011 (mln).[70]

According to the statistics data of Japan for year 2011 87% of 45 million economically inactive inhabitants did not want to engage in paid work and 60% of them were older than 65 years. However, 4% of 4.6 million economically inactive inhabitants who had demonstrated the willingness to work, had indicated an insufficient level of skills for assuming the work, while 13 % had indicated poor health condition.

The data on occupied jobs suggests that the biggest number of the employed persons were concentrated in the trade and processing industry followed by the medical care sector the third biggest number of employees (see fig. 3.4.).

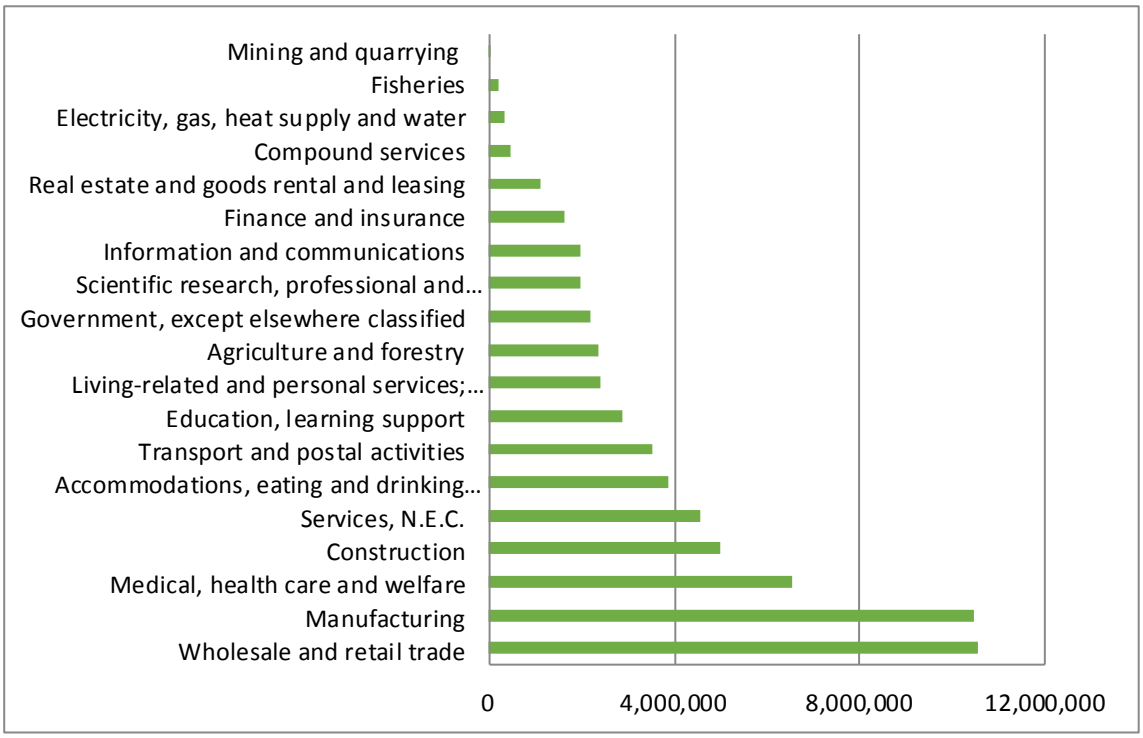

Fig. 3.4. Employed persons by industry in Japan (mln)[71]

70 Statistics Bureau of Japan.

In the division by occupational groups the biggest number of the employed are concentrated in the provision for the industrial process – in the processing industry, construction and service sectors – clerks and technical staff (see table 3.1.).

As a result of the assessment of the distribution of the employed persons by age groups with the step of 10 years it can be concluded that in some occupations there is a marked increase in older age groups: in the agriculture and forestry sector the persons employed in the age bracket 15–39 years are 310 thousand, however, the ones past 40 years account for 2.16 million (see Appendix 8). Similar trends can be seen regarding the number of the persons employed and age groups in transport and postal activities as well as regarding managers and clerks. The trends can be explained by the fact that clerks and managers' occupational duties comprise the skills that can be acquired during their work, such as organizational, management and administration as well as problem-solving etc. skills. However, the ageing of the persons employed in agriculture and transport could be explained by the structural economic changes and young people's career choices nowadays.

Table 3.1. Distribution of employed by occupational groups in Japan in 2010[72]

		Number of the employed (mln)	Proportion of the employed (% of the total employed)
Professionals and technical specialists		9.86	15.8
	Technical professionals	2.51	4.0
	Education professionals	1.53	2.4
	Other professionals and technical staff	5.82	9.3
Managers and clerks		1.61	2.6
Civil servants and similar specialists		12.84	20.5
Clerks		8.56	13.7
Social care specialists		8.17	13.1
	Family support centre specialists	0.35	0.6
	Security and defence specialists	1.23	2.0
	Others	6.59	10.5
Agriculture, forestry and fishing specialists		2.47	3.9
Transport and postal services specialists		1.99	3.2
Manufacturing workers		16.51	26.4
	Diggers	0.02	0.0
	Manufacturing and construction workers	12.78	20.4
	Workers	3.71	5.9
Undivided		0.57	0.9
Total		**62.57**	**100.0**

In the future the economic development of Japan will become increasingly more oriented towards foreign markets which will promote the aggravation of the global competition and diminishing of the role of the domestic demand. Similarly, in the development of Japan the ageing trends of the Japanese population

71 Statistics Bureau of Japan.

72 Okamura A., Onuma K., Takehana K. Direction for Japan's Strategy for economic growth towards 2030. – Nomura Research Institute, NRI Papers No.159, November 1, 2010
http://www.nri.co.jp/english/opinion/papers/2010/pdf/np2010159.pdf.

will be very significant[73]. In order to stand the pressure on the living standard that might be created by the population ageing there is a need for raising productivity. However, to achieve economic growth in Japan, new industries are needed as well as acquisition of new markets and raising productivity.

In the **USA**, unlike Europe and Japan, where a fall in the number of population is expected in the nearest decades and a marked ageing of the population is reported, the total number of inhabitants will rise by 313.9 million in 2012 to 351.4mln in 2025. Nevertheless, disregarding the positive natural population increase, changes in the age structure are expected as well as the rise in the number of people past 65 years in the USA. This is suggested by the trends from the previous decade presented in Fig. 3.5.

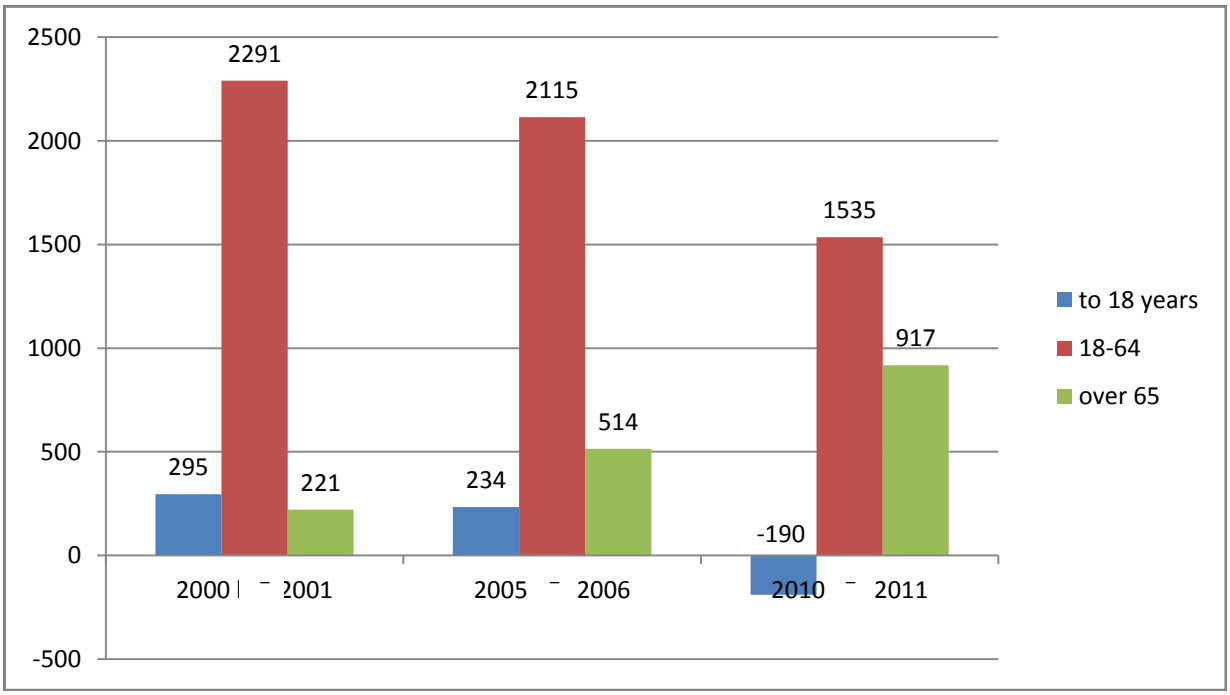

Fig. 3.5. Changes in the population number in USA (thousand) in various age groups between 2000 and 2011.[74]

As it can be seen in the figure above, over the recent decade the USA have experienced a pronounced downward year by year trend in the number of population under 18 years of age and upward trend in the number of population above 65 years. Between 2010 and 2011 the number of population below 18 years decreased by 190 thousand, although prior to it a moderate rise in the number of population under 18 years had been observed. In the future it can create a negative impact on the labour market and lack of labour. Until the recession the employment level (in the age group of 20–64 years) in the USA was in average 68% and exceeded the average indicators of both Japan and EU-27[75]. Since 2009 the employment level has dropped and accounts for about 65%. A rise in unemployment can be seen affecting both the persons working in manufacturing as well as service industries. According to the data of the US Labour Statistics Bureau, this will particularly heavily affect the sectors facing competition from the Asian countries. These sectors include textile industry and leather processing where the reduction is

73 Okamura A., Onuma K., Takehana K. Direction for Japan's Strategy for economic growth towards 2030. – Nomura Research Institute, NRI Papers No.159, November 1, 2010
http://www.nri.co.jp/english/opinion/papers/2010/pdf/np2010159.pdf.
74 2012 World Population Data Sheet, Population Reference Bureau, 2012.
75 Eurostat database.

determined by the drop in the demand for cars and furniture in the USA. Likewise, in some sectors the reduction of employment has been observed due to technological changes (for example, regarding the production of various telephone wires and cable connections, postal services, stationary computer sales and repairs etc.).

The summary of the recent changes in the demand for skills and their determinant factors **abroad** allows concluding the following:

- The determinant factor influencing the demand for labour in Europe is the sector structure of economy and over the recent decade the changes in the structure have led to the reduction in the demand for labour in such sectors as agriculture, fishing and forestry (A), as well as manufacturing (B–E), however, the demand has risen for specialists in various service sectors;
- The shifts in the demand for labour in Europe have been influenced by the rapid development of technologies which facilitated the growth of the demand for the employees with a higher education level in all sectors of national economy;
- In the EU the demand is increasing for qualified labour, jobs have become much more specialized than before and require more specific employee qualifications. The demand has risen for the middle and higher level professionals and dropped for lower qualified workers;
- The shifts in the demand for labour in Europe have been determined by the global economic crisis resulting in the reduction of the demand for labour in all European countries, in particular in the Baltic countries and Ireland. After the crisis the labour market has become more realistic, people are willing to assume the work they did not accept before, competitiveness has risen and employees have become more flexible and ready to compete globally;
- As a result of the crisis there was a shift in the demand structure for labour – the demand decreased for elementary occupations and increased for professionals. All over the EU specialists of ICT are required as well as engineers, technical staff in many sectors and specifically trained employees. In most countries there is a lack of employees in the health and social care sector – both doctors and nurses as well as other care staff;
- As in Europe, the employment structure has changed also in the economy of Japan with the reduction of employment in agriculture, fishing, forestry and construction sectors;
- The biggest number of employees by occupational groups in Japan is concentrated in the provision for the manufacturing process – in the processing industry and construction sector as well as in the provision of services – clerks, civil servants and technical staff;
- Compared to Europe and Japan, in the USA the employment and age structure of population is better, however, in the USA the number of population below 18 years of age is decreasing there as well which may create a lack of labour in the future;
- In the USA, like in Japan and Europe, structural changes in the labour market can be observed – the demand for labour in the processing industry is decreasing, this particularly concerns the sectors the produce of which does not stand the competition with the goods imported from Asia as well as in the sectors where rapid technological changes can be observed.

3.2. COMPARATIVE ANALYSIS AND DIFFERENCES OF SKILLS' DEMAND IN LATVIA AND ABROAD

The **key factors determining the differences** in the demand for skills:

1. economic growth rate (GDP growth);
2. sector structure of economy;
3. level of productivity.

In the period between year 2000 and 2008 the economy growth rate in Latvia was in average 3.5 times faster than in the EU-15 countries, especially so after the accession of Latvia to the EU (four years before the accession to the EU the GDP of Latvia was increasing by average 7% per year, however in years 2004 – 2007 it increased in average by 10.4% per year and by 36.5% over the whole period. This also determined the increase in the demand for labour and rise of employment (the level of employment in the age group 15-64 rose from 57.5% in year 2000 to 68.6% in 2008). However, it must be taken into account that before year 2000 the employment level in Latvia was considerably lower than in the EU-15 countries which determined more rapid dynamics of employment growth in Latvia compared other European countries (from year 2000 to 2008 the employment level in the EU-15 countries grew from 63.4%. to 67.1%[76]).

The comparison of the change trends in the economic structure of Latvia (see table 2.3) with the economic development and demand for labour trends in other European countries (see table 3.2) suggests that in years 2000 to 2010 in all countries of the EU as well as Norway the proportion of agriculture, fishing and forestry sector (A) in the economy decreased. This is particularly characteristic to the new EU member states where the initial proportion of this sector was significantly higher than in the EU-15 average. At the end of 2010 in Latvia the level had returned to that of 2010 and accounted for 4.5% of GDP which is the second highest indicator among the analysed countries and exceeds the average level of the EU-15 3 times. This determined the decrease of the demand for qualified agriculture and fishing workers in most of European countries and particularly in the countries where the agriculture sector had a bigger weight (Poland, Greece, Lithuania and Bulgaria). Moreover, the proportion of the persons employed in the agriculture, forestry and fishing sector (A) in Europe varies considerably. This is influenced by both the climate conditions as well as various levels of productivity and application of technologies. Thus in Portugal, although the proportion of the sector in the country's GDP in 2000-2010 accounted for just over 2%, more than 10% of all economically active inhabitants were employed in the sector. In Bulgaria, however, the sector also accounted for a high proportion of GDP (above 5%), but just 4% of all economically active persons worked there.

[76] Eurostat database.

Table 3.2. Development trends of economic sectors and determinant factors in the EU countries in 2000–2010

SECTOR	TRENDS (proportion in economy)	DETERMINANT FACTORS
A – Agriculture, forestry and fishing	Downward	Technological development, EU Agricultural policy, EU financial support, climate, migration, global markets (changes in the demand and orientation)
B–E – Manufacturing, electricity supply	Downward	Technological development, Foreign supply, Structural changes of the demand, rise in the labour costs, manufacturing capitalization, EU policy, alternative energy and renewable resources
F – Construction	Upward	Shifts in the demand, availability of financial resources, shifts in the demand structure, migration, changes in technologies and construction methods, price of resources
G, I – Trade, accommodation and food services	Downward	Tourism, radical changes in the demand, decrease of the demand and rise of the quality demanded, change of habits
H, J – Transport, storage, information and communication services	Constant	Oil prices in global markets, crises in subsectors, technological development, change of generations, expansion of availability, legal viewpoints and limitations
K–N – Financial, insurance, scientific research, administrative services; operations with real estate	Upward	Changes in financial markets, reduction of operational costs, banking strategies, financial sector saturation, availability of financial resources, non-resident deposits, EU and member state policy
O–Q – Public administration and defence; compulsory social insurance, education, health and social care	Upward	EU enlargement, structural reforms, overall economic development, administration of the EU support funds, demographic situation, education and health care system reforms, international competition, society ageing, living standard of the population

According to the analysis of the trends in the industries of the manufacturing sector (B–E) Latvia belongs to the group of the countries where in 2010 the proportion of the industrial and other manufacturing sectors was approximately the same as in year 2000. Moreover, in Latvia the indicator was even slightly higher that the EU–15 average. The analysis of the data suggests that in the Nordic countries – Norway, Sweden, Finland, Denmark the proportion of these industries in GDP decreased between year 2000 and 2010, however in Central Europe – Germany, Netherlands, the Czech Republic, Hungary, Slovakia and Poland – it remained constant. Regarding the change trends of this indicator Latvia, Lithuania and Estonia are closer to the Central European than Nordic countries. Moreover, in Latvia the proportion of these industries in GDP is the lowest compared to other Baltic region countries.

The analysis of individual service sector industries led to the conclusion that generally these industries do not tend to decrease in Europe and in most countries their proportion has remained constant. When examining the EU-15 countries separately it was found that since year 2000 the most significant proportional growth in GDP terms had taken place in the financial and insurance operations, real estate operations, public administration and defence, compulsory social insurance, education, health and social care. However, in period 2000 – 2010 the biggest proportional decrease in the EU-15 countries was observed in such industries as wholesale and retail, transport, accommodation and food services. In Latvia, though, the GDP proportion of these industries had had an upward trend since year 2000 which led to the increasing of employment proportion in the occupational group "Service workers and shop and market sales workers". Since year 2000 the biggest proportion decrease in the GDP of Latvia has been observed in ICT services, public administration and defence, compulsory social insurance, education, health and social care sectors which were largely influenced by the government austerity measures implemented due to the financial crisis and affecting namely the public administration and social sector.

Although in some EU member states the economic structure and proportion of service industries in GDP varies significantly (see Appendix 4), in most of the European countries the upward trend in the proportion of finance and insurance operations has been observed since year 2000, a decrease of the sector proportion has been reported only in Finland, Estonia, Sweden, Greece, Poland and Austria. The finance and insurance industry is closely connected with the development of the "operations with real estate" as mortgages occupy a significant place in the loan portfolio of banks. The biggest proportion of the "operations with real estate" in GDP is in the Southern countries of Europe – Italy, France and Greece which can be explained by the development of tourism in the region. Since year 2000 these countries have also demonstrated the growth of the proportion of real estate operations in GDP. However, in Bulgaria, Estonia and Slovakia the fall in the proportion of the industry was seen in 2010 compared to year 2000. In Latvia and Lithuania the proportion of the real estate operations has not significantly changed (in Latvia it has slightly increased and in Lithuania – slightly decreased) and lies considerably below the EU-15 average which suggests that this sector possesses a significant potential for the future growth. Similarly, all over Europe positive trends are seen in the development of professional, scientific research and technical services as well as administrative and service sectors (M-N). Since year 2000 in all analysed European countries the proportion of these sectors has increased. The highest proportion of professional, scientific research and technical services as well as administrative and service sectors in GDP is in Belgium, France and the Netherlands where many EU institutions are located. Similarly, the proportion of these sectors is relatively high in the United Kingdom and Germany. In the new EU member states the proportion of these sectors is significantly lower, which particularly concerns Bulgaria, Slovakia and Lithuania. Moreover, for the development of these sectors various professionals are needed who are able to solve abstract tasks; consequently, since year 2000 the demand for all kinds of professionals has increased in almost all countries, but particularly in Belgium, the Netherlands and Sweden where there was a relatively fast rise in the demand for professionals (group OC2), however, in the Czech Republic, Austria, Norway and Denmark there was a faster rise in the demand for other professionals (OC3 group).

Another characteristic trend observed in European countries was the reduction in the demand for clerks (group OC4). In almost all European countries, except Bulgaria, Hungary, Estonia and Latvia the proportion of the clerk's group employment has decreased since year 2000. The analysis of the elementary occupations (group OC9) did not lead to unanimous conclusions about the changes in the

demand trends because there are countries where the demand for elementary occupations has rapidly increased since year 2000, for example, Cyprus, Greece, Bulgaria, which can be explained by a comparatively high demand for various elementary occupations in tourism and agriculture. Besides, there were countries where the demand for these occupations as fast declined. This is confirmed by the changes in the proportional division of occupations in the EU-15 countries since year 1995 (see fig.3.6).

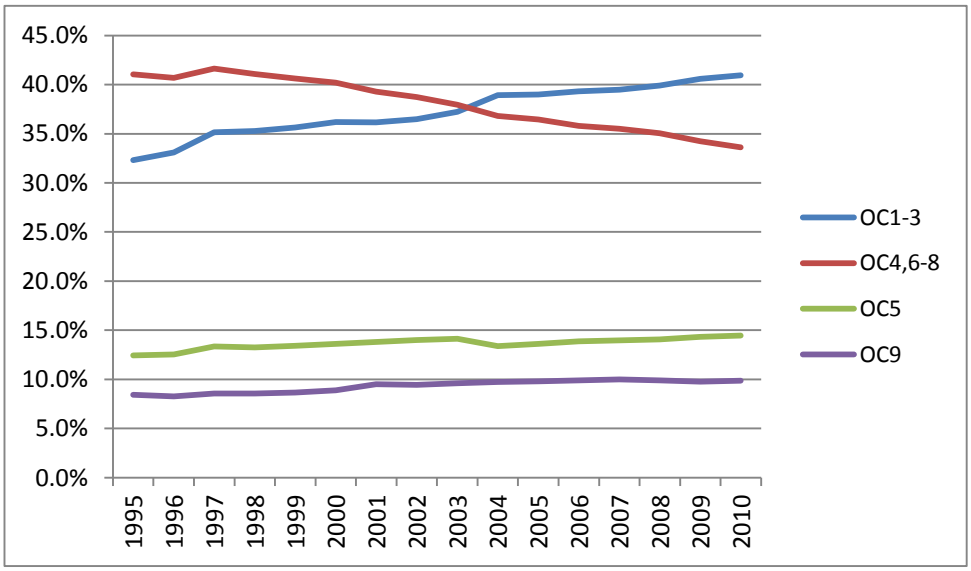

Fig. 3.6. Distribution of the occupation proportions in the EU_15 countries[77]

As it can be seen from the figure above, the proportion of clerks (group OC4) as well as the demand for qualified specialists in various sectors (groups OC 6-8) have been decreasing since 1990s in the EU-15 countries. This can mainly be explained by the development of technologies which leads to a lower demand for routine jobs (which can be easily automatized). At the same time the demand for various professionals has been growing. This was also indicated by the surveyed foreign experts who particularly pointed out the lack of employees in the following groups:

1. specialists, engineers in green technologies, IT and science sector;
2. health care employees, highly qualified doctors, employees in specific medical occupations;
3. senior level professionals and qualified employees;
4. managers, especially in the middle level, who are able to adopt decisions and manage;
5. craftsmen, painters, carpenters, plumbers, cooks, hotel staff.

The lack of employees is explained by the inability of education to develop at same rate with the economy- the labour market has changed until a person finishes his education. In some remote regions it is difficult to attract workers due to the lack of infrastructure.

The excess of labour, however, is observed in the following occupational groups:

1. lower level employees in the elementary occupations;
2. administrative employees in various EU institutions;

77 Figure designed by the authors on the Eurostat database.

3. specialists in many traditional manufacturing industries which have been transferred to another country or have naturally ceased to exist, in some countries also agriculture specialists;
4. As a result of the crisis – in the financial services sector, however the sector has to be used as a competitiveness potential for Europe where there are advantages and huge knowledge;
5. In the construction sector of many countries.

According to the experts, the reasons for the discrepancy between the demand and supply of labour lie in the fact that people do acquire tertiary education, however they study such courses as history, linguistics or art and they do not acquire the specific qualification required by the labour market. Previously the acquired education did not matter – it was possible to get a job without a specific qualification. Still another negative trend that has appeared after the recession is that many students give up their studies for the work in elementary occupations which will later create problems.

The summary of the trends in the demand for skills prevailing in Europe is shown in table 3.3. Along with the assessment of the determinant factors of the demand for skills the authors also determined the kind of their influence (direct or indirect) as well as size of influence (significant or insignificant).

Table 3.3. Trends in skills' demand for prevailing in the EU labour market in years 1995–2010, their influencing factors, kind and size of influence

CODE OF OCCUPATIONAL GROUP	OCCUPATIONAL GROUP	TRENDS	INFLUENCING FACTORS	KIND OF INFLUENCE	SIZE OF INFLUENCE
OC–1	Legislators, senior officials and managers	Upward	EU administration and control policy	Direct	Significant
OC–2	Professionals	Upward	Development of technology and knowledge–based industries	Direct	Significant
OC–3	Technicians and associate professionals	Upward	Development of technology and knowledge–based industries Education system and curricula	Direct Indirect	Significant Significant
OC–4	Clerks	Downward	Automatization of services Reorganization policy of state institutions	Direct Direct	Insignificant Significant
OC–5	Service workers and shop and market sales workers	Upward	Decrease in the proportion of the service sector in the economic structure	Direct	Significant
OC–6	Skilled agricultural and fishery workers	Downward	EU Agricultural policy Technological progress (Replacing of qualified employees with technologies)	Indirect Direct	Insignificant Significant
OC–7	Craft and related trades workers	Downward	Technological progress (Replacing of qualified employees with technologies)	Direct	Significant
OC–8	Plant and machine operators and assemblers	Constant	Manufacturing Automatization Structural changes in the global economy	Direct Indirect	Significant Significant
OC–9	Elementary occupations	Upward	Technological progress (the demand for the fundamental skills for elementary operations)	Direct	Significant

While analysing the demand for skills in the cross-section of individual industries considerable differences were observed in various European countries. For example, in Latvia the data regarding ICT, finance and insurance, professional, as well as administrative and service sectors, scientific research and technical services are indicated solely and only in the cross-section of the professionals' group OC-3, however, in other countries other occupational groups also work in the sector. Thus the trends in the demand for skills by individual occupational groups and sectors are to be assessed with caution and it is not possible to present scientifically substantiated arguments about skills dynamics in various countries based on the statistics data due to the quality of the data – in each country there might be specific classification and recording nuances. In order to establish the reasons for the differences a much more fundamental analysis is needed which is currently restricted by the quality of the available data (insufficiency and discrepancy of the data as well as the differences in data recording and classification of occupations).

After comparing the demand for skills in Latvia, Europe and other countries of the world it can be concluded that:

- Since year 2000 in Europe and other countries of the world the demand has been rising for the professionals of various levels (in OC1-3 occupational groups) which are mainly connected with the structural changes in the economy (development of various service industries and rise in their proportion).
- In Latvia the demand for the professionals of various levels (in OC1-3 occupational groups) has been slightly different from the average trend of the European Community countries as well as from the trends in Denmark, Finland and Sweden (where it has been much higher) – it has been closer to the trends in Italy and Austria (both in terms of the employment as well as changes).
- In all European countries the demand has been decreasing for clerks (OC4) and qualified workers (groups OC6,7,8), which is due to the decreasing of the proportion of the manufacturing sector in the economy as well as with the technological process as a result of which many simple, routine jobs are replaced with machine work – automatized. This has also been facilitated by the economic crisis which has resulted in the excess of workers in the construction and other sectors.
- The demand trends for the clerks and qualified workers (groups OC4,6,7,8) in Latvia have been similar to other European countries, however, the demand per 1000 employees is higher in Latvia than in Denmark, Finland and Sweden and corresponds more to the level of Italy and Austria.
- In Europe, as in the world as a whole, the demand is rising for the employees in the service and trade sectors (OC5 occupational group). This can be explained by the dynamic development and growth of the service sector industries over recent twenty years.
- In Latvia the demand for workers in service provision and trade (group OC5) has been fluctuating, however all together the demand for the specialists of this field has been growing similarly to other European countries.
- In Europe, unlike the globally observed trend of the growing demand for elementary occupations (OC9), the trend is not so explicit, although no downward trend has been observed either, according to the surveyed foreign experts.

- In Latvia the demand for elementary occupations (OC9) corresponds to the general trend in the European countries, however, it is higher that the EC average and more corresponds to the demand trends in Southern Europe (Spain and Portugal).
- Over the recent twenty years the changes in the demand for labour in Latvia as well as other European countries, USA and Japan were determined by the fluctuations caused by economic cycles (GDP growth rate), economic structural changes in the industry cross-section as well as the development of technologies and the growth of competition from the development (especially Asian) countries.

4. ALTERNATIVES FOR LONG-TERM ECONOMIC DEVELOPMENT OF LATVIA AND POTENTIAL SCENARIOS IN THE FUTURE

4.1. SCENARIOS FOR ECONOMIC DEVELOPMENT

The designing of the economic development scenarios of Latvia can be characterized by the efforts to identify the main determinant factors (both internal and external) which would allow (or interfere with) achieving the aim set forth for the economy of Latvia: over a historically short time (until year 2030) to create for Latvia as a European Union member state a competitive economy in the global environment and to provide for the living environment and quality attractive for the population. When determining the factors influencing the economy the authors took into account and analysed both the development trends and scenarios of the global economy, the expected growth of the EU countries and the strength of their mutual co-operation as well as the comparative advantages of Latvia as an EU member state and other factors (see fig. 4.1).

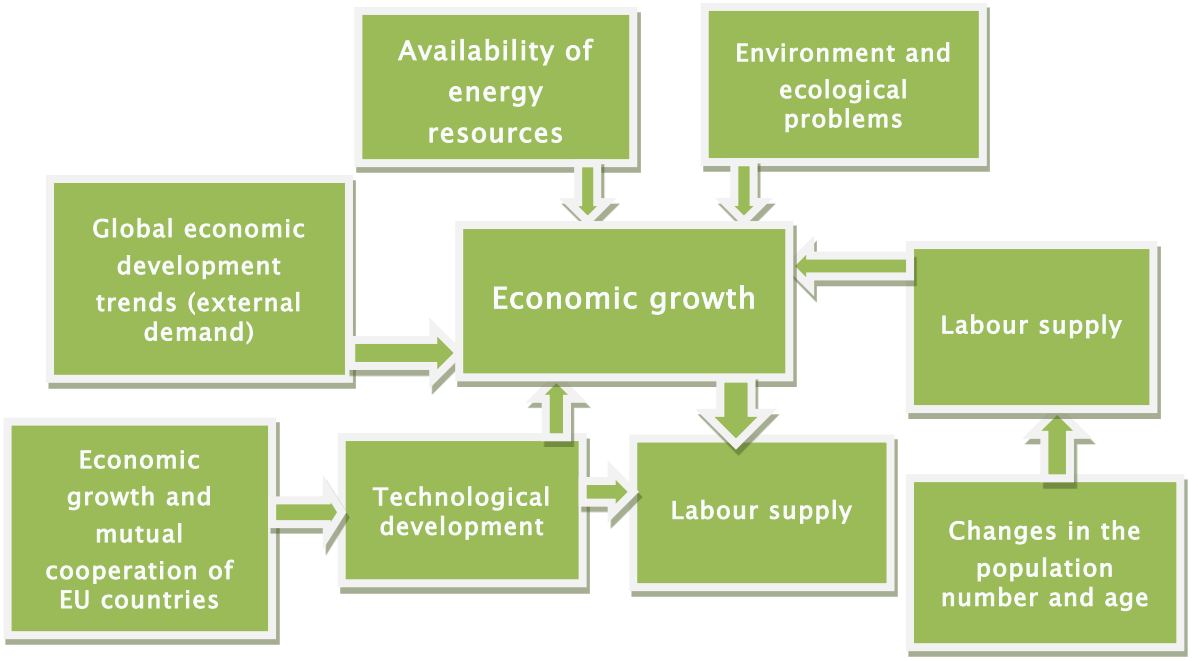

Fig. 4.1. Factors influencing the economy of Latvia and their interaction[78]

This allowed establishing the economic development evaluations for a longer term and outlining the possible future development alternatives as well as the associated gains and losses. The designing of the alternatives and scenarios for the economic development of Latvia took place in several **stages**:

1. The programming documents of the EU and Latvia determining the long-term development[79] were examined as well as the directions of the economic policy outlined in them;

78 Figure designed by the authors.

79 "Europe 2020" A strategy for smart, sustainable and inclusive growth, European Commission, Brussels, 3.3.2010; National reform programme of Latvia for the implementation of strategy "EU 2020", Riga, April, 2011; Sustainable development strategy of Latvia "Latvia 2030", Saeima of Republic of Latvia, 2010; Strategic Development Plan of Latvia for years 2010-2013, approved by the Cabinet of Ministers Order no.203 of 9 April, 2010.

2. The scenario matrix with four alternative development scenarios was created;
3. 3 different GDP growth projections were elaborated that correspond to various development scenarios;
4. As a result of cluster analysis the benchmark group of countries was established that corresponds to each scenario;
5. The favoured (or optimal) structure of the economy of Latvia in 2030 was created;
6. Based on different GDP growth projections, previous experience of the benchmark countries and favoured structure of the economy, the current employment distribution in Latvia by sectors and occupational groups was evaluated and the analysis of the future demand for skills in Latvia by sector was made (see fig. 4.2).

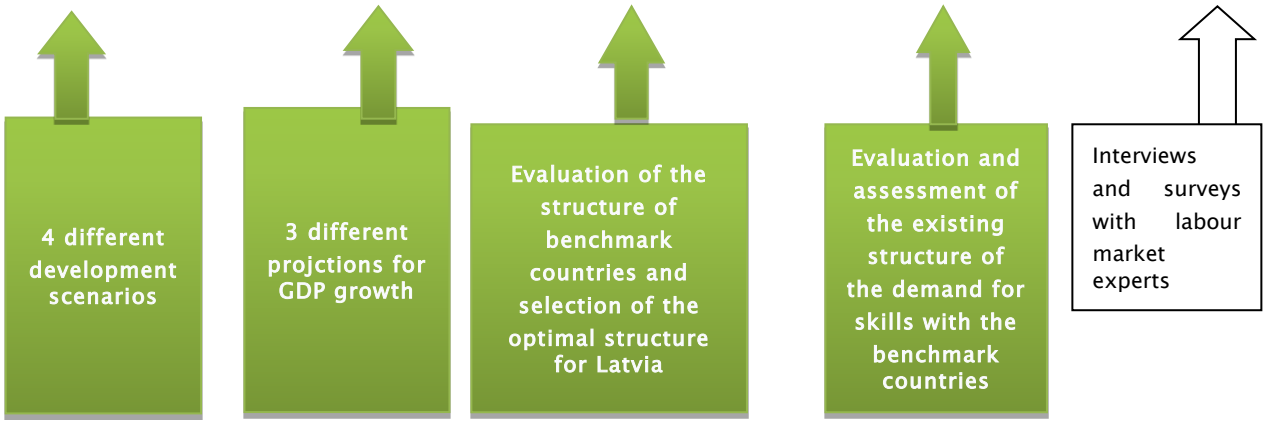

Fig. 4.2. Designing process of labour forecasts and its stages[80]

The decisive role in determining the demand for the future skills belonged to the assumptions about the restructuration of the economy to the production of goods and services with a higher added value and close mutual co-operation among the EU countries which served as a basis for the scenario matrix with four alternative development scenarios. As a result of the assessment of the alternative scenarios three different GDP growth projections were designed (by excluding the pessimistic scenario which would mean the deterioration of the economic situation in Latvia) and with the help of the cluster analysis the countries were grouped by the proportion of the economic sectors in the added value, then the benchmark countries were established corresponding to each GDP projection. The previous experience of the benchmark countries was analysed further for designing the forecasts for the demand for skills by sectors and occupational groups in Latvia.

In the **first stage** of the scenario design which consisted of the assessment of the policy documents and development strategies of the EU and Latvia as well as the economic development directions envisaged there it was concluded that the further development of Latvia to a large extent depends on the global economic development as well as the processes taking place in the EU. Consequently, in the assessment of the economic development alternatives for Latvia the assumptions were made that 1) no global catastrophes and political disturbances take place in the world that would essentially influence the development of civilization and the geopolitical situation in the European region remains constant; 2) the

[80] Figure designed by the authors.

European Union continuous to exist in accordance with its currently defined development and enlargement processes, a planned and systematic shift of economic paradigms and movement towards sustainable development is taking place, however over the time a certain modification and evolution in the paradigms is possible; 3) Latvia is and remains an EU member state and actively integrates in the process of its improvement; 4) natural and social processes are influenced by the time factor, many development aspects are influenced by the uncertainty of the on-going processes.

In the second stage, by using the scenario approach four alternative economic development scenarios were elaborated for Latvia. The scenario development approach has been widely used in the world for more than 40 years. It was created by *Herman Khan*, who in 1967 presented several future development scenarios of the world for the case if a nuclear war broke out.[81]. In 1970s and 80s Khan's ideas were developed further by the strategists of the corporation *Royal Dutch/Shell headed by* Pierre Wack. Nowadays the scenario approach is widely used not just in the business world, but also for designing strategies for cities, countries and international organizations. Thus the vision on the future of Russia "Russia and the World: Scenarios to 2025" (2006) designed by the global Economic Forum was created based on this approach; it has also been used for designing the development strategy of Estonia "Growth Vision 2018" (2010) and assessment of the long-term development alternatives of the countries in the Baltic region ("Four Futures Central Baltic sea Region 2050" (2010)). There several kinds of scenarios are distinguished – the scenarios aimed at a specific goal (e.g., the ways to overcome our key competitor). Crisis scenarios and the scenarios focusing on research and consensus used when assessing, for example, the future development opportunities of a country (K.van der Heijden[82]). Compared to forecasting, where it is assumed that the future is already relatively certain and what remains is to adjust to it possibly better, the scenario approach stresses the uncertainty of the future and allows for the freedom of creating several possible futures[83]. The aim of the scenarios is not to forecast what something will be like, but rather to outline the limits of the future development. The scenarios are built by analysing the regularities of the social, political, economic and environmental processes. This is why the scenario approach cannot be considered the modelling of the most likely development in a certain historic period by observing the political, economic and social processes in the respective country and the world as a whole. However, the scenario approach allows creating the possible development alternatives of events if one or another group of influencing factors (political and social environment, scientific and technological development, demographic development and economic pre-conditions) come true and thus outline the possible development routes and their consequences which are reflected in the economic structure, physical welfare of the society and its quality of life. The scenario approach allows for better understanding of the long-term consequences of certain political, economic and social decisions that have been adopted. Another as important advantage of the scenario method is that the formulation of several rather than just one viewpoint serves as a basis for discussion about the favoured and possible development and creates a platform on which the social consensus on a common future vision can be built.

When designing the set of scenarios for assessing the economic development alternatives of Latvia the method of the favoured and unfavoured scenarios was used initially outlining the pessimistic and

81 Khan, Herman, The Year 2,000: A Framework for Speculation on the Next 33 Years, Macmillan, 1967.
82 Kees van der Heijden, Scenarios: The Art of Strategic Conversation, John Wiley& Sons Ltd, England, 2005.
83 Tibbs, Hardin, „Making the Future Visible: Psychology, Scenarios, and Strategy", Global Business Network March 2000.

optimistic future development and developing the real vision as a combination of the pessimistic and optimistic future development. A significant advantage of this scenario method is the formulation of several, rather than one, future visions which develops a platform for building a specific forecast about the overall economic growth and modelling the development dynamics of certain economic sectors (according to the assumptions of each scenario). To design the set of scenarios two main development axis or critical choices were initially identified which will be pivotal in the future vision of Latvia:

1) Horizontal (external factor determined) axis, which reflects the further development of the EU and strength of the mutual integration of the EU countries (the ability or disability to cope successfully with the challenges the European Union will face in the nearest two decades);

2) Vertical axis (internal factor determined) reflects the structure of the economy of Latvia and the improvement and balance of the labour market (connected with the structural changes in the Latvian economy aimed at higher added value sectors and a significant rise of labour efficiency). Based on these two assumptions four alternative development scenarios (scenario matrix) were created outlining a different development model of Latvian economy (see fig.4.3).

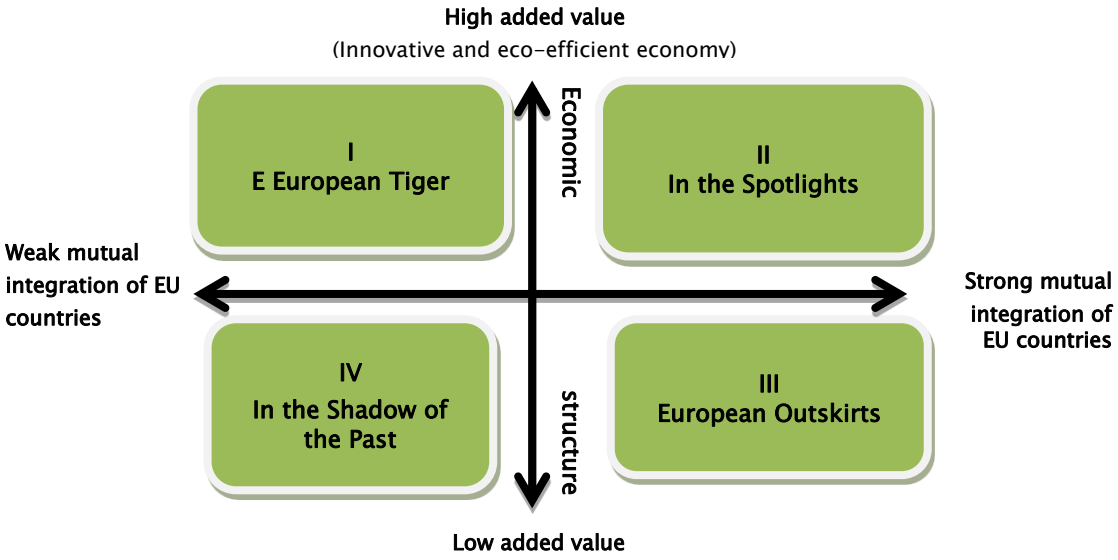

Fig. 4.3. Future economic development scenarios for Latvia (scenario matrix)[84]

As it can be seen in Fig. 4.3., four alternative development scenarios characterized by the corresponding segments of the scenario matrix are possible:

I. E-European Tiger (efficient and innovative economy with a weak mutual cooperation among the EU countries);
II. In the spotlights (dynamic and rapidly growing economy which is based on a close mutual co-operation among the EU countries);
III. European outskirts (economy focused on the mutual co-operation among the EU countries with the "traditional", local resources-based industry structure);

84 Figure designed by the authors.

IV. In the shadow of the past (a slowly growing economy, oriented at the regional co-operation and internal market).

The authors of the research also evaluated the positive and negative aspects in each of the development cases which are presented in Fig. 4.4. and 4.5. below.

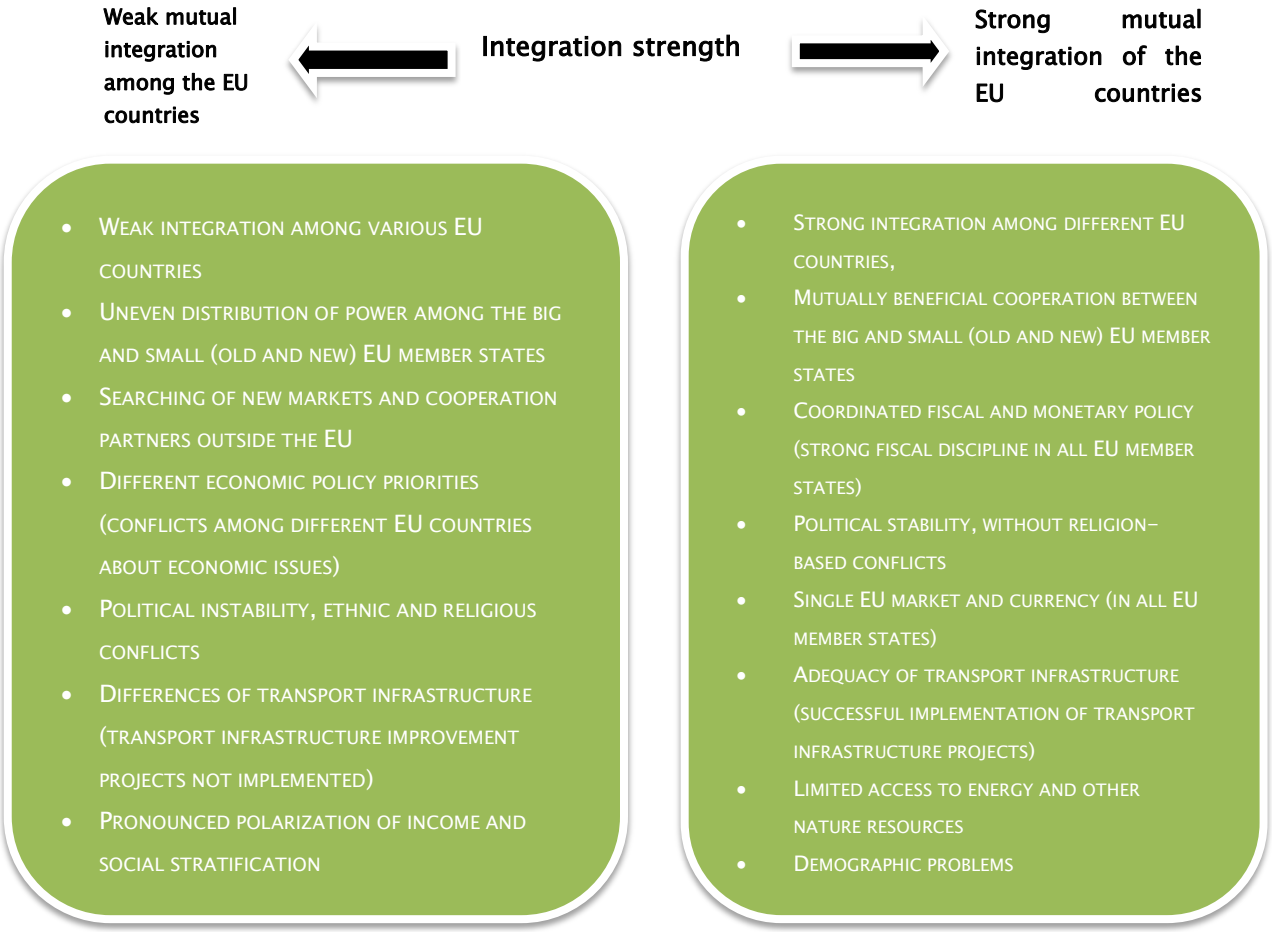

Fig. 4.4. Possible positive and negative economic development aspects depending on the strength of the EU integration[85]

Under weak EU integration the trend may strengthen to form various, different in development terms, blocks of countries. It will also be facilitated by the EU enlargement and attraction of new member states. Latvian economy experts indicated that such blocks have already been developing:

- One of the blocks – Germany, France and, in some issues, the United Kingdom as strong former metropolises. Sometimes, to increase the weight of the block, is joined by Poland;
- The block of the North European countries which also comprises the Baltic countries which are necessary to increase the weight;

85 Figure designed by the authors.

- The block of the South European countries – Spain, Italy, Portugal, which are currently facing similar problems due to economic considerations[86].

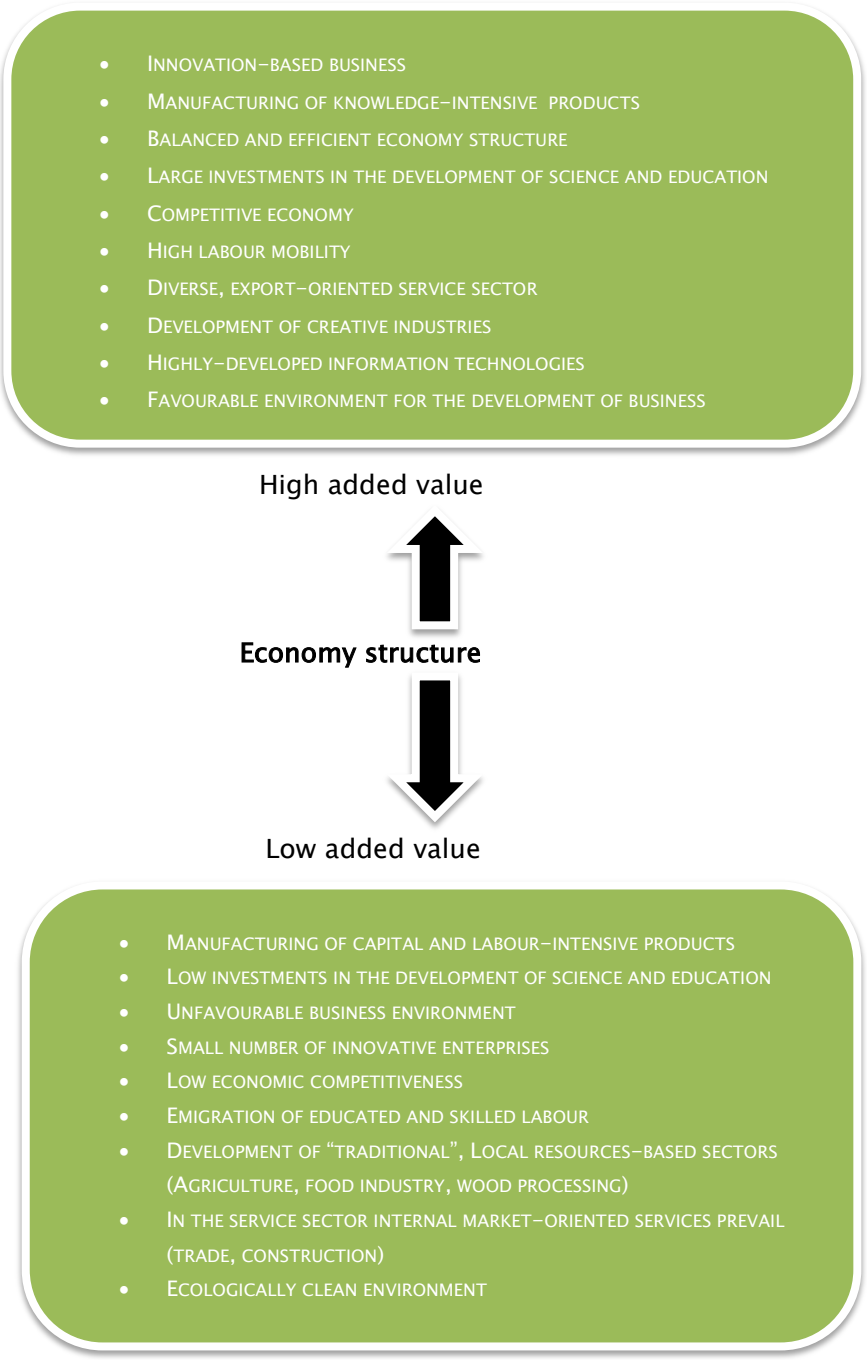

Fig. 4.5. Possible positive and negative economic development aspects depending on the economy structure[87]

In the future a new block will evolve – the republics of the former Yugoslavia together with Romania, Bulgaria etc. and the more of the countries of this block will join the EU the more pronounced will be the trend for them to form a separate block. Thus the EU enlargement may facilitate the disunion process of the EU. Other experts think that in five or ten years in the EU the economy localization trends may

86 Summary of the interviews of the activity „Surveys of the labour market" of the ME implemented ESF project No. 1DP/1.3.1.7.0/10/IPIA/NVA/001 *„ Development of medium-term and long-term forecasting system for demand of labour market"*.
87 Figure designed by the authors.

become more pronounced, small and independent economies may develop which will focus on the local market. Such a possibility was also expressed by the surveyed foreign experts. According to them, already now in some regions of the EU indirect protectionism can be observed – people are persuaded to buy the local produce and services thus restricting the market freedom.

In the **third stage**, the authors assessed the comparative advantages of the economy of Latvia as well as opportunities and threats of the external environment and determined the possible advantages and disadvantages of each scenario (see Appendix 5). The examination of all external and internal environment factors made the authors assume that in the future the progress of the economy of Latvia could take place toward the first or second segment in the scenario matrix which is substantiated in the programming documents, e.g., in the sustainable development strategy "Latvia 2030" as well as in the Strategic Development Plan of Latvia for years 2010–2013[88], which envisage the restructuring of the economy to producing higher added value goods and services. Besides, the possibility is admitted that the restructuring of the economy of Latvia may be delayed and Latvia may find itself in the III segment of the scenario matrix. Consequently, three different **GDP growth projections for Latvia** were created in accordance with the scenario matrix segments I, II and III (segment IV was excluded, because it would mean the stagnation of economy and deterioration of the economic situation in Latvia). The first GDP growth projection corresponds to segment II in the scenario matrix and envisages **dynamic** GDP growth, which is possible if rapid restructuring of the economy to high added value sectors is achieved and there is strong cooperation among the EU countries. This optimistic scenario is most favourable for Latvia and would allow the country to use its comparative advantages and increase its GDP until the average level of the EU until year 2030. The second GDP growth projection corresponds to segment I in the scenario matrix and envisages a **moderate** GDP growth in the case if a gradual restructuring of the economy toward high added value sectors takes place and there is medium strength cooperation among the EU countries with a relatively severe competition. The authors believe that this is the most realistic of all the scenarios. The third GDP projection corresponds to segment III in the scenario matrix and envisages a **slow** GDP growth. This is the pessimistic forecast which is possible if the restructuring of the economy of Latvia to high added value sectors does not take place and the mutual co-operation among the EU countries is not successful due to the lasting debt crisis and other problems.

In designing the GDP growth projections it was assumed that reporting period 2012–2030 is to be divided in three subperiods:

1) 2012–2014 – the time when Latvia and other EU countries continue to fight or overcome the lack of stability caused by the financial crisis;
2) 2015–2020 – the scenarios are taken into account or structural reforms are made;
3) 2021–2030 (see fig. 4.6.).

88 Strategic Development Plan of Latvia for years 2010–2013, http://polsis.mk.gov.lv/view.do?id=3338.

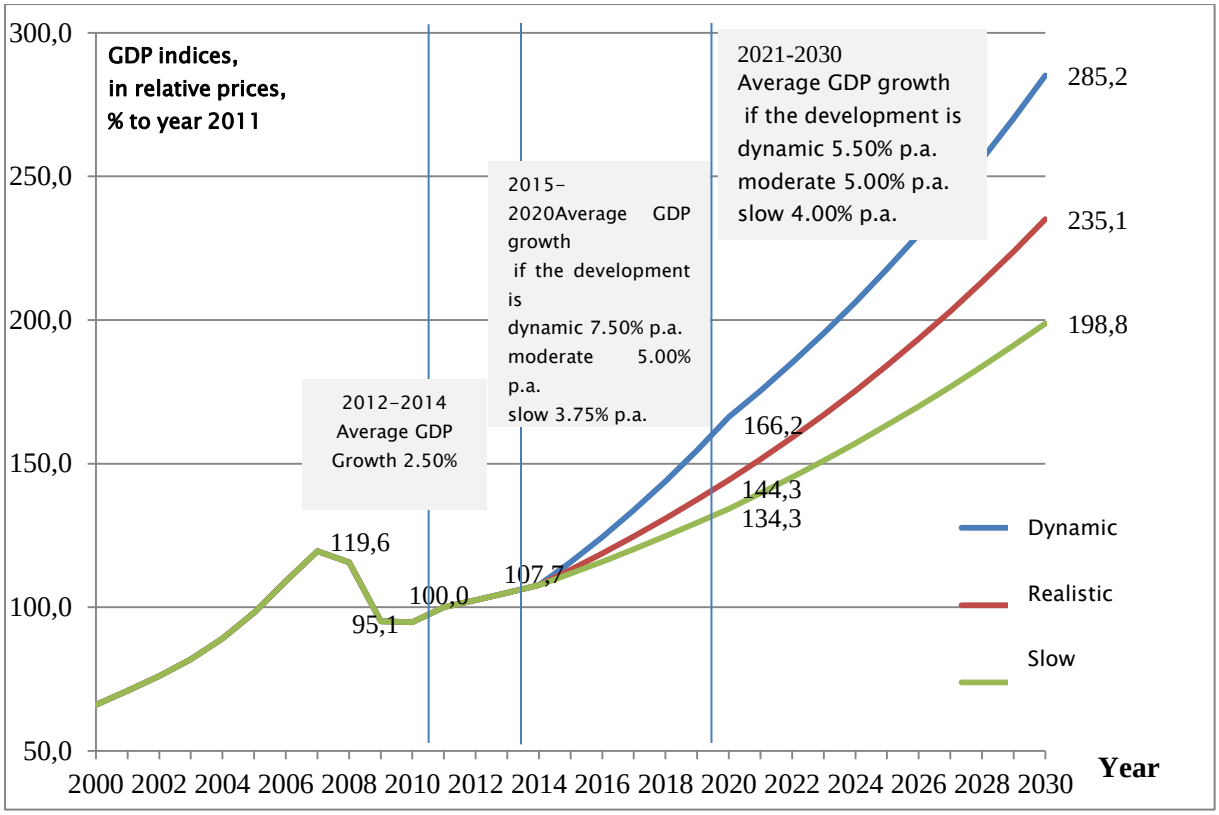

Fig. 4.6. GDP growth projections of Latvia

The assumption about the number of the recovery years in the first subperiod (year 2012–2014) were made based on the conclusions by Reinhart, C.M.; Rogoff, K.S. (2009)[89] stating that in average 3 years are needed for the economy to overcome the consequences of a financial crisis. Respectively, when designing the projections for this period, the Eurostat forecasts for year 2011 were used which envisaged that the actual GDP growth rates in Latvia would change depending on the development of structural reforms. Under dynamic growth, if essential structural reforms are implemented, it is assumed that the initial effect of the reforms on the growth rate is bigger than usually and the GDP growth could account for average 7.5% per year. In the case of realistic GDP growth projection it is assumed that the return to the historically observed rate takes place and the growth rate in Latvia would be average 5.0% per year. In the case of slow growth it is assumed that due to the poor restructuring the actual GDP growth rates could be relatively lower than usually, average 3.75% per year. The GDP growth of 2021–2030 could be average 5.55% per year under dynamic growth, average 5.0% under realistic growth and average 4.0%, i.e., just a little higher than in the previous period, under slow growth (see Appendix 6).

To decide on the validity of the realistic GDP the assumptions were controlled by recalculating the projections as GDP per capita at purchasing power parity (PPP). The recalculations were made based on the assumption that the population growth in the EU and Latvia is equal and on the assumptions on the economic growth:

- Under dynamic growth in Latvia the average level of the EU would be achieved in 2030;
- Under moderate growth, approximately 80% of the EU purchasing power would be achieved compared to the EU average;
- Under slow growth Latvia would achieve 70% of the average EU purchasing power in 2030.

89 Reinhart, C.M.; Rogoff, K.S. (2009) *This Time is Different: Eight Centuries of Financial Folly*. Princeton University Press.

As we can see in Fig. 4.6, the dynamic growth assumption would mean returning to the purchasing power growth seen in Latvia until year 2007. However, in the case of slow GDP growth assumption the purchasing power parity growths would remain at the approximate level of 2011 which would allow for achieving the average level of the EU purchasing power that is slightly higher than the one in Estonia in 2010, 65% of the EU average, but lower than in Slovakia, 74% of the EU average[90].

In the **fourth stage**, for the further analysis of the economy of Latvia and determining more detailed labour market development processes the benchmark country approach was used. Generally, *benchmark* means a sample or measure. Previously in Latvia the benchmark country approach has been used by the Bank of Latvia in its research for the purposes of the export quality analysis and choosing Germany as a benchmark country (K.Beņkavski, R.Rimgailaite (2010)[91]). In the selection of the benchmark countries the authors hereof initially established 3 criteria (number of population, area and nature resources, similar history of economic development). According to these criteria the countries like Estonia and Slovenia corresponded to the benchmark country status as they are similar to Latvia in terms of the number of population, area and history of economic development. During further analysis the criteria of benchmark countries were expanded and the countries with a significantly different level of economic development and economic and employment structure were chosen as benchmarks. As additional criteria for choosing the benchmark countries the following were chosen:

- Stable long-term economic development (a historically stable GDP growth – over 10-20 years);
- Added value per capita by sector (at NACE 2 level);
- Distribution of skills by education level;
- Regional location.

While analysing the economic structure in different European countries (see Appendix 4) as well as economic development dynamics and size of income it was found that the benchmark countries for the development of the economy of Latvia could be Ireland, Denmark, Finland as well as the Czech Republic. In the final stage, in order to check the compliance of the selected countries to the benchmark status the grouping of the EU countries by their economic structure (the proportion of sectors in the added value) in the period from year 2000 to 2010 by using the **method of cluster analysis**. Nowadays the cluster analysis is used in many fields of science when the grouping of objects is needed for deeper studying of a problem. In the general scientific interpretation *cluster* is a set of several uniform elements which can be considered an independent unit with specific features. In economics the term *cluster* appeared in 1970s following the American economist and cluster theory founder M.E.Porter's initiative. Porters distinguished several features characteristic to clusters[92]: Cluster is an economic subject, but not a legal entity, cluster participants, being legally independent, are mutually connected economically; in terms of the activity type and economic status cluster participants are different; cluster participants are geographically close and act within the same region.

90 Eurostat database.

91 K.Beņkovskis, R.Rimgailaite, The Quality and Variety of Exports from the New EU Member States: information provided by very detailed data, Study of the Bank of Latvia, 2/2010, 2010. (In Latvian)

92 Porter M. E. *The Competitive Advantage of Nations*. New York : The Free Press, 1990, p.7.

Within the research hereby to establish the benchmark countries the economic structure of which Latvia could aspire for in the future, three most significant sector groups were included in the cluster analysis with the biggest proportion in GDP:

1. Manufacturing industries, except construction (B–E);
2. Wholesale and retail, transport, accommodation and food services (G–I);
3. Public administration and defence, compulsory social insurance, health and social care (O–Q).

For the purposes of the analysis Eurostat data were used on 25 EU member states, except Romania and Luxembourg as the time series of the available data in these countries were shorter than in the rest of the countries. The clusters were created by the within-group linkage, and the squared Euclidean distance (see Appendix 7) was used as a measure of distance. All together 9 variables were used for each of 25 countries:

- Proportion of the added value by economic activity in year 2010 (XY2010): to record the current situation in the countries;
- *Standard deviation of the proportion of the added value (XY_SE)*: to take into account the fluctuations of the proportion of the added value created in the sector or its stability in years 2000–2010;
- *Difference between the proportion of the added value in 2010 and the average added value proportion in 2000–2010* (XY_2010AV): to take into account the direction of the current changes – the trend to grow or decrease.

The optimal number of clusters was chosen between the limits of 3 and 8. Based on the group stability assessment it was assumed that the countries form 5 natural groups (clusters):

- **Group 1** (8 countries: Belgium, Denmark, France, United Kingdom, Malta, Netherlands, Finland, Sweden);
- **Group 2** (5 countries: Austria, Bulgaria, Estonia, Italy, Slovenia);
- **Group 3** (5 countries: Czech Republic, Ireland, Slovakia, Hungary, Germany);
- **Group 4** (4 countries: Greece, Cyprus, Portugal, Spain);
- **Group 5** (3 countries: Latvia, Lithuania, and Poland).

(The figures characterizing each of the groups are shown in table 4.1.) The first group of countries (Belgium, Denmark, France, United Kingdom, Malta, Netherlands, Finland and Sweden) is characterized by the comparatively similar distribution of the added value among the three examined sectors and higher proportion to the public administration and defence, compulsory social insurance, health and social care (O–Q), average 22.0% of GDP. However, the second and fifth group of countries, also comprising Latvia, are similar by the proportion of the manufacturing sectors (B–E) and public administration and defence, compulsory social insurance, health and social care (O–Q) in GDP and differ by the proportion of wholesale and retail, transport, accommodation and food services (G–I), in group 5 it is the biggest among all country groups (average 29.4%). The third group of countries have the biggest proportion of the manufacturing sector in GDP (average 28.1%), however it is the lowest in group four (only 13.9%). In the first and fourth group of countries the biggest fluctuation (BE_SE) in the proportion of the manufacturing sector (B–E) was observed in the period of analysis. Besides, in both groups of countries the development trend of the manufacturing sector had been markedly negative since year 2000 (BE_2010AV), as a result the proportion of the manufacturing sector in these countries had decreased the

most. A particularly rapid fall in the proportion of the manufacturing industries was seen in the countries of Northern Europe – Sweden, Finland, and Denmark as well as in Malta and Cyprus where the proportion of the manufacturing sector had always been lower than the EU average. However, the fifth group differs from other country groups with the opposite trend: the proportion of the "elementary" services (G–I) has a tendency to rise in Latvia, Lithuania and Poland; however the proportion of the "state" services (O–Q) tends to decrease.

Table 4.1. Figures characterizing country groups

	Groups				
	1	2	3	4	5
	Average	Average	Average	Average	Average
Proportion of sector VA					
BE2010	17.3	22.1	**28.1**	13.9	21.9
GI2010	18.9	21.1	17.0	24.6	**29.4**
OQ2010	**22.0**	16.5	17.1	20.1	14.9
Standard deviation of sector VA					
BE_SE	1.59	1.14	1.58	1.08	1.23
GI_SE	0.75	0.81	0.81	0.85	1.08
OQ_SE	0.86	0.82	0.95	0.91	0.88
Difference between AV proportion in year 2010 and mean AV proportion in 2000–2010.					
BE_2010AV	-4.8	-2.2	-1.9	-2.9	-1.1
GI_2010AV	-0.8	-0.6	-1.4	-0.3	1.5
OQ_2010AV	1.3	0.9	0.9	1.3	-0.4

The comparison of the dendrogram entries for Latvia with other European countries (see Appendix 7) shows that the distance to the second and third group is smaller than to the first or fourth group which indicates that currently the structure of the economy of Latvia is closer and more similar to the Central European countries and less similar to those of the Northern and Southern Europe.

Further in the analysis a deeper analysis of the countries in each cluster (country group) was made to establish concrete benchmark countries by excluding the countries which have radically different features from Latvia, such as:

- Regional location (islands – Malta, Cyprus);
- Number of population and history of economic development (France, United Kingdom, Netherlands, Belgium, Hungary);
- The economic development of which (GDP per capita) is similar to Latvia (Estonia, Lithuania, Poland) or lower (Bulgaria), or the economic development trends are unstable (Greece).

As a result of the country selection just some countries were left in each cluster – the ones Latvia could compare to in the future in the case of different alternative economic development scenarios:

- **Group 1** (3 countries : Denmark, Finland, Sweden);
- **Group 2** (3 countries: Austria, Italy, Slovenia);
- **Group 3** (4 countries: Czech Republic, Ireland, Slovakia, Germany);
- **Group 4** (2 countries: Portugal, Spain).

The economic structure of Latvia would need the least changes for moving toward group 2 countries (Austria, Italy, Slovenia), it is only necessary to decrease the proportion of the "elementary" services. Latvia could approach group three (Czech Republic, Ireland, Slovakia, Germany) if it could change the distribution of sectors in GDP – to decrease the proportion of "elementary" services (G–I) and increase the proportion of the manufacturing sector (B–E). The country could approach the first (Nordic countries) group only with a help of targeted policy because the differences in the economic structure between Latvia and the countries of this group are too big. The advancement of Latvia toward group four would contradict its development strategy which would mean decreasing the proportion of the manufacturing sector and significantly increasing the proportion of the "state" services in GDP.

As 3 different GDP growth projections were also designed for the economic development of Latvia (see fig. 4.6.), the benchmark countries might be different for each of the projections:

- In the case of dynamic development the benchmark countries could be Denmark, Finland, Sweden, which have the biggest differences from Latvia both in terms of GDP per capita as well as their economic structure (see Appendix 4), however all of them are in one region and have a similar history of economic development;
- In the case of the realistic development the benchmark countries could be the countries of group three (Czech Republic, Ireland, Germany), or group two (Austria, Italy, Slovenia), the current economic structure of which is most similar to that of Latvia).

In the **fifth** stage of the scenario development the favoured (or optimal) economic structure of Latvia as to year 2020 and 2030 was designed which can later be corrected within the scenario matrix according to the assumption about the development of the external environment. Based on the favoured economic structure and previous experience of the benchmark countries, in the **sixth** stage, by using the CSB Labour survey data by the occupation in the main job and the last acquired education, the current distribution of employment in Latvia by sectors and occupational groups was assessed and compared to the situation in the benchmark countries as well as the analysis of the future demand for skills in Latvia was made in the sector and occupational group cross-section.

4.2. THE TRENDS OF DEMAND FOR ECONOMIC SECTORS AND DETERMINING FACTORS

In order to assess the future demand trends in individual economic sectors, the favoured economic structure for Latvia was created (see table 4.2.). In designing it the following was taken into account:

- Current economic structure of Latvia and its changes over recent 20 years;
- Economic structure of EU15 countries and its change trends;
- Industry structure of the selected benchmark countries;
- Programming documents designed in the EU and Latvia and priorities set by them ("Europe 2020", National reform programme of Latvia for implementing strategy "EU 2020", Long-term development strategy "Latvija 2030");
- Conclusions from foreign research on a balanced economic structure;
- Evaluations of the surveyed foreign and Latvian economy experts[93].

Table 4.2. Existing and favoured economic structure (%) in year 2020 and 2030 in Latvia.

OCCUPATIONAL GROUP	TITLE	2010	2020	2030
A	Agriculture, forestry and fishing	4.5	3.5	3.3
B-E	Mining and quarrying Manufacturing Electricity, gas, steam and air conditioning supply Water supply; sewerage, waste management and remediation activities	18.7	19.5	20.0
F	Construction	5.9	6.5	6.7
G-I	Wholesale and retail trade; repair of motor vehicles and motorcycles Transportation and storage Accommodation and food service activities	30.3	25.0	21.5
J	Information and communication	4.0	5.5	6.0
K	Financial and insurance activities	3.7	4.5	5.0
L	Real estate activities	8.3	8.5	9.0
M-N	Professional, scientific and technical activities Administrative and support service activities	7.3	7.0	7.5
O-Q	Public administration and defence; compulsory social security Education Human health and social work activities	14.8	17.0	17.5
R-U	Arts, entertainment and recreation Other service activities Activities of households as employers; undifferentiated goods and services-producing activities of households for their own use Activities of extraterritorial organisations and bodies	2.5	3.0	3.5
	Total	**100**	**100**	**100**

93 Summary of the interviews of the activity „Surveys of the labour market" of the ME implemented ESF project No. 1DP/1.3.1.7.0/10/IPIA/NVA/001 " Development of medium-term and long-term forecasting system for demand of labour market". (In Latvian)

The comparison of the favoured economic structure presented in table 4.2 with the current economic structure in Latvia shows that by year 2030 the total proportion of the manufacturing and construction sectors (A–F) in GDP has to increase to 30% (in 2010 it accounted for 24.6% of GDP). It is directly connected with the rise in the proportion of the manufacturing industries (B–E) in accordance with the National Industrial Policy Guidelines of Latvia[94]. In the interviews the significance of the manufacturing sector was emphasized by both foreign and Latvian economy experts. Since ancient times manufacturing has been the support of Europe and there are countries where it still has positive development trends. In the centre of these countries there is Germany being the industrial giant of Europe together with the neighbouring countries of Austria and the Czech Republic. Further, there is Sweden which overcame a crisis 20 years ago and now has a strong and competitive industry. The Swedes changed the structure of their industry, invested in high technologies and labour. The surveyed foreign experts also concluded that the whales needed for successful economic development are agriculture, industry and trade. The assumption that an economy can develop without industry has been false. Similar opinions can also be heard in the interviews of Latvian experts who point out the big role of industry and export during the crisis and in the post-crisis period as well as the need for the industrial policy and support in the future. Besides, the Latvian experts consider that selling the shares of *Latvijas Hipotēku un Zemes banka* was a mistake as any country needs its development bank to provide for achieving its interests. They also mentioned that the current manufacturing structure of Latvia is in the situation and stage where very few innovative and technically advanced products are manufactured where there is a different price formation mechanism.

The experience of the OECD countries as well as research suggests that in order to provide for a stable and balanced growth the proportion of manufacturing in GDP must be at least 20%, a half of the manufacturing industries must be high-technology and medium-high technology industries (respectively 20% and 30%). This kind of technological structure of the manufacturing sector was named the "rule of a fifth and a half"[95]. To the authors' mind in the situation of Latvia the favoured manufacturing structure compliant to this rule might look as follows:

- 40% wood processing, food and light industry;
- 10% other low and medium-low technology industries;
- 30% metal and hardware manufacturing industries, plastic and building materials manufacturing industries;
- 20% machinery and equipment manufacturing, chemical industry and its contact industries, manufacturing of electrical and optical equipment and medical instruments.

However, the proportion of agriculture, forestry and fishing (A) in GDP should gradually decrease as at the moment it significantly exceeds the mean indicator of the EU15 (in 2010 it accounted for 4.5% of GDP which was the second highest indicator among all EU countries and exceeded the EU15 average). It also corresponds to the trends previously observed in the EU where since year 2000 there has been a decrease in the proportion of agriculture, forestry and fishing in GDP as well as in the proportional employment. Nevertheless, a part of the surveyed foreign experts consider that the development of agriculture in the Baltic countries is promising, especially dairy farming and organic farming because there is a low population density, relatively much free land for agricultural use and appropriate climate. Some Latvian

94 National Industrial Policy Guidelines of Latvia, LR Ministry of Economics, Riga, April, 2012, p.8. (In Latvian)

95 Акаев А., Михайлушкин А., Сарыгулов А., Соколов В. Анализ динамики отраслевой и технологической структуры экономик стран ОЭСР // Экономическая политика. 2009. № 2. С. 116–127.

experts have also pointed out that in the future world the demand will increase for food products, ecologically clean food, which will facilitate the growth of the industry producing ecologically clean products and organic farming in Latvia as we have an ecologically clean environment and big potential in the field.

The proportion of construction industries in GDP, however, may slightly increase which would be connected with the development of the real estate sector in the future. The surveyed economy experts did not mention the sector under the industries the growth might rely on in Latvia in the future, which is possibly due to the cautiousness after the experienced real estate "bubble", because according to the foreign experts, construction should increase again in the future.

The biggest changes are to be expected in the structure of service industries. In order to provide for the balanced economic development in Latvia until year 2030 the proportion of wholesale and retail (G) in GDP should be reduced, while the proportion of transport and storage (H) as well as accommodation and food services (I) have to be kept constant because they are primarily oriented at the external market. The proportion of information and communication (J) as well as financial and insurance activities (K) in GDP is expected to rise. The development of these industries does not require big material resources, but rather is determined by the available human resources (their knowledge and skills) as well as technologies. It must be noted that since year 2000 similar trends have been observed in the EU15 countries where the proportion of financial and insurance activities and real estate activities in GDP has increased (see Appendix 9). It is also expected that the proportion of public administration and defence; compulsory social security, education and human health and social work activities (O–Q) in GDP will rise. The rise will be facilitated by the growth of the general welfare level which will also increase the demand for education services, by society ageing which will raise the demand for various health-related and social care services. This corresponds to the trends observed in other EU countries in years 2000–2010. Along with the rise in the welfare level there will be bigger interest about various recreation, art and entertainment events which will promote the development of these sectors (and increase their proportion in GDP).

According to the Latvian economy experts the sectors with the biggest growth potential in Latvia are as follows:

1. financial sector, incl. services to non-residents, which will continue to give a slight contribution to the overall growth;
2. all industries comprising research aspects (not only innovations, but also what is called "research and development");
3. tourism;
4. trade;
5. transport, logistics services;
6. information technologies;
7. manufacturing (food, wood, machine building, metal processing, pharmaceutical industry);
8. industries related to human capital (education, culture).

The experts draw attention to the opportunities of Latvia in producing various niche products. They believe that the country must find its specific niches where to be competitive. Thus, for example, Latvia can compete with exclusive and design products if we manage to get into the protected markets of other countries. Similarly, the experts mention the growing and processing of flux products demanded in the external market and not growing in any climate, as well as organic food and other natural products.

In general, the opinions of the research group and economy experts of Latvia coincide and are similar, except the above-mentioned construction and real estate sectors as well as public administration and defence; compulsory social security, education and human health and social work activities (O-Q). Latvian experts did not list them among the sectors with growth potential and the ones for the Latvian economy to ground on in the future. Although foreign experts mentioned namely the health and social care sector among the sectors for which the demand may increase most significantly in the world and EU due to the society ageing. In addition, the foreign experts point out the areas and services of the "green economy" which will be demanded in the world, particularly so in the long-term. In Latvia just some experts mention the manufacturing of alternative energy and organic farming as the sectors where Latvia could compete in the future in the global market, other areas of the "green economy" are not mentioned. Basically, Latvian experts insist that the country should rely on the traditional industries which Latvia has had historically because nothing significant will arise in an empty space, particularly because of the limited human resources. If there is a wish to produce products with high added value and new technologies there must be investments and the emphasis on the research and science must be much bigger.

As a result of the analysis made in the chapter the authors of the research have arrived at the following conclusions:

1. When designing the set of scenarios for assessing the economic development alternatives of Latvia the method of the favoured and unfavoured scenarios was used initially outlining the pessimistic and optimistic future development and developing the moderate vision as a combination of the pessimistic and optimistic future development.
2. To design the set of scenarios two main development axis or critical choices were initially identified which determined four possible development scenarios:
    - 1) Horizontal (external factor determined) axis, which reflects the further development of the EU and strength of the mutual integration of the EU countries (the ability or disability to cope successfully with the challenges the European Union will face in the nearest two decades);
    - 2) Vertical axis (internal factor determined) reflects the structure of the Latvian economy and the improvement and balance of the labour market (connected with the structural changes in the Latvian economy aimed at higher added value sectors and a significant rise of labour efficiency).
3. Based on these two assumptions the scenario matrix was created with four alternative development scenarios characterized by the respective segments in the matrix:

    I. E-European Tiger (efficient and innovative economy with a weak mutual cooperation among the EU countries);

    II. In the Spotlights (dynamic and rapidly growing economy which is based on a close mutual co-operation among the EU countries);

    III. European Outskirts (economy focused on the mutual co-operation among the EU countries with the "traditional", local resources-based industry structure);

    IV. In the Shadow of the Past (a slowly growing economy, oriented at the regional co-operation and internal market).

The further analysis was based on scenarios (I) and (II), both of which could provide for the advancement toward an innovative and efficient economy, however with different assumptions about the mutual integration of the EU countries.

4. In order to illustrate the development dynamics of Latvia the GDP growth projections for different development scenarios were created. The calculations were made based on the assumptions that that:
    - The population growth in the EU and Latvia is equal;
    - Under dynamic growth in Latvia the average level of the EU would be achieved in 2030;
    - Under moderate growth, in 2013 approximately 80% of the EU purchasing power would be achieved compared to the EU average;
    - Under slow growth in 2030 Latvia would achieve 70% of the average EU purchasing power in 2030.
5. For the dynamic growth scenario described by segment II (In the spotlights) of the scenario matrix to be implemented until year 2030 the GDP of Latvia must reach in average 7.5% in the period between year 2015 and 2020 and 5.55% per year between year 2020 and 2030 which is possible if significant structural reforms take place for increasing productivity. In the case of the moderate growth characterized by segment I of the matrix the respective GDP growth rate in 2015–2030 is 5.0% per year.
6. In order to be able to refer to realistic and comparable examples in the further forecasting of skills the benchmark countries were established which better describe each of the scenarios. For the selection of the benchmark countries the EU countries were grouped by the distribution of their economic sectors (proportional added value of the sectors) in the period of 2000–2010 by using the method of the cluster analysis. For the research purposes, to establish the benchmark countries Latvia could compare to in the future the three most important sector groups with the biggest proportion of GDP were included in the cluster analysis:
    - Manufacturing industries, except construction (B–E);
    - Wholesale and retail, transport, accommodation and food services (G–I);
    - Public administration and defence, compulsory social insurance, health and social care (O–Q).

For the purposes of the analysis Eurostat data were used on 25 EU member states, except Romania and Luxembourg as the time series of the available data in these countries were shorter than in the rest of the countries.

7. Based on the group stability assessment the countries formed 5 natural groups (clusters). As a result of the compliance of the groups according to the previously made scenarios it was concluded that:
    1) Under the dynamic growth scenario the countries like Denmark, Finland and Sweden could serve as a benchmark. There the biggest differences are observed in comparison to Latvia both in terms of GDP per capita and economic structure, however all of them are located in the same region and have a similar economic development history.

2) Under the moderate growth scenario the benchmark countries could be Germany, Ireland, Czech Republic or Austria, Italy and Slovenia the current economic structure of which is the most similar to Latvia, but with a higher added value.

8. In order to assess the future demand trends in individual economic sectors, the favoured economic structure for Latvia was created. In designing it:
    - The current economic structure of Latvia and its changes over recent 20 years were examined;
    - The economic structure of EU15 countries and its change trends were assessed;
    - The economic structure of the selected benchmark countries was examined;
    - Programming documents designed in the EU and Latvia and priorities set by them ("Europe 2020", National reform programme of Latvia for implementing strategy "EU 2020", Long-term development strategy "Latvija 2030") were taken into account;
    - Conclusions from foreign research on a balanced economic structure were taken into account as well as evaluations of the surveyed foreign and Latvian economy experts.

The acquired conclusions are essential for analysing the future demand for skills in Latvia to adjust to the global demand trends in accordance with the possible development scenarios of Latvia.

5. CHANGES IN FUTURE TRENDS OF SKILLS' DEMAND

5.1. DETERMINING FACTORS OF SKILLS' DEMAND IN THE EUROPE AND THE WORLD UNTIL YEAR 2030

The trends of the demand for skills are determined by the agriculture development conditions – changes in the global demand for the produce, influence of the technological progress and similar factors.

In the survey "Global Development Horizons 2011"[96] the World Bank has forecast that from 2011 to 2025 the economy in the developed countries will grow by average 2.3% per year, however, the growth of the developing countries will reach average 4.7% per year. Until year 2025 six of the developing countries – Brazil, China, India, South Korea and Russia will provide for a half of the global growth. Until 2030 the income of the inhabitants of China will increase 11 times, USA – twice, Russia, Brazil and Mexico – 1.2 times. The current positions will be lost by the leading transnational companies. Along with the economic development of Chin and rapid globalization of the Chinese corporations and banks the role of the yuan in the global economy will increase. Due to the growing number of population in the world the demand for food will increase by 50% which will facilitate the development of agriculture and food industry as well as a rise in the food prices which will make millions of the world population very poor. *Euromonitor International* forecasts that from 2010 to 2020 China will be able to provide for 9.5% annual GDP growth. Compared to year 2010, in 2020 the influence of the developed and developing countries will be more balanced. China will surpass the USA and its GDP at purchasing power parity will account for 20.7% of the global GDP. The rise in the economic significance of the developing countries will also facilitate the increase in their political influence. The idea laboratory "Free World Academy" forecasts in their report "*Global Trends 2030, The World in 2030*"[97] that the key contribution to the global economy will come from the North America, Oceania, Northeast Asia and Central America. These regions will account for 74.5% of the global gross national income (GNI). However, South America and the European Union will represent 22% of GNI and the Near East and East Africa just 3.5% of the global GNI. Generally the world will be divided in three zones:

1. The growing zone (51.5% of population, 74.5% of the global GDP);
2. The zone of Islam domination (34.5% of population, 3.5% of the global GDP);
3. Decline zone (14% of population, 22 % of the global GDP).

The high income population will account for 34% and the ones with an average income – 27% of all population, consequently, the proportion of the poor will decrease. The growing middle class will also determine the bigger supply of educated labour which will result in lower wages and bigger competition in the labour market. The new jobs will be connected with the development of technologies. This kind of development will be most unfavourable for Europe which hosts poor immigrants and is left by scientists.

96 "Global Development Horizons 2011", The International Bank for Reconstruction and Development / The World Bank, 2011.
97 "Global Trends 2030, The World in 2030" , Free World Academy, 2011.

The most populated countries in 2030 will be India, China, the Balkans, Turkey, the USA, Indonesia, Pakistan, Brazil, Nigeria, Bangladesh, and Ethiopia.

PricewaterhouseCoopers *''The World in 2050''*[98] forecasts the economic growth of "E7" countries (China, India, Brazil, Mexico, Russia, Indonesia, Turkey):

- The economy of China will outgrow the USA already around year 2016 and in 2025 will be ahead of it by 23%;
- Brazil will reach the same level as Germany already around 2025;
- Indonesia and Mexico have the potential to overcome the United Kingdom and reach the level of Italy around year 2025;
- China and India will globally dominate in the supply of industrial goods and services;
- Brazil and Russia will dominate in the supply of raw materials.

Similar forecasts about the global economic development were also expressed by the surveyed economic experts[99] who indicated that in the medium term the global economy will continue its integration. Development will be determined by technologies (in particular the development of information and communication technologies) and the "green economy" sector – both the manufacturing of ecologically friendly food as well as "green" technologies and alternative energy resources. Not only new products will develop, but also new forms of co-operation. Development will continue in China, India and South America and the global economy will to a large extent depend on their growth. The issue is whether as a result of their development they will continue to be low-cost places. Some experts consider that in the nearest time the development of these markets will slow down, while others believe that the prices will rise there as well. To a large extent this will be determined by the ability of China and other developing countries to move to manufacturing of high technology products. The developing economies are about to play a huge role in the global economy, however, the role of the USA and Europe will decrease. China, India and Brazil can already stand close to the USA by its production volume. Some experts, though, forecast the fall of the demand in the USA and a consequent slow-down of the Indian economy. The development of the EU will be determined by the ability to find the exits from the crisis which is still a topical issue in several countries. If the budget cuts continue no growth is expected in the nearest years. Some experts forecast that the recession in the EU will continue for another 5 years, others believe that the fiscal consolidation will be necessary for another 10 years. Much will be determined by the decision on what to do with the burden of national debts which interfere with development. The lesson of the crisis is that healthy manufacturing creates a stable foundation for economy therefore the further development will be largely determined by the ability to hold the high-technology industries, knowledge-based innovative companies and scientific research and development firms within the EU. In the medium term the growth in the machinery and metal product manufacturing is expected which will be determined by the development needs of the countries of Asia, South America and Africa. This is the reason why many experts indicate that the EU growth will continue to ground on the traditional manufacturing industries (mechanical engineering etc.). Others believe that it could be any industry that is sustainable, environmentally friendly and with low energy consumption. Still others indicate that Europe would have to concentrate on quality and new technologies (biotechnologies, nanotechnologies etc.) and combine

98 „The World in 2050: Implication of global growth for carbon emissions and climate change policy", PricewaterhouseCoopers, September 2006.

99 Summary of the interviews of the activity „Surveys of the labour market" of the ME implemented ESF project No.1DP/1.3.1.7.0/10/IPIA/NVA/001 „Development of medium-term and long-term forecasting system for demand of labour market". (In Latvian)

manufacturing with the provision of services. These could be intermediation services between ideas, manufacturing and the consumer, various business services, including financial services in the international trade (the link between Asia and USA). Some experts point out that in the medium term the growth of tourism and accommodation sector is also expected.

According to statistics, in 1990s the employment and salaries grew faster among the employees with lower and higher income which indicates the polarization of the labour market. Moreover, the computerization of many processes and the development of outsourcing have facilitated the polarization even further[100]. The proportion of the employed persons who use computer in their work has grown. According to the Eurostat data, in 2011 the proportion of the enterprises using computers exceeded 90% in the EU (except Romania). The gain from using computers is the ability to do routine tasks without physical and direct presence of a human being as a party of the transaction. For example, in such actions as booking hotels, flights etc., the need for the physical presence of both parties has decreased to individual cases which cannot be standardized. As a result the substitution of clerical jobs with computers has been observed, as it is shown in Fig. 5.1.

Table 5.1. Influence of computerization of the three fundamental task categories[101]

KIND OF TASKS	TASK DESCRIPTION	EXAMPLES OF EMPLOYMENT	POSSIBLE INFLUENCE
Routine task	• Based on certain rules • repeats • execution of procedures	librarians production line workers ticket office workers	substitutinal
Intangible task	• solution of technical problems • flexible mental approach	scientists lawyers managers doctors	supplemental
Tangible task	• adaptation to the environment • adaptation in the communication with other people	truck drivers guards waiters room-maids	Partly supplemental or substitutional

At the same time computers cannot replace people in the jobs where all procedures cannot be described in advance, such as performing of intangible and tangible tasks. If a person has to solve an intangible task (dealing with a first-time task, presenting and checking hypothesis and managing others), the computer can be used as a support to his skills. In physical tasks the person is often required to adjust to changing external conditions in the surroundings and social environment (driving in a dense flow of transport, waiter services in a restaurant, care of the sick). All possible situations and their combinations cannot be defined and a computer cannot ideally replace a human being.

100 Levy, F., and Murnane, R.J. (2004). The new division of labour: How computers are creating the next job market. Princeton, NJ: *Princeton University Press*.

101 Hilton, M.L.; for Education, National Research Council (U.S.) (Center and of Behavioral, National Research Council (U.S.). Division and Sciences, Social and Education) (2008) Research on future skill demands: a workshop summary. National Academies Press.

Based on such an assessment of computer technologies it can be forecast that along with the development and improvement of technologies the number of occupations in the group of highly educated professionals and managers (the ones who also have to deal with abstract tasks) as well as with a low level of education (the ones also having to do physical work) will continue to rise. Consequently, this means that the number of regular (routine) jobs will decrease. This is also confirmed by the recent demand trends in the EU countries which were described in chapter 3 (see Fig. 3.6). Already since the middle of the 1990s in the EU15 countries the trend has been observed of the employment proportion to increase in the occupations which require abstract thinking (OC1-3), however, in the routine jobs (OC4,6-8) the number of employees has been decreasing. Similarly, the growth or no reduction is observed in the proportion of the employment in elementary occupations.

Along with the increasingly faster growth of income in the occupations where abstract tasks have to be completed it is expected that in the future the proportion of employment will increase for such services as health care support jobs, defence service jobs, food services, cleaning and maintenance jobs in buildings and surrounding areas, individual care and service jobs. These occupations are difficult to automatize or to outsource. These occupations do not require a high level of education, however do require natural human qualities – the ability to orient oneself, visual memory, and ability to express oneself. Consequently, the future economy most likely will be not just a knowledge economy, but also economy of services. It can also be observed in the context of the EU15 where over the last fifteen years the employment proportion in service and selling occupations (OC5) has increased.

Putting it all together, it can be concluded that in the future the demand for the following competences may increase:[102]

- Creative solution of problems;
- Complex communication skills, including – "knowing the necessary channels for completing a project", conversation skills, influencing without imposing one's opinion, team-work skills;
- Ability to adjust to changes;
- Ability to self-organize;
- Self-education;
- Systemic thinking.

At the same time the demand could decrease for mathematical thinking skills as along with reduction of the routine jobs, the demand decreases for the ability to carry out routine calculations.

In order to analyse an abstract task, i.e., the trends of knowledge-based occupations, initially, like in the Romer's economic growth model, the highly qualified employees involved in service industries must be distinguished from the ones employed in science and research. The border between "science" and service sector is difficult to determine, however at the point of their encounter a very specific group of the persons employed in "technical services" develops which may have a very significant influence on the employment structure of a country as a whole. This group uses the potential of the services, technologies as well as software applications as tools for the knowledge economy growth. The group comprises programming engineers, technical specialists, engineering and science consultants, software introducers, and technical project designers.

102 Hilton, M.L.; for Education, National Research Council (U.S.) (Center and of Behavioral, National Research Council (U.S.). Division and Sciences, Social and Education) (2008) Research on future skill demands: a workshop summary. *National Academies Press*.

The service sector, however, is often characterized as the one that creates added value – it does not require a high level of skills and respectively has a low level of remuneration. The knowledge-based sectors have the opposite description – they require highly educated labour and offer a high remuneration level. The polarization line of the labour market is drawn between the service sector and knowledge-based occupations which does not correspond to the modern reality.

Nowadays there is not a strict border between manufacturing and selling any more as the customer can influence the features of the final product already in the manufacturing process. Consequently, enterprises pay more attention to the manufacturing services and not so much to the design or manufacturing (see Fig. 5.1). As the technical sophistication of the selling process is growing, there is also a demand for such technical (knowledge-based) specialists who simultaneously possess social and mutual co-operation skills.

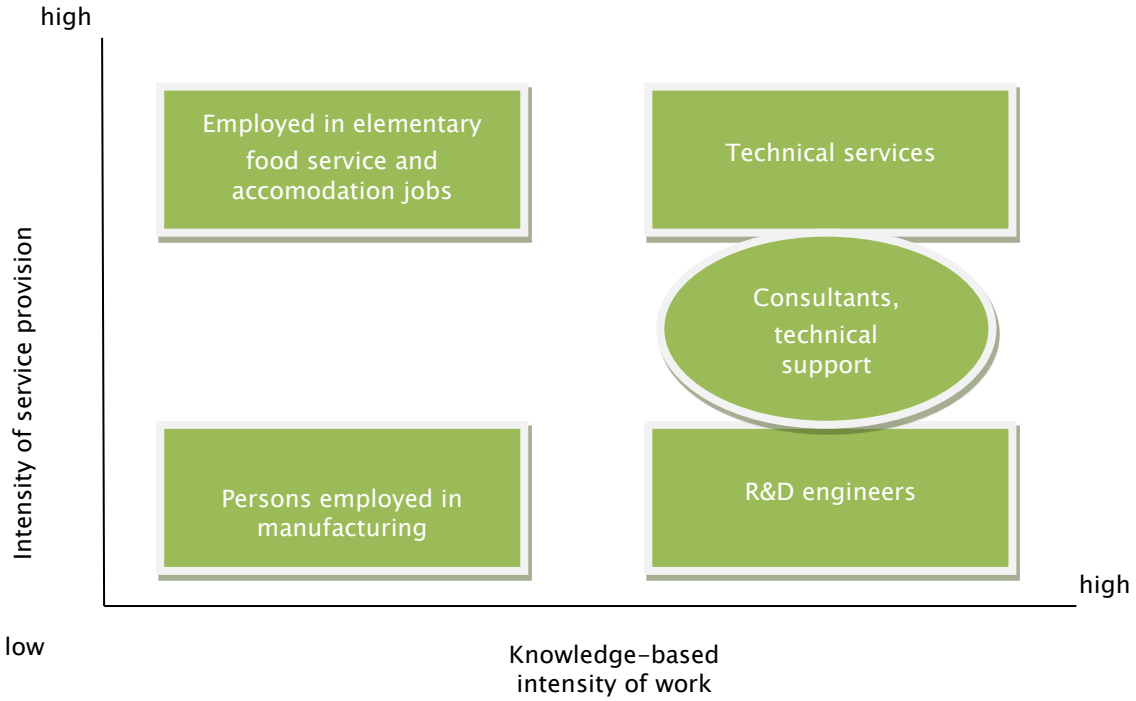

Fig. 5.1. Typology of service and knowledge-based occupations

It must be taken into account that the marginal sector (for example, biotechnologies, IT) tend to create the pre-conditions and technologies for a product production rather than the product itself. That is a process where the research sector interacts with enterprises and their research units for the approbation of ideas in practice and development of technologies for the mass production of the final product – it is more of a teamwork and less of academic research. Consequently, the proportion of the labour with a doctoral degree in the speciality could be small; there could be a higher demand for the specialists with a bachelor or master's degree in the speciality and the so-called soft skills – social skills. The designing of the doctoral dissertation does not facilitate the elaboration of teamwork skills and it is seldom that the issue studied is examined from the commercial point of view, however the high specialization facilitates the student's competitiveness. The acquirers of doctoral degrees lack skills for solving business problems, for example, assessing to what extent it is possible to increase the production volume of a newly introduced product. Consequently, it can be forecast that in the future the demand will increase for

the specialists with the bachelor or master's degree with good social skills. However, if the existing education system does not change and continues to concentrate only on the depth of specialization without developing social and co-operation skills then also in the future two kinds of employees will be demanded in the knowledge-based enterprises – the ones involved in research and in sales. Thus, the demand both for various specialists and service and trade workers will continue to increase.

Among the corner stones of the 21st century there is not just the technological progress and labour hands, but also education and skills which are a driving force behind development. Consequently, a characteristic component of the labour force is the skills that meet the labour market demand.

Oxford Economics, a global level consulting company, has identified a set of skills which will be topical in the world in the long term as well as their determinant factors. A significant impact on the labour market will be made by the globalization trends – the competition will grow between the developed and development countries and changes in the supply of labour will take place because the developed countries tend to face population ageing, however, the development countries demonstrate the opposite trends. At the same time the proportion of older people will continue grow in the developed countries until year 2030 which will be determined by decreasing birth rates and mortality rates due to high living standards and improvement of medical services.[103] As a range of countries in Europe and rest of the world have intended to raise the retirement age, it will directly influence the labour market – the proportion of elderly labour will increase. Moreover, in Europe the set of skills of elderly population differs from that of younger labour – a higher level experience allows choosing a part-time job or becoming self-employed. The proportion of elderly labour is however smaller in the retail and finance and insurance sectors, as suggested by research.[104] In the research "Creating Jobs in a Global Economy 2011-2030" the rise in the demand is forecast in the European health care sector (the demand for the medical staff with the respective qualification will increase under the influence of the population ageing), as well as in the financial sector of the world as well as European countries. The demand for labour will be influenced by the climate change trends and the development of the related industries all over the world – the number of jobs will increase in the renewable energy industries and decrease in the industries which consume fossil energy resources.

The US organization *The Partnership for 21st Century Skills* mentions the following reasons for the necessity for a new approach in educating labour:

1) It is determined by the essential changes in business, economy and employment over time as the changes in the economy structure, the driver of the economy, has been transformed from the prevalence of the industrial to service sector, which has developed thanks to the innovations and knowledge, information.[105] As an example, the sector of information services has been mentioned, the proportion of which in the US output has grown from 36% to 56% over 30 years (1967-1997).
2) It is determined by the growing demand for new skills in the labour market – enterprises in the innovative industries need professionals who can respond flexibly and offer complex solutions, organize the information flow and work in a team. Thus computer technologies replace a man as

103 Creating Jobs in a Global Economy 2011-2030. – The Hays/Oxford Economics Global Report, 2011. – p.15.
104 Ibid., p.18.
105 21st Century Skills, Education & Competitiveness. The Partnership for 21st Century Skills, 2008.

an executor of routine jobs, and these employees are replaced by the labour force skilled in offering solutions and doing non-routine (abstract) work (co-ordinating processes, teamwork etc.)[106]

3) The labour market demands the following skills in the 21st century: critical thinking, ability to deal with a complex of issues, creativity and business thinking, application of knowledge in creating new products etc.

The above-mentioned is also confirmed by the forecasts of the US *Bureau of Labour Statistics* as to year 2020. According to the forecasts, the number of population and hobs will increase in the USA, although the growth rate will be lower than in the decade of 2000-2010.Besides the proportion of labour post 55 years will grow (in 2010 they account for 19.5%, but in 2020 – already for 25.2%). Regarding the industries manufacturing goods the growth of jobs is forecast (by 1.7 million jobs) – in the construction sector and mining industry as well as a slight decrease in the agriculture and industry sectors. In the service sector the growth by 18 million jobs is forecast, mostly accounting for the jobs in health care (+6 million jobs), professional and science services (+2 million jobs) and education sector (+2mln jobs). A rise is forecast in all service industries – finances, real estate, transport, trade as well as health care and education where various specialists both with a higher and secondary education (reception nurses, health care assistants in hospitals and care centres as well as personal home health care assistants) will be needed. The demand will decrease for the postal service employees (in 2010 656,400 people were employed in the postal service, however, until 2020 their number will decrease until 474,600)[107].

According to the long-term forecasts the economy of **Japan** will face the following challenges[108]:

1. Reduction in the number of employees – until year 2055 the proportion of elderly employees older than 65 years will increase in the population up to 40% (in 2005 it was just 20%);
2. The changes in the labour market due to the population ageing – the necessity to attract elderly labour and implement the migration policy for attracting educated labour already until year 2030.

In the future the demand for labour and, consequently, for skills will be influenced by global factors which will determine the development of both individual regions as well as countries. The previous analysis of the economic structure dynamics suggests the growth in the proportion of the service sector both in the GDP of individual countries as well as the world. It can be explained by the growing demand for the products of financial, information and communication and similar industry products. Hence, in the development of individual economic industries and sectors various trends will be observed. As to 2030, the consumption of the agriculture produce is expected to raise as well as the production volumes which will mainly take place on the account of the developing countries. Until 2030 a rise is expected in the consumption of oil and its products both in the developing and development countries. Until year 2018 the rise in the production volumes of ethanol is expected in all regions of the world: USA, Brazil, European Union and China. The rise over 10 years is estimated from 70 million tons to 150 million until 2018. The biggest current and forecast ethanol production regions – USA and Brazil (~70% of the total

106 21st Century Skills, Education & Competitiveness. The Partnership for 21st Century Skills, 2008.
107 Occupational Outlook Handbook. Overview of the 2010-20 Projections. – Bureau of Labour Statistics www.bls.gov.
108 Okamura A., Onuma K., Takehana K. Direction for Japan's Strategy for economic growth towards 2030. – Nomura Research Institute, NRI Papers No.159, November 1, 2010
http://www.nri.co.jp/english/opinion/papers/2010/pdf/np2010159.pdf.

volume in 2030). However, the biofuel manufacturing forecasts suggest that the EU countries will retain the leading position – around 40% of the forecast production volume (almost 20 million tons).[109] In Europe the agriculture industry forecasts are connected with the transport industry – it consumes in average 30% of the total energy volume of the EU. The development trends of Europe are also determined by the transition to lower emission volumes and promotion of the use of renewable energy sources in the long-ter. It is forecast that in the long term 4-18% of the agricultural land in the EU could be used for the production of biofuel (until year 2030). The consumption of biofuel, depending on the region, will grow in the range of 27-48% by its proportion. The changes in the agriculture sector will also influence employment.[110] The forecasts regarding the development of the industrial sector of Europe reach as far as 2020 within the "Europe2020" strategy. The key factors which will influence the development of industry are innovations and the related research capacity – the use of biotechnologies, nanotechnologies and designing of new products.[111] According to the forecasts, there will be a growth in the influence of information and communication technologies on the overall development, including the competitiveness of the economic sectors. The development of the manufacturing sector will also influence the range of skills demanded by the labour market and in the future the issue of life-long learning will be topical. The demand for new skills will also influence the working environment and general flexibility of labour. The long-term development of chemical industry (until year 2030) in the EU is forecast along with the rise of consumption in all sectors, especially agriculture, construction and trade.[112] The investments of the European origin channelled to chemical industry at the extent of 100-500 million US dollars will in a long term rest in Asia and North America as well as some countries of Western Europe and North Africa. The long-term trends in the transport sector will be influenced by the common European policy on the reduction of emissions and movement towards more intensive use of renewable resources. The global dynamics of the volume of CO_2 emissions will remain positive until year 2030, however, with a slower growth rate in North America as well as Europe and Asia. The growth rate of emissions in Europe per year is forecast to be 0.7%, in North America – 0.9% and Asia 2.5%.[113]

The economy of Latvia, compared to the leading regions of the world, is an exception as the cause of its rapid economic development at the end of the previous century was the transition to market economy. As a result of the transition the economic structure underwent a radical change within less than twenty years. This was also facilitated by the accession to the EU and increasing globalization processes. Thus at the beginning of the 21st century the economic structure of Latvia became similar to the EU and the biggest developed countries (USA and Japan). The development dynamics of the key economic sectors is presented in Appendix 8. As the data compiled there suggest (excluding Latvia where a radical change of the economic system took place) service industries developed dynamically in Japan as well. Hence, from a markedly industrial country of the beginning of 1990s Japan has become similar to the EU in the 21st century and possesses a large service sector. This can be explained by the fact that over recent decades the dominant role in the industrial manufacturing of Asia belongs to China and India.

109 World Food and Agriculture to 2030/50. – FAO ftp://ftp.fao.org/docrep/fao/012/ak969e/ak969e00.pdf.
110 Biofuels in the European Union. A vision for 2030 and beyond. – ftp://ftp.cordis.europa.eu/pub/fp7/energy/docs/biofuels_vision_2030_en.pdf.
111 European Industrial Policy – http://ec.europa.eu/enterprise/policies/industrial-competitiveness/industrial-policy/files/communication_on_industrial_policy_en.pdf.
112 Looking Ahead to 2030. A review of trends and influencers in the European chemical industry. – http://www.accenture.com/SiteCollectionDocuments/PDF/Accenture-Looking-Ahead-to-2030.pdf.
113 European energy and transport – Trends to 2030. – http://ec.europa.eu/dgs/energy_transport/figures/trends_2030/.

Along with the changes of the economic structure in the determinant regions of the world (EU, USA and Japan) the distribution of employment in various sectors has changed as well. Statistics indicate that the amount of labour in manufacturing has decreased and it has increased in the service sector (see Appendix 9). The above-mentioned changes in the industrial sector are connected with the rise of productivity and development of technologies which led to the drop in the demand for labour. The opposite has taken place in the service sector – along with the development of new product niches the need for human capital has been increasing and demand growing for educated and skilled labour. This is also confirmed also by the added value created by the service sector – in the EU countries it grew by 58% compared to year 1990 (in relative prices of year 2000), in USA – by 73%, in Japan – by 32%, in Latvia – by 80%. The added value created by the service sector in the world in 2010 compared to 1990 had grown by 78%[114].

The rise in the proportion of the service sector which was seen in the previous two decades also meant changes in skills in the future – in the long term. Gradually the presence of the basic skills will be replaced by a set of higher level skills. The forecasts of the World Bank suggest that in the long term the proportion of the population with tertiary education will increase in the USA as well as in Japan and Europe (see Appendix 10). The key education aim of "EU 2020" is to provide for the criterion – 40% young people with a university level qualification. At the moment in the age bracket of 30-34 in Europe the indicator is 32.3%, with Ireland in the lead (45%), the indicator of Latvia is 26%, but it continues to rise.

Among the factors influencing skills an important role belongs to the external market development which is proved by the dynamics of the indicator of individual export goods over time. The global demand for goods and services serves as a foundation for business activities and it particularly influences the countries which are highly open for the export and import flows of goods and services. The dynamics of the global trade in goods shows that over the recent 30 years the export of the industrial produce has rapidly risen – particularly in the groups of pharmaceutical and electronics goods. A larger analysis of the export dynamics of specific kinds of produce in various countries of the world in years 2000 to 2010 is presented in Appendix 11 which shows that since year 2000 a particularly dynamic growth has taken place in the group of pharmaceuticals determined by the rapid rise of export from the EU, especially from Germany. Japan, however, still has the decisive role in the export of electronic goods. The observed export development trends to a certain extent indicate the previous demand for the labour with the corresponding qualification, however, to substantiate this, a deeper analysis is needed.

A significant influencing factor to be distinguished regarding the future demand for skills is the movement toward the *reduction of emissions* and promotion of the *use of renewable energy* which will certainly change the structure of employment in Europe as well as otherwhere in the world. Thus in the USA the increase in the amount of jobs in the "green economy" sectors has been forecast – not only in energy, but also construction, transport and manufacturing. In the construction sector the rise in the demand for the renovation work has been forecast and a growing market segment where there will be a demand for the occupations, such as electricians, carpenters, managers, machine operators. In the transport sector a demand is forecast in the segment of *energy-efficient automobiles* for electricians, computer specialists, painters, tinsmiths and similar occupations. In the energy industry a range of various level specialists are to be demanded in the sectors of the wind and solar energy, such as –

114 Calculations based on the data from the World Bank.

engineers, welders, construction managers etc. In the production of cellulosic biofuels the demand has been forecast for various qualifications – chemists, machine operators, agriculture workers, technicians etc.[115].

The Institute for the Future in its study for the University of Phoenix Research Institute (USA) pays the key attention to the skills and capabilities of future workers which will be necessary to deal with various jobs and assignments in the forthcoming decades. During the research the key drivers of the future change were determined which will significantly influence the skills necessary to the labour in the future:

1. Longevity – Increasing global lifespans will change the nature of career and learning strategy.

In the next twenty years the number of population above 60 years of age will increase by more than 60% along with a substantial increase in the years of healthy life. This will make medical and health care institutions change the emphasis from a comprehensive medical treatment and care of diseases to the development of an effective system of disease prevention and early detection which will be based on a healthy lifestyle of the society and active care about their health. Such an approach will require essentially new skills and attitude in virtually all occupations related to health and social care (occupations 121, 222, 223, 231, 232, 322, 323, 324, 346 and 513) and reforms in the system of medical education of levels 3 – 6.

On the part of individuals this will significantly change the attitude toward working longevity, career planning, family life and education. In order to acquire the resources necessary for the retirement period people will be economically active also after the age of 65-67. This sets additional requirements for the provision for life-long learning as well as companies will review the traditional career development strategy in order to use the so-called "silver" labour most efficiently by creating a more flexible and diverse labour demand. In this case the reference could be made to the demand for skills in almost all minor groups of occupational groups OC5, OC6, OC7 and OC8 which will be connected with certain tasks and acquisition of new skills in the system of life-long learning which only in rare cases will include raising the education level from the one a person has already achieved to a higher one (progressing from level 0 to 6).

Along with practicing a healthy lifestyle the members of the society will pay increasingly more attention to their diets, way of life and place of living thus providing not only for active and healthy senior years of life, but also developing new skills in organizing their lives.

2. Smart machines and systems will develop – further automatization of jobs will take place which will free human labour from dealing with monotonous, repetitive routine tasks.

In the future decades the relations between the human labour and various devices of automatizing manufacturing and daily life in manufacturing sites, offices and homes which will result in the development of such skills as computer skills, remote communication, self-control and initiative which can be partly be achieved by individuals in the education system of various levels and further improved practically during their professional lives.

115 Pollin R., Wicks-Lim J. Job Opportunities For The Green Economy: A State-By-State Picture Of Occupations That Gain From Green Investments. – Political Economy Research Institute University of Massachusetts, Amherst, June 2008. – p.3.

Robots and similar machines will not just deal with diverse manufacturing operations, but also get involved in training, defence, medicine, security and daily life processes as well as influence people's life in the virtual environment thus replacing people in carrying out some of the processes and significantly changing the role of people in other processes. Thus the issue can be raised about the comparative advantages of people over machines and robots and rational symbiosis between a man and robots. This will decrease not only the need for various routine skills, but will also put forth the need for new and innovative skills in the most diverse sectors of economy and levels of operation. This can affect such major occupational groups as OC5, OC6, OC7 and OC8.

3. The world that is computerized and controlled –massive increase in sensors and processing power make the world programmable.

Extensive and fast development of computer hardware, information transmission and means of communication which will continue in the forthcoming decades will form the era where everything is programmable and can be digitalized. As a result various processes, objects and relations will be subjected to digitalization which will squeeze into the business organization, provision for the health care of individuals, professional relations and personal life, which, in turn, sets certain new requirements for the successful operation of individuals in such a digitalized environment. The skills of this new "digitalization" era will be necessary in all occupational categories, differing by their expression and degree of sophistication depending on the complexity of the job duties and responsibility. These skills are basically attributable to the fundamental skills of future individuals which will provide for their integration in the future society and economic environment.

4. New media forms and relations – new means of communication among individuals are developing which require new skills and culture for processing texts and images as well as for the mutual communication among individuals.

The new multimedia technologies significantly change the communication habits and possibilities. Video technologies, digital animation and other ways of presenting information and the means of communication require new skills for using them successfully for the purposes of daily life. Millions of individuals are gaining access to the most extensive and diverse information which simultaneously requires information selection, synthesis and other skills in the new media environment by simultaneously keeping personal attitude. Generally these new skills could be acquired and successfully used by individuals with a certain level of education (level 3 and higher) over a very large range of occupations which comprise virtually all major occupational groups (from OC1 to OC9) of the current Classification of Occupations.

5. Superstructured organizations – Social technologies drive new forms of production and value creation.

The restructuring of various organizations and development of new forms create new cooperation opportunities in the most diverse scale – from a microenterprise up to global structures – which determine the necessity for the skills of operating in such an environment by successfully developing professional relations in the new social environment. The new generation concepts of organizational forms and skills do not come from the traditional management theories, but rather are based on such

fields as the game theory, success psychology etc., which require the development of new training paradigms and tools. The acquisition of such skills requires a certain level of education (from level 3 upwards) as well as a certain life and professional experience and mainly affects major occupational groups OC1, OC2, OC3 and OC4.

6. A globally connected world – Increased global interconnectivity puts diversity and adaptability at the centre of organizational operations.

Under the globalization impact the geopolitical and economic development division of the world creates significant changes in the employment opportunities of any country; it creates requirements for multicultural labour relations, ability to accept and adapt to differences, communicate successfully with the representatives of various cultures and religions as well as accept untraditional solutions for the promotion of economic development. These processes set the need for individuals to develop and acquire new skills and to revise the existing mind-sets. In order to compete successfully in the labour market in the forthcoming decades individuals have to understand the quickly changing labour market environment and changes in the demand for skills. In the future for their career development workers will have to engage in the activities of life-long learning. Corresponding activities must also be assumed by education and training institutions, business environment and government policy designers by setting education as a national priority which will provide not only for the acquisition of new skills, but also for successful renewal of the existing ones.

It is important to be aware that the development of new skills and the potential demand for them is not that much determined by the traditional demand-forming factors of the labour market, but rather by the dynamic development of the society lifestyle, mobility and consumption strategies in the context of the use of efficient manufacturing technologies and use of available resources which come to a sustainable increasing of the society living standard. The labour market demand for new skills has to be considered a secondary expression of the above-mentioned processes. Similarly, the currently existing division of education levels, standards of occupations and trades and determinant skills for their successful execution are subjected to dynamic change and may change significantly over time which will to a large extent be influenced by the speed of introducing the elements of the new economy and their spread in the economy. This relatively new concept concerns the sectors where people are increasingly more dependent on computers, telecommunications and the Internet in order to manufacture, sell and distribute goods and services. Although there is no definition of the new economy everybody would agree to, there are several aspects economists share. The new economy is a growing global economy where enterprises compete and communicate among themselves in the global market. The high technologies and knowledge-based goods and services dominate in the modern economy. Enterprises must be able to use the advantages provided by the development of technologies in order to survive and prosper in the new economy. The role of knowledge and information is increasing. The ability to organize and communicate efficiently based on this knowledge and information is particularly important for the development of business in the new economy. A knowledge-based and highly technological entrepreneurship has a bigger growth potential and acquired gain than the entrepreneurship that is based on the manufacturing of material property and goods.

As a result of a detailed analysis the following activities have been determined to be implemented in order to facilitate the development of the new economy:

1) to focus on the quality of jobs, not just the number of them;
2) to understand one's functions in the global economy;
3) to have a good understanding of the drivers of business;
4) to co-invest in the improvement of labour skills;
5) to co-invest in the innovation infrastructure;
6) to support industry clusters;
7) to raise the quality of life;
8) to help possibly more regions in introducing the new economy.

Each of these policy steps can be viewed in more detail as in some cases they contradict the previously applied policies. The following measures have to be taken to improve the labour force skills:

1) to create attractive employee training programmes which can also be funded from the unemployment allowances;
2) to create attractive employee training programmes which would encourage enterprises to become the ones that provide the training;
3) to co-invest in the regional associations of the same industry enterprises;
4) to compensate the provision of the life-long learning courses to private colleges;
5) to apply tax reliefs to the enterprises who send their employees to courses;
6) to create the database of training courses where the interested persons could find the information they need;
7) to involve university graduates in scientific projects thus facilitating their further growth.

Generally, the future demand for skills in different countries is closely connected with the range of skills and competences of each level of education.

In ***Europe*** approximately 1000 million vacancies have been forecast for years 2006-2020 20% of which being new and the rest substitutional.[116] Besides, it has been forecast that in the future the majority of jobs – ¾ will be in the service sector. Along with the increase of the number of jobs in the service sector (IT, consultations, insurance etc.) there will a general reduction of jobs in the manufacturing sector (individual sectors, e.g., machine building, will develop and create new jobs) and in the primary sector. Labour market will be influenced by the transition to the "green" or low carbon dioxide emission economy where changes are expected in the energy, water and waste recycling sectors as well as other sectors, such as construction, manufacturing, transport and agriculture, forestry and fishing.[117] Thus the demand will increase both for qualified labour force with the skills to deal with a complex range of issues as well as for specific skills – the proportion of jobs requiring higher education will reach 31% by year 2020% (25% in 2006), however, the jobs requiring medium qualification will account for 48% to 50% in 2020. Consequently, the number of jobs requiring the primary education level will decrease.[118] According to "Europe 2020", at the moment 80 million of the EU inhabitants are low-skilled and forecasts suggest that

116 New Skills for New Jobs. Anticipating and matching labour market and skills needs. – European Commission, Brussels, 16.12.2008. – p.6.
117 Ibid., p.6.
118 Ibid., p.7.

the demand for the workers with such qualifications might decrease by 12 million – this means that the number of the offered jobs will increase on the account of higher skills and this underlines the importance of education not only in terms of primary, secondary and tertiary education, but also regarding life-long learning.

The *Institute for Prospective Technological Studies* forecasts that in 2020 64% of the EU labour will be employed in trade, provision of business services, health care, entertainment and recreation, education, provision of transport and logistics services as well as construction.

A more detailed focus on the demand for skills indicates labour market polarization – concentration of jobs in the high and low qualification sectors. In the period until 2020 the biggest demand is forecast in the occupational groups of managers, professionals and associate professionals (OC1, 2 and 3), as well as in elementary occupations (OC9). This means that *in the labour market of Europe the demand will increase for the management, process organization and decision-making skills, the skills to organize, plan and manage economic activities, manage people, conduct research and perform complicated jobs which require specific knowledge and skills to apply theoretical knowledge in practice*. Besides, there will also be a rise in the demand for physical labour skills and workers doing routine and elementary jobs.[119]

As an example the results of fundamental and applied research and forecast results of some countries can be mentioned which clearly indicate the direction of the global development in the future.

The US long-term labour forecasts suggest that among the occupations with the fastest growth until year 2020 there are groups with various levels of skills, including the ones where highly educated labour is needed, such as health care (+29%), ICT (+27%), science (+16%).[120]
Among the occupations with the fastest long-term growth there are the following representing both secondary and tertiary education levels and respective level of skills:

- personal care, home health aides;
- medical secretaries;
- market research analysts and marketing specialists;
- physical therapists.

However, among the occupations with the fastest fall in the demand there are basically clerical and general and routine occupations – postal service staff, clerks, machine operators, dispatchers etc.

Thus the forecasts suggest that in the *USA in the long term the demand will rise for the specialists with a wide range of skills* – solving of theoretical and practical problems, nursing and provision of qualifies services. The demand will decrease for the elementary and routine work skills.

The US research company *The Future Group* forecasts that in the industrial labour migration mainly the employees with very high or low skills will be involved. Moreover, as it is demonstrated by the US industrial development, the rise in its productivity leads to the drop of employment in the sector. Robots and intelligent software will gradually take over a part of the job done today by human labour.

119 CEDEFOP, March 2012 – http://www.cedefop.europa.eu/EN/Files/9068_en.pdf.
120 Occupational Outlook Handbook. Overview of the 2010-20 Projections. – Bureau of Labour Statistics http://www.bls.gov/ooh/About/Projections-Overview.htm.

In the long-term *the United Kingdom* is forecast to face the demand for skills formed during the education process and most precisely correspond to the 3rd and 4th skill level according to ISCO-08. At the same time it is pointed out that currently there is an insufficient supply of highly qualified specialists with tertiary education. In the future the demand for highly qualified specialists will be determined by economic development – the economic structure which will facilitate the demand for high-level skills (innovations, productivity, research etc.). Such a development will to large extent be promoted by the leaders and managers through implementing the business strategies of their enterprises. Until year 2017 the biggest demand for labour in the following occupations is forecast: managers (OC1), professionals (OC2), associate professionals (OC3). This means that in the long-term in the United Kingdom *the demand will raise for high level skills, such as the management of a business, decision-making, implementation of strategies, public administration, implementation of complicated theoretical and practical tasks, project organization, provision of health and education as well as scientific research services, accomplishing of technical tasks*.[121] The groups connected with the drop in the demand are OC 5, 8 and 9, consequently, the decrease in the demand for the skills in the occupations dealing with elementary routine and physical work, fulfilling orders in various industries of trade, operating machines and equipment etc. will be evident.

In Norway the rise of the employment of persons with a higher and vocational education in the economy is forecast in the long term – until year 2030. There will be a drop in the number of workers with the secondary and lower than secondary education. Thus, it is forecast that there will be a significant change in the structure of the demand for skills: the *demand will rise for the management, decision-making and economic activity monitoring skills, strategic management and similar skills*. The demand for elementary skills will decrease – for the set of skills necessary for doing routine and physical work.[122]

In *Sweden* the growth in the demand for the labour force with the education above the secondary level is expected in the long-term – until year 2030. This means, the labour force having *a higher level of skills, ability to communicate and accomplish more complicated tasks* than in elementary physical or routine jobs.[123]

According to the surveyed foreign experts in the EU in the medium and long-term the demand will increase for:

- highly qualified labour force in IT, communication and technical industries as well as for the managers of these processes;
- engineers, particularly in the "green" industries;
- health care professionals;
- persons to employed in medicine and biomedicine;
- managers of various levels;
- workers in the industrial sector, particularly in the chemical industry;
- international business lawyers, auditors and accountants.

121 Ambition 2020: World Class Skills and Jobs for the UK. – UKCES, 2009 – http://webarchive.nationalarchives.gov.uk/+/http://www.ukces.org.uk/PDF/UKCES_FullReport_USB_A2020.pdf.
122 Roger Bjørnstad, Marit L. Gjelsvik, Anna Godøy, Inger Holm, Nils Martin Stølen. Demand and supply of labour by education towards 2030. Linking demographic and macroeconomic models for Norway. – Statistics Norway, 2010.
123 Trender och Prognoser 2011: befolkningen, utbildningen, arbetsmarknaden, med sikte på år 2030. Statistiska centralbyrån 2012.

However, the demand will decrease for:

- the public sector employees;
- low quality general business people produced by many European tertiary education institutions;
- office administrators with general skills;
- construction sector workers;
- employees in the traditional industries that do not stand the competition of the cheap import from the developing countries of Asia and other parts of the world;
- financial sector workers;
- in some countries, for agriculture workers;
- for low-qualified occupations.

Based on the previously conducted analysis it can be expected that in the future in Europe and other countries of the world the following trends will be observed in the demand for skills:

- along with the development and improvement of technologies the demand for the occupations belonging to the group of highly educated professionals and managers will continue (the ones having to do abstract work) to increase. The demand for the low-educated jobs (involving physical work) will also continue to increase. Consequently, the demand is expected to decrease for the workers in regular (routine) jobs.
- The demand will increase for such large competences as creativity, communication skills, ability to adjust to change, self-organization, systematic thinking. At the same the demand may increase for mathematical thinking as the decrease of routine jobs will lead to a lower demand for the ability to make routine calculations.
- In the point of contact between the service sector and science a very specific group has appeared – the persons involved in the provision of "technical services" which can have a significant impact on the employment structure of a country as a whole. This marginal sector (for example, biotechnologies, IT) will not so much create the product itself, but rather the pre-conditions (technologies) for the manufacturing of products.
- The demand will increase for the specialists with the bachelor and master's degree and good social skills. With the education continuing the concentration only on the depth of specialization rather than developing the social and co-operation skills the employees of two kinds will be demanded in knowledge-based enterprises – the ones involved in the areas of research and sales. Hence, the demand will continue to rise for various kinds of professionals as well as employees of services and trade.
- In the future the globalization trends will significantly influence the labour market – the competition between the developed and development countries, changes in the supply of labour as the developed countries indicate the trend of ageing (this will lead to the increase in the proportion of elderly labour force), however the markets of the developing countries demonstrate the opposite trend.
- The demand for labour will be influenced by the climate change trends and development of the related industries all over the world – the number of jobs will increase in the renewable energy industries and decrease in the industries using the fossil energy resources.

- Until 2030 in Europe and the world the demand will increase for qualified labour force with the skills for solving a complex set of issues. It will be determined by the rising productivity which will facilitate the demand for the labour force with tertiary education.
- The demand will rise for the management, process organization, decision-making skills and skills of organizing, planning and monitoring economic activity, managing human resources, conducting research, accomplishing complicated theoretical and practical tasks, project organization, health and education, provision of scientific services and executing technical tasks.
- In the long-term both in the EU and other countries of the world a significant growth of the demand for medical and health care staff, engineers as well as the specialists of ICT and other technical industries will be evident.
- Until 2030 the demand will decrease for elementary skills necessary for executing physical and routine jobs. Consequently, the will be lower demand for the labour force in low-qualified occupations with the basic level of education.

5.2. ANALYSIS OF DEVELOPMENT TRENDS AND INFLUENCING FACTORS OF SKILLS' DEMAND IN LATVIA UNTIL 2030

Along with the changes expected in the structures of the economy sectors and its proportions until 2030 there are foreseen also other significant shifts in relation to the society`s further development and changes in their way of living. It all will be followed by the improvement of technological processes in economy sectors and increase in labour productivity of the employed. According to the economy development scenarios of Latvia there will be a shift until 2030 in the structures of the economy sectors and their proportions that will influence a demand for various skills of potential labour force quite substantially. However, the changes in the demand of skills in the future years will also be influenced by a range of other processes that take place in the economy and society of Latvia by adapting to the overall labour market globalization, society`s sustainable development conception and demographic tendencies in the European region.

The surveyed Latvian economy experts pointed out that in the future the development of Latvian economy will be defined by the availability of finances and labour force, also prices for energy and other raw materials[124]. Increase of labour force productivity and production efficiency, level of remuneration in open labour market circumstances and business environment will also be important. Experts forecast the increase in both wages and prices. Similarly, the influx of investments along with introduction of the euro is expected, new enterprises will develop. Political stability, relations with Eastern neighbours will have a substantial role. In the longer term the economy development will be substantially influenced by the number of people, as the less people there are, the less are possibilities for the economy to develop. It is also possible to forecast a struggle by economic powers for resources and it is alarming because the economic tools may transform into the war ones. Several experts mention the risk of climate changes,

124 Summary of interviews under activity „Interviews in labour market sector" of the ESF project No.1DP/1.3.1.7.0/10/IPIA/NVA/001 "Development of medium-term and long-term forecasting system for demand of labour market" implemented by the Ministry of Economics. (In Latvian)

also energy independence and energy policy. Others think that the ability of the state to introduce structural reforms in the next 10–20 years and to improve the education system will determine a lot.

Experts name the following main growth risks for the Latvian economy:

1. Losing of capacity, quality, national identity;
2. Lack of investments;
3. Shortage of qualified specialists, labour force;
4. Integration of Latvia in the Europe and global world, EU and global crises;
5. Demographic situation and emigration;
6. Society ageing;
7. Availability of finances;
8. Restricted resources;
9. Problems in external market.

Latvian economy experts consider that the world and the EU will develop unevenly. Both local (regional) and global crises are possible that will also have an impact on Latvia. A gap between the rich and poor will widen, society will polarize, and national conflicts are also possible having no projections about the consequences. Protectionism will rise and so will the development of alliances among countries. Competition from Asia and other developed countries will increase and Europe will have to be able to compete under these circumstances and adapt to this situation. Moreover, Latvia has to be able to gain advantage from being in Europe and design the economic policy where the interests of Europe are also the interests of Latvia.

Taking into account the views expressed by Latvian economy experts we may conclude that until 2030 along with changes in the structure of sectors and their proportion the shift in the demand of skills in the labour market of Latvia will be influenced by:

- Consistent development, updating, implementation and improvement of EU, incl. Latvian sustainable development strategies and other shorter term programming documents focusing on maintaining the competitiveness in the global market;
- Increase of globalization processes and the new economy proportion in the economic structure of Latvia;
- Development tendencies in the demographic situation and possible solutions in labour force migration policy;
- Climate changes and availability of energy and other resources.

Globalization processes and increase of the new economy proportion in the common conventional economy structure will produce substantial changes in the demand of skills considering the growing education level of labour force in the next decades. As data in the Appendix 11 show the forecast level of society education in Latvia may substantially change anticipating that in 2035 24% of the society members will obtain a higher education but the rest of the society will have mainly a secondary education. Here we should note that during this period, for example, in the USA the higher education proportion will reach 31% of the total population but in Japan even 48% that points to the limited competitiveness of the Latvian labour force in the global context within basic higher occupational groups with codes OC1 (managers), OC2 (professionals), OC3 (associate professionals) and OC4 (clerks) virtually

in all subgroups also during a foreseeable future. This competitiveness and its relevance will mainly depend on the actually implemented alternatives of Latvian economy development scenarios and structural sector policies. It means that within the sectors the demand for labour and their skills will change not only by groups of occupations but changes are expected also in the requirements of occupation standards for new skills and acquisition depth of the existing skills by categories of occupations.

New economy is a knowledge based economy where knowledge is seen as a resource of production. It is characterized by revolutionary changes related to the rapid development of communication technologies, innovations and reduction in the role of industrial production (dematerialization). Dominating in the new economy are high technologies and knowledge based goods and services. Enterprises have to be able to use the advantages provided by the development of technologies to survive and prosper in the new economy. Entrepreneurship based on knowledge and high technologies has more growth potential and acquired benefits than entrepreneurship that is based on material assets and production of goods. The new economy brings forward ideas as a significant resource since the job and capital gives a result only when new ideas are created. In the new economy a person itself is the determinant factor in the provision of development. Initiative, innovation, mobility, effective participation in team work, ability to take responsibility and to use modern communication and data processing tools are interposed as general basic skills of the future labour force in virtually all occupations and to successfully apply the skills the 3rd to 6th education level is needed. This, in its turn, requires improvement of the present education system and increasing of its efficiency as well as more active participation of society in the education processes.

It should be noted that as a result of acquiring information and knowledge a necessity for labour force with definite routine skills will reduce, rapid development of labour productivity and further automatization of production processes takes place. Employment may be inconsistent, subjected to market opportunities and risk factors therefore constant learning to acquire diverse skills is important since the new economy requires flexible change of skills. The role of life-long learning will become significant to people with the first and second education level as a demand for such employees may appear very dynamic and insufficiently consistent. It particularly concerns basic occupational groups OC7 and OC8. While acquiring education levels 3 to 6 the skills required by the labour market have to be included in the training and study programmes that will form a part of the new occupation standards.

Over the last ten years when preparing for the changes the European Commission has elaborated and adopted several action plans for the development of the new economy in the EU[125] with particular emphasis on the "Digital Agenda for Europe" adopted in 2010 and defining the EU goals in different fields related to the new economy (spread of broadband lines and internet, e-government, e-commerce, research and development (R&D) extension etc.). In the programme the EU has also identified the most significant obstacles that seriously hinder the efforts, either single or in complex, to use ICT at the European level and to develop competitive economy (for example, EU expenditures for ICT research and development reach only 40 % from the level of USA, distribution of optical fibre high-speed network in Europe reaches only 1% while in Japan it is 12%).

125 "eEuropa 2002" (2000), "eEuropa +" (2001) for EU candidate countries, "eEuropa +" 2005" (2002), "i2010" (2005).

The implementation of a sustainable consumer strategy, however, takes place by changing the attitude of post-industrialism society towards consumption and participation in governance processes at different levels that is possible by society members acquiring new skills and abilities to satisfy own inclusion and consumption needs. Recent scientific findings in natural sciences and technological outputs may introduce substantial changes not only in the development of separate sectors but also in the demand of various skills among subgroups of major occupational groups OC2 and OC3.

Besides, many problems are caused by demographic development tendencies. To address these problems in the next periods the Latvian society will have to look for effective tools with regard to:

- Low birth rates and relatively poor health status of people and restricted treatment opportunities;
- Society ageing and increase in proportion of elderly employees;
- Significant emigration to economically better developed world regions;
- Lack of effective and balanced immigration policy.

Significant improvement of public health will be required to improve the current situation by implementing the measures for strengthening of the family institution, health of the mother and child, introducing healthy way of living in the everyday life of people and reinforcing the responsibility of individuals for their health status. These measures will require not only substantial material and human resources but also will require new skills from the society members and relevant staff with regard to healthy, productive society development. It is fully referable to the occupation sub-groups as 121, 122, 212, 221, 222, 223, 231, 247, 322, 324, 346 with the 3rd to 6th level of education (according to ISCED97 classification).

Experience of other countries shows that society ageing causes not only the demand for new skills in the social care field but also the necessity to establish and provide specific working places for the pre-retired and retirement age people as well as to provide for the psychological willingness to increase their inclusion in the labour market. A rather peculiar situation may arise here about the creation of working places in the so-called elementary jobs for the employees who have a higher education level acquired before but who, due to the old age, physical and mental features cannot anymore perform working duties in a qualitative and effective manner demonstrated in their best working life years but they still wish to stay active in the labour market.

Change trends in the demand of skills deriving from Latvian and European strategic documents and overall society development processes over the world may manifest in the following ways:

- Demographic tendencies in the society and explicit society ageing as well as employment problems of elderly employees and necessary solutions will cause changes in the skills required not only not only for the employees who are working in social care and health sectors but also for representatives of the state, municipal and non-governmental organizations. This will also have a significant influence on the practice of addressing employment solutions in the private business sector. As the practice of other countries shows, already now with active integration into labour market of the so-called "silver" labour force, the demand for new skills increases in accordance with their physical and mental status;

- Development of production technologies and further automatization of production processes will cause appropriate corrections in the demand for new knowledge and skills for the employees in various industrial, financial, communication and public administration and other sectors across mainly all groups of occupations.

The authors of the research hereby consider that also the shift in the society attitude towards the decisions to emigrate from the country is significant. It requires a definite set of measures and skills of the involved persons to stop the emigration wave and possibly turn it back. The notion of emigration is highlighted also by the inquired Latvian economy experts. According to their assessment emigration will continue and measures have to be implemented for re-emigration. Some express the assumption that a part of the people could return to Latvia if the state promised benefits for moving back, tax reliefs. While others express the view that without imported labour force it will not be possible to cope with the situation. It is needed for the reproduction of the nation and also to make rudimentary future. Considering the rather critical Latvian demographic situation (population age structure, changes in numbers) experts forecast that during 20 years Latvia will be compelled to change very significantly – including by actively attracting a foreign labour force. The positive side here is that Latvia in this situation will receive able-bodied people and that they will become consumers by increasing the aggregate demand. In this turn it will promote the development of new enterprises to ensure goods and services for people by giving an impetus for both the increase of gross product and further development. At the same time being aware of the necessity for definite labour force immigration a wise and selective state policy should be realized and foreign labour force must be utilized as effectively as possible according to their education level and acquired skills. The state must implement mutually acceptable and effective integration policy that in turn may require not only definite material resources but also the ability to provide the people who have arrived in the country with the necessary language, culture and other specific skills that can cause the demand for new skills in the subgroups of occupations as 231, 232, 233, 234, 235, 333 and 334 regarding training of foreigners among whom there will be representatives from other cultures, religions and mentality.

Besides the possible scenarios and policy realization alternatives designed for the development of the economy of Latvia that define the structure, proportion and growth rate of economy sectors there are many other factors that in the future will define the necessity to acquire new skills and labour market demand for these skills.

Successful implementation of the elaborated EU and Latvian sustainable development strategy is possible only when the attitude to further functioning of the economy is changed, i.e., consistent and targeted transition to the eco-economy that is related not only to an energy-efficient economy which is environment-friendly and aimed at saving resources but also provides for implementing sustainable consumer conception in practice. The changes in the functioning of the economy will create an increased demand for skills with regard to efficient acquisition of alternative renewable energy, producing new materials, production automatization and robotisation that will inevitably increase the demand for qualified engineering specialists of the respective fields in the following OC2 occupation subgroups: 211, 212, 213, 214, 221, 222, 231, 232, 233, 234, 235, 241, 242, 244, 245, 248; OC3 occupation subgroups 311, 312, 313, 315, 321, 331, 334 and 344. New skills will be related not only to forming and

functioning of the "green" economy but also to its acceptance as the living standard among all society layers and social groups.

Increase in the efficiency proportion of the "green" economy, energy saving and use, further development of waste management as well as rooting of sustainable development paradigm in the cognition of the society will change people's attitude towards the surrounding environment and economic activity and consumer strategy. It all together taken may lead to new skills of individuals not only in performing different working duties but also in everyday situations.

According to CEDEFOP studies the gradual transition of the next decades towards the "green" economy will call forth the necessity to implement a special policy by means of which the so-called "green" skills will become a constituent part of almost each work performance and everyday life, similarly as it happened with the skills of information technologies. Now, however, both consumers and business sectors need much more relevant evidences about the financial gains from the investments in green technologies. The Europe 2020 Strategy presents elaborated "20-20-20" targets – at least 20% reduction in the EU greenhouse gas emissions from the levels of 1990; raise the share of the EU energy consumption produced from renewable resources to 20%; and reduce the energy efficiency by 20%.

According to the undertaken studies occupations have been identified that could have a major impact from the "green" jobs created by the "green" economy. It is forecast that the demand for environment engineers, nanotechnologists associated with development of new technologies, energy auditors, adjusters of solar energy equipment, installers of isolation and heating systems, also specialists in waste collection management and recycling will increase which means that substantial content changes at different levels could apply to virtually all education levels (from level 0 to 6).

CEDEFOP study results about the new occupations and accordingly also the new skills in relation to "green" thinking and much broader introduction of the economy are summarized in Table 5.2.

The lack of the appropriate skills for the future "green" economy needs is related to various factors, especially if it is associated with the so-called "low prestige" jobs. It is very difficult to attract youth to the working places that are incorrectly associated with "dirty", low-paid and poor working conditions, especially so at the beginning of their working career. Besides, there is a tendency that too few young people choose to study engineering, physics and mathematics. Although with the development of the "green economy" the needs for specific skills are growing in their significance, also the increase in the demand for general skills like selling and customer service, team work, management, leadership and entrepreneurship is gaining topicality. Employers are putting forward the requirements for the training system to ensure better and more proficient training of the basic competences especially regarding those directions that are related to the performance of "green" jobs.

Table 5.2. Occupations and skills required by "green" economy[126]

LEVEL OF SKILLS	OCCUPATION
High level skills	Nanotechnologists Energy technologists Environmental engineers
Average level skills	Energy auditors Vehicle emission controllers Isolation specialists Electricians Installers of solar energy equipment Sheen metal processing specialists
Low level skills	Waste collectors Waste processing workers

The transition to the "green" economy will create not only new working places but also change the amount and type of work. To provide "green" skills it is a requisite to revise the existing study and training programmes, qualification standards and to increase the qualification of the teaching staff. For example, Germany plans to create 500 thousand working places in "green" sectors until 2020 and till 2030 the number will be grow to 800 thousand[127]. Consequently, the demand for the appropriate qualification specialists is forecast to grow, moreover, the lack in the specialists of engineering has been identified. The ageing of the labour force and insufficient supply has to be pointed out as a significant tendency[128]. New skills have been identified in all sectors varying from the higher education level to vocational skills. For example, the demand for engineers, technicians, technical assistants in the renewable energy sector.

Estonia also refers to the topicality of the qualification increase in the labour market in the context of the "green economy". It includes trainings at the 1st–3rd level, also life-long learning. Studies prove that elderly people lack digital skills. The analysis of individual sectors shows that there is a demand for the appropriate skills in the following groups of occupations – engineers, researchers in the "green economy" sectors (energy, transport, agriculture, construction), architects, technicians, consultants[129].

In overall, the studies indicate that the "green" economy will not greatly create new skills but rather will facilitate the adjustment of the current skills and their adaptation to new working conditions[130]. For instance, investments in railway transport will create new jobs but not changes in skills. However, this statement could be also questioned if investments are made in the railway electrification. Thereby changes in skills in the "green" economy context may be qualitative and quantitative. In addition, the research shows that changes in occupations in the long run are tended to the increase of qualification and growing demand for the so-called "white collars". New skills in this sector will be defined by innovations, consumer preferences and environmental changes.

126 CEDEFOP.
127 Skills for Green Jobs. Germany. Country Report. – CEDEFOP – p.8.
128 Ibid, p.39.
129 Skills for Green Jobs. Estonia. Country Report. – CEDEFOP – p.47.
130 Skills for Green Jobs: A Global View. – ILO, CEDEFOP, 2008.

Hence, during transition of sectors towards "greener" production and service provision process current working places will create the necessity for the improvement of the skills of the present labour force. However, the anticipated changes reflected here optimistically may look rather differently in practice in relation to a relevant, in some cases difficult-to-regulate, increase in costs which can significantly reduce the availability of the respective goods and services for the society groups with lower income and, consequently, reduce not only the overall demand due to the high prices but also form a far-from-positive attitude towards the "green" economy due to its unavailability. This factor is relevant for the countries with lower development level, including Latvia, and the situation is not forecast to change significantly in the near future. An illustrative example in Latvia could be the mistakes in the production of alternative energy resources during the previous years, state support and procurement rates that are actually implemented at the expense of consumers.

5.3. DEVELOPMENT OF NEW SKILLS' DEMAND IN LATVIA

During the research the link appears between trends of sectors in the demand in the employment field and skill development dynamics. With the shift in the economy structure also the demand for labour and employees changes across sectors and groups of occupations, levels of skills and education. As it was mentioned before, the restructuration of skills in the future will depend on several factors – global trends, changes in technologies, economy structure in Latvia, development of the education system etc.

Viewing expected changes in the demand of skills in Latvia the current situation within separate economy sectors was analysed and a future demand was forecast based on the chosen benchmark countries and developed GDP increase projections. After adding the results of the surveys of foreign and Latvian economy experts an assessment was made on the demand for skills that will develop in Latvia until 2030.

5.3.1. Analysis of future skills' demand in Latvia by economics sectors

Analysing the skills demanded in Latvia in the future, the skills demanded globally have been corrected for the previously prepared Latvian development scenarios (see Chapter 4). Forecasts have been made for the skills demanded in Latvia until 2030 for each economic activity (sector or group) using the analysis of examples of the development scenarios, i.e.:

- By comparing the distribution of the education levels in Latvia with the distribution of education levels in the benchmark countries and based on the previously made situation analysis an interpretation is given about the reasons that could facilitate the distribution changes according to the distribution in benchmark countries;
- By analysing the CSB Labour Force survey data about year 2011 by occupation in the main job (D41k accumulated ISCO-08 classifications at level of two signs) and code of education field (L104k) in order to evaluate the structure of the currently demanded skills and, according to the conclusions in the previous point, to make forecasts about the changes of the skills demanded until 2030.

From the group of the benchmark countries with a dynamic development scenario Denmark was chosen for the comparison as it is closer to Latvia by scale (population number). Germany and Austria were

chosen as benchmark countries for the moderate development scenario. The choice of Germany was defined by its leading position in the market while Austria as it is closer by scale.

Analysis of the skills in demand by economic activity in agriculture, forestry and fishing sectors (NACE2 code A)

If the dynamic development scenario comes true in Latvia, then the distribution of the demand for education in agriculture, forestry and fishing sectors could become more similar, for example, to the division of the demand for education in Denmark (see Fig. 5.2). In this case the relative demand for the employees with the 3rd level education (ISCED5-6) will decrease and there will be an increase in the relative demand for the employees with the basic education. It could denote that more modern and productive standard-type technique will be used and the maintenance of the said would require employees who can perform elementary tasks[131] (routine work) and also physical work[132].

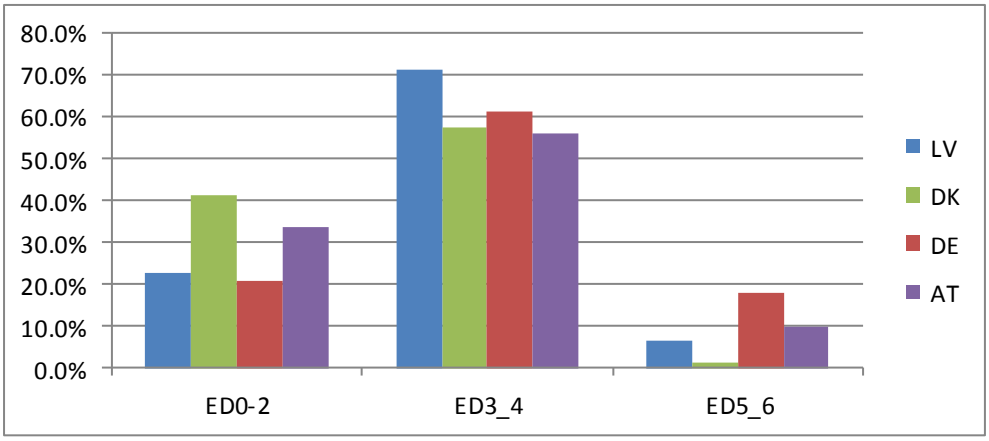

Fig. 5.2. Distribution of employees by education levels (ISCED97) in agriculture, forestry and fishing (NACE2 code A) in 2011[133]

In the case of moderate development as in the case of dynamic development scenario there could be a demand for the employees who can perform elementary tasks with the skills specific to the elementary sector (division of education is close to Germany and Austria). Unlike the dynamic development scenario, the automatization of working tasks could be less applied wherewith the demand for employees who can perform intangible tasks (3rd level education), i.e., could be able to apply a flexible approach in problematic situations, will remain constant.

Since the distribution of the demand in the 2nd and 3rd levels of education in Latvia in the particular sector is not substantially lower or is even higher than in the benchmark countries the differences in the education level do not explain the differences in efficiency. Hence, to identify the reasons for the low level of efficiency in Latvian agriculture, forestry and fishing sectors the CSB Labour Force Survey data have been analysed about year 2011 by occupation in the main job. As indicated in the analysis, there is a higher demand in the sector for the employees in occupation (OC92) Agriculture, forestry and fishing workers with basic general education (010). It is understandable because the Classification of

131 Tasks based on certain instructions and repeating.
132 Tasks required for skill to adapt to environment.
133 Figure made by authors using Labour Force Survey data and Eurostat database.

Occupations[134] states only elementary tasks as the key tasks for the particular professional activities. The second most demanded group are the employees in occupation (OC83) Drivers of self-propelled trucks and equipment and operators of heavy equipment and vehicles with education in mechanical engineering (OC525). The tasks of the professional activity in this occupation are mainly physical – to run, service and work on technical vehicles, however, these require also specific skills. Currently, 35 % of workers in this occupation have general education that is not in compliance with the professional tasks and points to the causes of inefficiency – entrepreneurs have to spend additional expenditures, direct or indirect, to equip the worker with the necessary skills for the performance of the tasks. The proportion of employees with general education in other occupations, except for the elementary jobs, is about 40 per cent.

Workers with elementary skills constitute a majority of the employed. By modernizing and developing more sizable farms the level of mechanization will continue to grow resulting in reduction of the demand in elementary skills in the future, however, the demand for the machine operating skills will increase. With the increase of average farms the subsistence employment will reduce in agriculture, forestry and fishing, consequently, a demand for basic skills in agriculture, forestry and fishing. Due to the increase in the general use of standardized technologies the demand will increase for the medium qualified agriculture workers who have skills to apply standardized technology. The demand for highly qualified agriculture specialists could remain stable or even reduce because the amount of these specialists does not depend on the area of cultivated land but rather on the amount of farms. It is expected that the amount of farms could reduce while the average size of farms could enlarge. Taking into account the tendencies in shifts of population number by regions it is expected that agriculture will become more capital intense with a higher level of mechanization.

In agriculture the large proportion of the employed with general education reduces the efficiency in the sector as a whole and in groups of occupations. Considering the above said the following factors influencing the demand for various skills in agriculture, forestry and fishing may be classified:

- Average farm size – number of farms will decrease but the average size will enlarge;
- EU Agricultural policy – which fields of activity and to what extent will be supported;
- State policy – for example, by interposing biological agriculture as a priority the structure of both employment and skills demand would change;
- Development of technologies – with the rise of the latest technology solutions there will also be changes in the required skills, employees will have to acquire and use new technologies.

Analysis of demanded skills by economic activity in manufacturing industry, electric energy, gas supply, heat supply and air conditioning, water supply, waste water, waste management and sanitation sectors (NACE2 codes B-E)

The forecasts about skills demanded in this sector substantially differ from the chosen development scenario. In the case of the dynamic development scenario like in Denmark and other Scandinavian countries the proportion of the sector GDP should reduce from 22% to about 17%, along with a rapid increase in productivity. It could be possible if modernization of the overall production sector is achieved by introducing more complex technologies that would substitute the work of people as much as possible. As a result, the demand for highly educated specialists who can perform intangible tasks could increase

134 Cabinet Regulations No. 461 (18.05.2010), Appendix 1.

and there would be a relative increase in the demand for workers of elementary jobs for which the level of education is not decisive in their ability to perform professional tasks.

In the case of the moderate development scenario the proportion of the sector GDP should remain at the current level or increase. As the distribution of education levels in Latvia is similar to the distribution of education levels in both Austria and Germany (see Fig. 5.3.), the primary task is to increase efficiency in order to reach the productivity level of the benchmark countries.

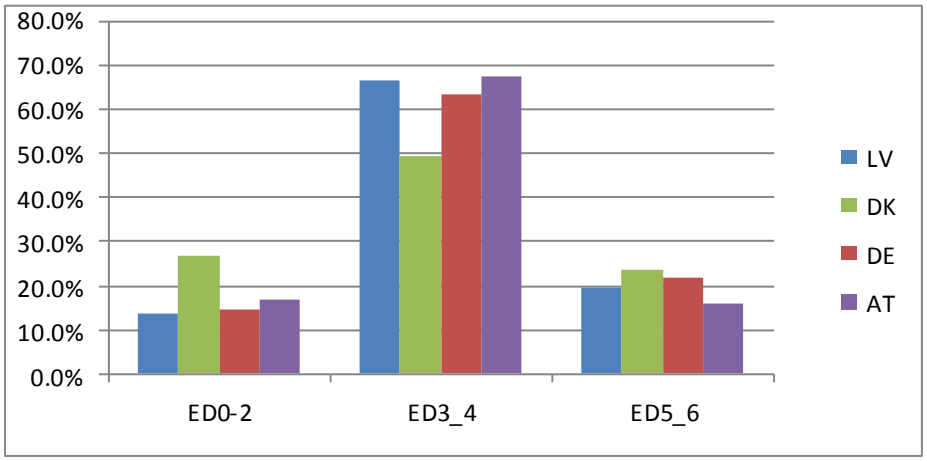

Fig. 5.3. Distribution of employees by education levels (ISCED97) in manufacturing industry, electricity supply, gas supply, heat supply and air conditioning, water supply, waste water, waste management and sanitation sectors (NACE2 codes B–E) in 2011[135]

The examination of the labour force distribution in Latvia in 2011 suggests that the majority of the employed are mining, construction, production and transport workers (about 15% from employees in the sector), food processing and wood processing workers, cloth manufacturers and other craftsmen and workers of related occupations (15% from the employed in the sector), metal working and mechanical engineering workers (10%), operators of industrial equipment (10%), managers of self-propelled trucks and equipment (6%), senior engineering specialists (4%). However, workers who have accomplished general education programmes constitute a very high proportion in the sector in all occupational groups (almost 40% of the employed in the sector). It may be forecast that depending on the chosen development scenario, either on the account of the workers having only general skills the number of the employed in the sector will decrease (in the case of the dynamic development scenario) or they will be replaced by workers who have the skills demanded in the sector (in the case of the moderate development scenario). The main factors influencing the labour force demand in the given sectors are the following:

- Development of technologies – the demand for elementary occupations (basic skills) reduces, the demand for the employees with average qualification who use new technologies increases;
- National and EU support – extent of support and sub-sectors to be supported.

135 Figure made by authors using Labour Force Survey data and Eurostat database.

Analysis of the demanded skills by economic activity in construction (NACE2 code F)

Although the construction sector has undergone the most substantial corrections as a result of the crises of 2008, it is expected that due to the depreciation of houses, relatively low number of square meters per household member, depreciation of industrial infrastructure and non-compliance with requirements of modern techniques and labour safety, the demand for new space will remain sufficiently high in the longer term disregarding the realized development scenario but it depends on the expected rate of aggregate growth of income.

Since the distribution of the education levels does not differ substantially between the benchmark countries and Latvia (see Fig. 5.4.) the main challenge in the sector is to increase efficiency by reducing alternative expenditures, *inter alia*, disclaim engaging of workers without the necessary skills by providing them with further training.

Constructors constitute the major number of the employed in the construction sector, workers of the related occupations (35%), workers (>10%), operators of vehicles and equipment, production managers, lawmakers, officials, metal processing workers, workers with electric equipment. Almost a half of all constructors have general education which means that standard technologies are used there that can be acquired at work. Interestingly, slightly more than a half of the workers (group OC93) have general education, the rest have construction, mechanical engineering and other educations. The reasons for that may be the following: work during studies, improper training quality, motivation of workers to learn and work.

A relatively large number of the employed are lawmakers and officials that could be explained by the specifics of the sector, coordination of projects, monitoring, and control – municipal architects and employees of the construction board, etc.

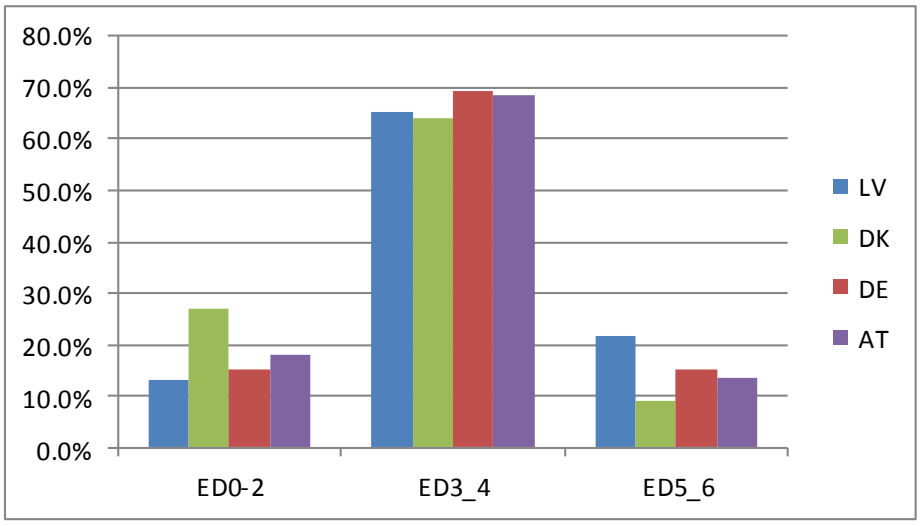

Fig. 5.4. Distribution of employees by education levels (ISCED97) in construction (NACE2 code F) in 2011[136]

136 Figure made by the authors using Labour Force Survey data and Eurostat database.

Like in other sectors, also in construction the high level of the employed with general education influences the efficiency and competitiveness of businesses and limits the use of specific technologies. Predominantly, there are standardized technologies used that require basic practical skills.

In the future the demand for lower qualification specialists will reduce (elementary work skills – to build, dig, push etc.) as elementary jobs will be mechanized. The demand will continue and increase for machine and vehicle operators and accordingly also the respective skills (to run the relevant machinery and vehicles, have a good knowledge of the latest technologies). In the future the demand for management skills (organizational skills, technical skills etc.) and skills of administrative employees (knowledge of legislation, technical skills etc.) will remain effective.

Analysis of the demanded skills by economic activity in wholesale trade and retail trade; automotive and motorcycle maintenance; transport and storage; accommodation and catering service sectors (NACE2 code G–I)

In the case of both scenarios, moderate and dynamic, it is assumed that in Latvia the proportion of G–I sector until 2030 should decrease by 17–21% from GDP. A distinction in the scenarios could be observed in the changes of the education demand distribution. In the case of the moderate development scenario the relative demand for the employees with secondary education will be retained but the proportion of the workers with the first and third level of education will change in favour of the first (see Fig. 5.5.).

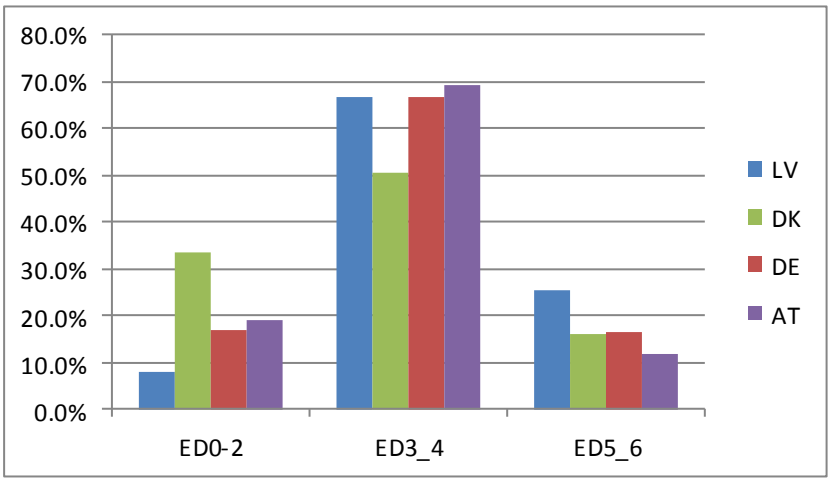

Fig. 5.5. Distribution of employees by education levels (ISCED97) in wholesale trade and retail trade; automotive and motorcycle maintenance; transport and storage; accommodation and catering service sectors (NACE2 codes G–I) in 2011[137]

It can be assumed that the moderate growth in the service sector would mainly mean more effective use of current resources – the introduction of total quality control which foresees precise description of functions, i.e. less non-standard situations for the solution of which the intervention of a qualified employee (with 3rd education level) is necessary to provide for the run of the processes (the demand for employees with the skills to deal with intangible tasks reduces). The demand for the employees who have skills to fulfil routine tasks or physical tasks will relatively increase but it will mainly be on the account of the decrease in the proportion of workers with the 3rd education level.

137 Figure made by authors using Labour Force Survey data and Eurostat database.

In the case of the dynamic development scenario not only the efficiency of current functions would be ensured thereby promoting changes in the distribution of the existing education level similarly to the case of the moderate development scenario, but also the introduction of complex new technologies should take place to substitute the routine work as much as possible. As a result, the demand would decrease for workers who have skills to fulfil routine jobs and at the same time, according to the specifics of the sector, possess social skills – there would be a decrease in the demand for workers with secondary education that would even further increase the proportion of workers with the basic education level.

A distinction in the demand for skills depending on the chosen scenario is noted also in the global trends of the occupation demand. In the case of Germany (a benchmark country with the moderate growth scenario) the proportion of the demand for workers with secondary education increases in the occupational groups substantial in the service sector – clerks (OC4), workers in services and trade (OC5), qualified workers and craftsmen (OC7). The global downward trends in the number of the employed namely in these occupations might suggest that increasingly more qualified workers of these occupations are demanded in Germany. In Denmark, however, along with the general tendency for the number of the employed in the said occupational groups to decrease, there has also been a fall in the proportion of workers with secondary education that indicates not only the increase of efficiency but also a replacement of tasks performed by workers with technical solutions.

The examination of the distribution of labour force in Latvia by occupations and the last successfully obtained education level we may conclude that in the sector of services four occupations compose a half of the overall demand – trade workers (OC52), managers of self-propelled trucks and equipment and operators of lifting equipment and automotive (OC83), workers in individual service sector (OC51) and specialists in business and governance (administration). Likewise, workers in metal processing, mechanical engineering and the related sectors (OC72) are in the demand. However, evaluating the fields of the education last acquired by workers it can be observed that a third to a half of the employed in these occupations has general education. Although social communication skills are determinative in many occupations in the service sector the large number of employees with general education points to the relatively high expenditures (alternatively – time) the local entrepreneurs have to undertake until the employee acquires the necessary skills. Recognizing the previously described scenarios in both cases the rising of efficiency will be noted that also means an increase in the demand for qualified workers. For that reason there could be replacements of comparatively high number of employees with secondary education with the employees who have also completed secondary education but with a specific direction, i.e., definite skills are acquired. While for OC51 and 52 these could be social skills as professional tasks require also communication with the client, in the case of OC72 and OC83 technical skills could be required because professional tasks anticipate the use of different equipment at work that will become more complex and diverse especially in the case of the dynamic growth development scenario.

The demand for elementary occupations in the sector is relatively small and no special skills are required in the professional tasks because of the routine and physical work and therefore it is expected that substantial changes in the distribution of education will not be observed. The situation is different in the "servants" (OC4) occupational group. Since routine work is performed in these occupations, a global tendency will be noted with regard to the reduction of the demand for workers of these occupations. Although, similarly to the sector as a whole, a high proportion of workers have general education, in the

case of both scenarios it is expected that the demand for employees who have skills necessary to collect and systematize statistical, accounting, insurance, financial and other numerical information; keep books and take stock of production and reserves; deal with record-keeping; coordinate traffic timetable of passenger vehicles and trucks etc., will reduce. The main reason for these changes is the opportunity to automatize these jobs.

Analysis of the demanded skills by economic activity in information and communication sector (NACE2 code J)

In the framework of the economic activities in information and communication (J) as well as finances and insurance (K) the next two years will mark an increase of the proportion of the activities and their relevance over the whole span of the economic and social activities of the humanity. The development of information and communication activities will take place not only by penetration in other sectors as a constituent part of the technological progress but also as a means of a definite way of life and self-expression and confirmation of the most diverse layers of the future society (sometimes called also "access" society). Assessing the distribution of employment in the economic activity of information and communication sector by education levels it may be concluded that more than 50% of the employed in the information and communication sector in the analysed countries have higher education (ED5-6) but the employed with a lower education level (ED0-2) range from some per cent to slightly over ten per cent. In Latvia we can observe the highest proportion of the employed with a higher education – 63% comparing, for example, with Denmark and Germany where it is accordingly 58 and 52% (see Fig. 5.6.).

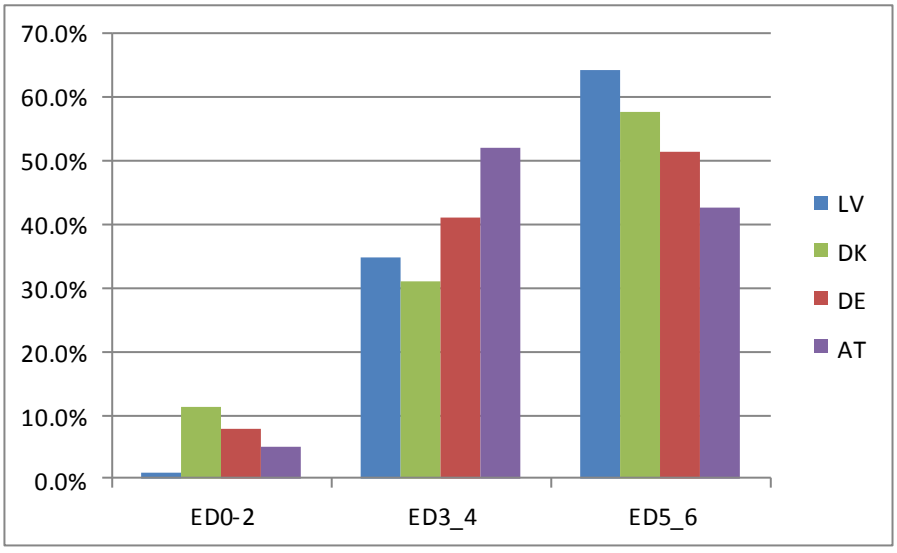

Fig. 5.6. Distribution of employees by education levels (ISCED97) in information and communication sector (NACE2 code J) in 2011[138]

In this sector there is an explicit tendency to use the latest technologies for outsourcing elementary jobs. In the case of the dynamic development scenario it is forecast that in the local market there will be a high demand for the employees who can fulfil abstract tasks and have higher level skills, however the jobs that do not require the demanded skills could be outsourced to the utmost. As a result, a small number of employees could be employed in this sector but they would provide for a high added value. In the case

[138] Figure made by authors using Labour Force Survey data and Eurostat database.

of the moderate growth scenario it may be assumed that the local sector clusters are developed and outsourcing of services is used to a lesser extent. Consequently, an increase in the demand for employees with secondary education could be seen similar to Germany and Austria.

The distribution of labour force used in information and communication sector in Latvia by occupations and the last successfully obtained education level shows that four professions account for more than 60% of the occupations demanded in the sector – professionals in information and communication technologies (OC25) – 27.7%, professionals in legal, social and cultural issues (OC26) – 14.0%, associate professionals of information technologies (OC35) – 9.5% and customer clerks (OC42) – 9.4%. The distribution of these employees by education sectors is conveyed in Table 5.3.

Table 5.3. Distribution of most demanded occupations in information and communication sectors by education fields in 2011[139]

OCCUPATION, OCCUPATION CODE	EDUCATION FIELD AND CODE	EMPLOYED IN OCCUPATION BY EDUCATION FIELDS % OF TOTAL NUMBER	PROPORTION OF EMPLOYED IN OCCUPATIONS IN DEFINED EDUCATIONS %
Senior specialists in information and communication technologies (OC25)	Basic general programmes (010) Management and administration (345) Computer science (481) Electronics and automatics(523)	22.3 7.2 26.4 21.6	77.5
Senior specialists in legal, social and cultural issues (OC26)	Basic general programmes (010) Music and dramatic art (212) Native language (223) Journalism and communication (321)	15.7 11.5 10.2 38.6	76.0
Specialists of information technologies (OC35)	Basic general programmes (010) Economics (314) Library, information and archive studies (322) Computer science (481)	11.2 10.1 13.4 23.2	57.9
Customer clerks (OC42)	Basic general programmes (010) Marketing and advertising (342) Management and administration (345) Hotel and restaurant service (811)	62.6 7.0 9.2 6.9	85.7

The five most significant education fields for the labour force demanded in the sector accounting for 66.7 % of the total number of the employed in the sector are as follows: basic general programmes (010), electronics and automatics (523), computer science (481), management and administration (345) and economics (314).

From the point of view of cost saving and competitiveness the efficiency of using the persons employed in Latvia is gaining topicality along with the issue about the further demand for the labour force of these

139 Labour Force Survey data.

sectors in each of the educational levels, recognizing the possible development scenarios of the economy of Latvia and the methodology of the benchmark country application.

The scenarios differ regarding the distribution of the demand for the education of the labour force. Under the moderate development scenario (benchmark country – Germany) a more efficient use of the current labour resources is anticipated as well as passing of the major part of human routine operations to technical means, further formalization of the procedures thereby reducing the proportion of intangible work assignments, use of different kinds of outsourcing and attraction of ever more clients to the appropriate service performance and reception operations. Corresponding changes may also take place in the demand for employees with higher education – majority of their abstract operations performed at present gradually may become formalized, automatized and passed for performance to the employees with a lower education level in this way attaining a higher efficiency in using the current labour force.

Under the dynamic growth scenario (benchmark country – Denmark) along with the anticipated more efficient use of current labour resources principally new technical solutions would be introduced in the sector operations, substantial changes and expansion would take place in the range of the provided services and routine work would be replaced with technical solutions. This would certainly bring appropriate corrections in the demand for labour by education levels with an explicit tendency to demand qualified, creative workers within the education level, who possess the abilities to perform new working tasks, communicate across the professional team and fulfil remote work procedures.

Within occupations, just to a different degree, the requirements will appear for new skills defined by such driving factors of human and economic development as the increase in the average lifespan and the related changes in pursuing a professional career and necessity for life-long learning, automatization of working places and releasing of workers from routine tasks, computerization of living and working environment, broad use of various sensors and programming, new communication forms that will propose requirements for new media and means of communication, new production and value creation forms driven by social technologies, as well as further globalization of the world with the diversification of cultures and institutional centres.

Analysis of the demanded skills by economic activity in financial and insurance sector (NACE2 code K)

The further development of financial and insurance activities will be defined by an increase of the material wellbeing along with the desire for a certain stability and security in a dynamic and changing economic and social environment. At the same time also within these activities a swift technological development is taking place and will proceed based upon the latest developments in information technologies, remote service reception possibilities irrespective of the location where the customer is based, twenty-four-hours' time and communication forms, at the same time maintaining a high data protection security, confidentiality and cost efficiency. Consequently, the development of financial and insurance activities to a great extent will depend on the development of the information and communication sector (J).

The evaluation of employment distribution in financial and insurance activities by education levels leads to the conclusion that more than 50% of the persons employed in the financial and insurance sectors of Latvia and Denmark have a higher education (ED5-6) while in Germany the proportion accounts for less

than 30%. In turn, the employed of the analysed countries with the lowest education level (ED0–2) vary from seven to ten per cent. The proportion of the employed with a tertiary education is the highest in Latvia – 56 per cent if compared, for example, to Denmark and Germany where it is accordingly 53 and 28 per cent (see Fig. 5.7.). As seen in the given figure, in Latvia the distribution of the education in the financial and insurance activities is already similar to the dynamic growth scenario benchmark countries (Scandinavian countries) that could obviously be explained by the major role that banks play in the economy of these countries. Consequently, the likelihood of the moderate growth scenario that would also mean changes in the education level distribution in favour of the 2nd level education is less credible. Thus it is expected that the primary task for the improvement of competitiveness will be the increase of efficiency.

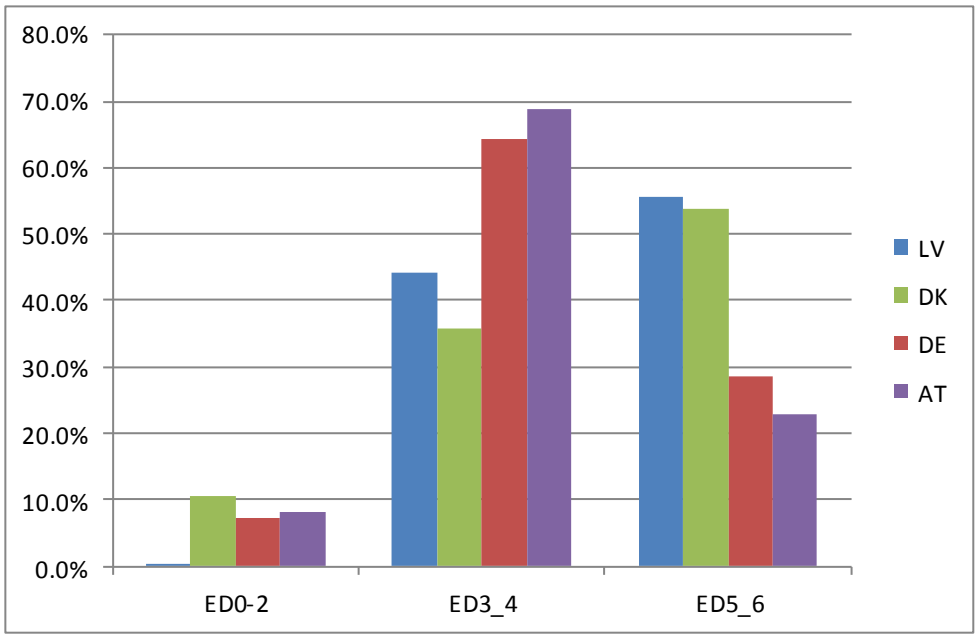

Fig. 5.7. Distribution of employees by education levels (ISCED97) in financial and insurance sectors (NACE2 code K) in 2011[140]

The analysis of the distribution of the labour force employed in the financial and insurance sector by occupations and last successfully acquired education level shows that four occupations account for more than 75% of the occupations demanded in the sector – administrative managers and marketing managers (OC12) – 8.1%, business and governance (administration) professionals (OC24) – 9.4%, business and governance (administration) associate professionals (OC33) – 43.5% and customer clerks (OC42) – 14.0%. The distribution of occupation representatives by education fields is given in Table 5.4.

The five most relevant education fields for the labour force demanded in the sector and composing 75.7 % of the total number of the employed in the sector are as follows: basic general programmes (010), economics (314), finances, banking affairs, insurance (343), accounting and taxes (344), management and administration (345).

140 Figure made by authors using Labour Force Survey data and Eurostat database.

Table 5.4. Distribution of most demanded occupations in financial and insurance sector by education fields in 2011[141]

OCCUPATION, OCCUPATION CODE	EDUCATION FIELD AND CODE	THE EMPLOYED IN THE OCCUPATION BY EDUCATION FIELDS % OF TOTAL NUMBER	PROPORTION OF THE EMPLOYED WITH APPROPRIATE EDUCATION IN OCCUPATIONS %
Administrative managers and marketing managers (OC12)	Foreign languages (222) Economics (314) Management and administration (345)	8.9 68.1 23.0	100.0
Business and governance (administration) professionals (OC24)	Basic general programmes (010) Foreign languages (222) Economics (314) Management and administration (345)	17.1 6.0 34.1 34.8	82.0
Business and governance (administration) specialists (OC33)	Basic general programmes (010) Economics (314) Finances, bank affairs, insurance (343) Management and administration (345)	13.5 20.7 17.6 14.2	66.0
Customer clerks (OC42)	Basic general programmes (010) Economics (314) Accounting and taxes (344) Marketing and advertising (342)	31.0 11.0 11.7 17.6	71.3

Analysis of the demanded skills by economic activity in sector of real estate operations (NACE2 code L)

The added value proportion of sector "Operations with real estate" will increase in the long term and it will be defined mainly by the dynamics of demand, shifts in the economy structure and by reducing proportion of some individual service sectors (G–I). In a long term there will a rise in the added value of the property trade and rent and as a result of management transactions. Along with the sector development and moderate growth scenario the necessity for the employed with a general and vocational education (education level 3–4) will rise within the sector demand for labour. Such transformation may happen as a result of the long-term decrease in the proportion of the employed with the basic education, as it was, for instance, in Germany (see Fig. 5.7.).

[141] Labour Force Survey data.

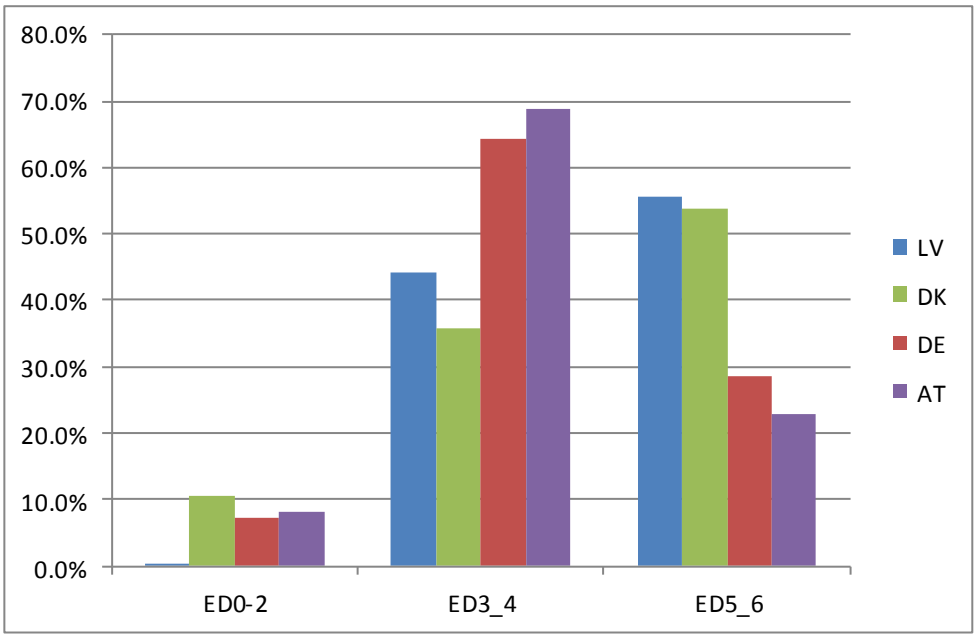

Fig. 5.8. Distribution of employees by education levels (ISCED97) in "Operations with real estate" (NACE2 code L) in 2011[142]

Workers with general education are mainly employed in sector "Operations with real estate" in Latvia: a third of the employed have general basic education. Besides, almost a half of the employed in the sector are representatives of elementary occupations who do low-qualified job like clean-up, waste collection and sorting, post-delivery, duties etc. In the long term the reduction in the proportion of workers of elementary occupations (occupational group OC9) may happen under the influence of the skill demand and along with the increasing demand for qualified labour with vocational (groups OC7-8) and sector-specific organizational, and general management skills related to decision-making (groups 1, 4, 5). The qualification indicators (education level) of the employed may shift depending on the employers' demand and, to a certain extent, as a result of the change of the employed generations (2011 data show that 60% of the employed in the sector are over 40 years of age).

Analysis of the demanded skills by economic activity in sectors related to professional, scientific and technical services; administrative and service operations (NACE2 code M-N)

In the long term, according to the economic growth scenarios, the proportion of sector "Professional, scientific and technical activities, Administrative and support service activities" (M-N according to NACE2) will grow. It will be defined by both the demand for research and technical services and services in administrative and support service sectors. Under the moderate growth scenario the demand for labour with average, vocational and occupational education (3rd-4th level) sectors could increase or the demand for the labour force with higher education (5th-6th level) could reduce. Such changes could take place mainly as a result of the increase in sector "Administrative and support service activities" activities and in the demand for various services performed by qualified labour force with particular occupational skills. Following the dynamic development scenario the sector expansion would create an increasing demand for elementary workers (basic education level 0-2) thereby achieving the similarity to Demark (see Fig. 5.9.).

142 Figure made by authors using Labour Force Survey data and Eurostat database.

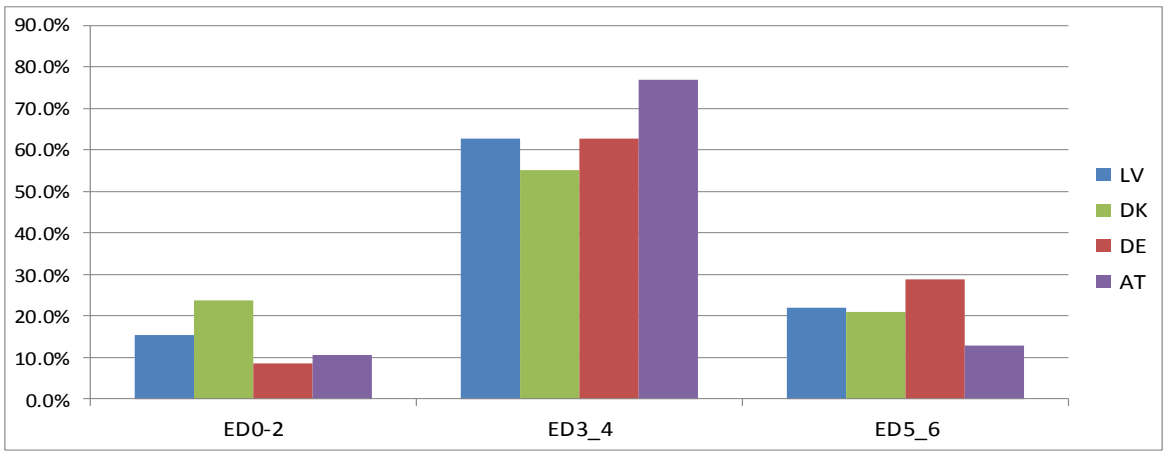

Fig. 5.9. Distribution of employees by education levels (ISCED97) in sectors related to professional, scientific and technical services; administrative and support service activities (NACE2 code M-N) in 2011[143]

Almost 90% of the entire employed in sector "Professional, scientific and technical services" in Latvia are managers and qualified specialists. For fulfilling manager duties planning, management, organizational skills are needed (groups OC11 and 12 – officials, managers, the occupations corresponding to the sector could concentrate in small groups 1114 – officials of Associations and Foundations and 1223 – chiefs of research and development fields). However, for the fulfilment of the duties of a qualified specialist the skills of analysing information are needed. In the long term the demand could increase for the sector specialists who are able to apply theoretical knowledge in practice.

The concentration of the employed in sector "Administrative and support service activities" is observed in elementary occupational group OC9 and group OC54 "Employees of security services". By proportion the representatives of elementary occupations comprise almost a half of the employed in the sector, group OC54 – another one fourth of the employed. Thus the representatives of the sector occupations present a fairly good idea about the general level of skills – the sector is dominated by the demand for skills which can be met by the labour force with general education. In the longer term the changes of the demanded skills will be caused by economic development and technological progress – this can lead to the drop in the demand for low-qualified labour force at first in group OC54 "Employees of security services" and rise in the demand for the qualified employees with vocational qualifications in all sub-sectors.

Analysis of the demanded skills by economic activity in state administration and security, compulsory social insurance; education, health and social care sectors (NACE2 code O-Q)

In Latvia, similar to other EU member states, the state administration and security, compulsory social insurance; education, health and social care sectors (NACE 2 code O-Q) give a substantial contribution to creating total added value and population employment. More than a fifth of all the employed in the economy were employed in these sectors in Latvia in 2011 and the group held the 2nd position by the number of the employed after the trade, transport, accommodation and catering services sector (NACE 2 code G-I). Group O-Q had the 3rd position by rate in total AV (15% of GDP). However, if compared to Denmark and other Scandinavian countries, as well as Germany and Austria, the proportion of public

143 Figure made by authors using Labour Force Survey data and Eurostat database.

services in Latvia in GDP is considerably lower and according to the developed scenarios in the future it should increase (until 17.5% in 2030). Thus it is expected that the demand for different kinds of specialists in the sector will increase that will facilitate both an increase of general welfare level by increasing the demand for education services (NACE 2 code P) and society ageing that will raise the demand for various health and social care services (NACE 2 code Q). Besides, shifts are expected within the sector in relation to the education demand. As it is indicated by the Eurostat data on the distribution of education levels by employees (see Fig. 5.10.) there is a high proportion of the employed with the tertiary (ISCED 5–6) education level in the state administration of Latvia, security, compulsory social insurance; education, health and social care sectors and low proportion with the basic education (ISCED 0–2).

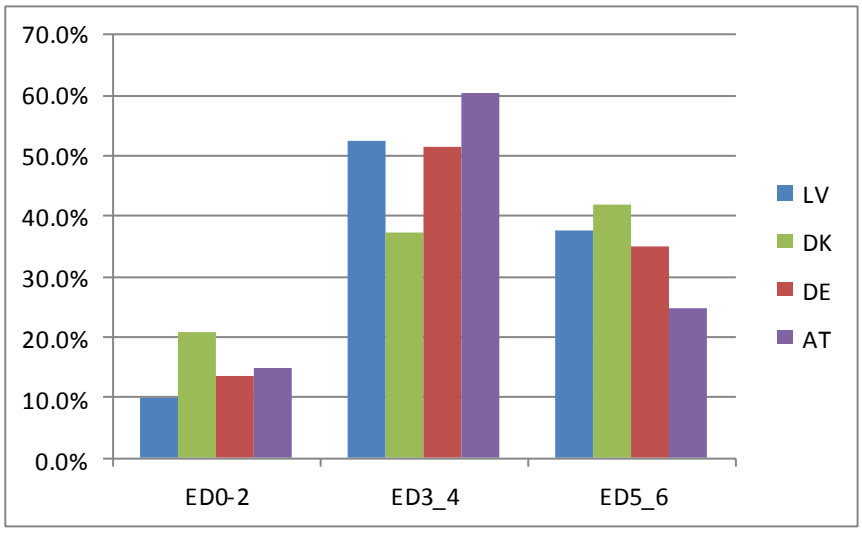

Fig. 5.10. Distribution of employees by education levels (ISCED97) in state administration and security, compulsory social insurance; education, health and social care sectors (NACE2 code O–Q) in 2011[144]

In the future in the case of both dynamic and moderate development it is expected that the relative demand for the employees with the 3rd level education (ISCED 5–6) will decrease but the demand for the employees with basic education will increase, especially if the dynamic development scenario takes place. Meanwhile, in the case of dynamic development the demand for the specialists with the medium education level (ISCED 3–4) could reduce on the account of more efficient use of current employees but in the case of moderate development it could slightly increase and resemble the structure of the education demand in Germany.

The distribution of the employed in state administration and security, compulsory social insurance; education, health and social care sectors by separate education fields (by the last successfully acquired education) shows that the highest proportions account for the specialists from 3 sectors:

- pedagogy and education sciences;
- medicine and social welfare;
- economics, management and legal sciences.

144 Figure made by authors using Labour Force Survey data and Eurostat database.

Their distribution in the sector is rather proportional (10–15% in each sector) and in total they comprise almost a half of all the employed in the sector. However, despite the existing regulations on the definite education level required for state administration, medicine and education employees there is a high rate of the employed (almost one fifth) with general education (education field code 010) in state administration and security, compulsory social insurance; education, health and social care sectors. The majority of employees with general education represent personal care specialists (OC53), cleaners (OC91) and specialists of management and governance (OC33). In the future the demand will increase for qualified employees in OC33 and OC53 occupational groups therefore there could be a tendency for the employees with general education to be replaced by the employees who have definite skills and education in the specific field in order to fulfil particular tasks (care of patients, rehabilitation of persons with disabilities, social assistance, taking care and training of children etc.). Besides, the demand for employees with good social skills will remain constant because professional tasks of the employed in these sectors involve regular communication with clients. There will also be a need for employees of elementary occupations (major group OC9) who could perform various routine and physical jobs (cleaning-up the rooms etc.).

Analysing the distribution of employees in state administration and security, compulsory social insurance; education, health and social care sectors by occupations in Latvia we can see that more than 40% of the filled work places in 2011 were highly qualified occupations (managers, senior professionals and professionals), but in the persons employed in low-qualification (elementary) occupations constituted only 14% of all the employed in public service sectors. One fourth of the total demand is composed by professionals in the education field (OC23) more than 40% of which have obtained education in pedagogy and education science. Only a small part of the education field specialists have general education as according to the Classifier of Occupations of RL[145] education professionals must have tertiary education and secondary education is allowed only in individual cases. Taking into account the demographic trends in the future the demand for education professionals could remain at the current level or slightly decrease. It will also be promoted by digitalization that will increase the demand for distance learning and various interactive training materials leading to the diminishing of the direct contact with the teacher. However, teachers will have to develop digital skills and skills to use different technologies.

The second most demanded occupational group in state administration and security, compulsory social insurance; education, health and social care sectors are various life science and health professionals (OC22 and OC32) three fourths of which have medical education (education field code 721), and most of other employees also have the appropriate education in nursing studies or in other medicine related fields. The demand for the specialists with tertiary medical education (ISCED 5-6) in the future could reduce but the demand for different specialists with vocational secondary education (nursing studies, health care, rehabilitation etc.) could considerably increase. It is related to the swift development of medical technologies, efficient medicine and various medicaments which make it possible to perform simple medical manipulations in the hospitals or in domestic conditions by qualified medical staff (assistants of physicians, doctors' assistants, nurses etc.). At the same time there will also be required qualified employees with the secondary vocational medical education as in the future they will take over a

145 Classifier of Occupations, Annex 1, Cabinet Regulations No. 461 (18.05.2010), p. 131.–141.

part of the functions currently performed by employees with tertiary education (family doctors, general practitioners). The demand will also increase for highly qualified specialists with tertiary medical education (ISCED 5-6) who can perform particularly complex manipulations using the most progressive technologies (lasers etc.). Thereby the demand for specialists with high level skills will increase that is indicative of proficiency and innovation and that are needed to address complex and unpredicted problems in a narrowly specialized field. Also, the demand for different personal care and sanitation services (routine and physical work performers) will increase since in Latvia, as in the world as a whole, the average lifespan and society ageing is growing.

The third most demanded occupational group in state administration and security, compulsory social insurance; education, health and social care sectors are business and administration specialists (OC33) where almost 10% of all the employed in the sector work. Among them almost a half have acquired education in law, economics, management and administration, though a comparatively high proportion of the employed have general education (about 5%) as well. It should be noted that quite many specialists with a technical education (mechanical engineering, mechanics and metal processing) or other education (agriculture, gardening) that is not directly related to administrative work are engaged in business and administrative sector. The demand for business and administration specialists with appropriate education (law, economics, management science) could increase in the future and the demand could decrease for the employees with general education or education not related to administrative work but rather to complex, non-standard situations such as cases in state administration and private sector that need qualified specialists with a broad range of knowledge in specific fields (economics, law, management) as varied cognitive (logic, intuitive and creative thinking) and practical skills are required to find original solutions to abstract problems. To sum up the analysis, several prevailing trends of the skills to be demanded by sectors can be distinguished (see Table 5.5.).

Table 5.5. Trends of skills' demand in sectors O–Q

	BY EDUCATION FIELDS	BY OCCUPATIONAL GROUPS	BY LEVEL OF SKILLS*
Current demand	**Most demanded** education fields: • specialists of pedagogy and education science, • specialists of medicine and social welfare, • specialists of economics, management and legal sciences • those who have attained basic general programmes	**Most demanded** occupational groups: • senior specialists of education field (OC23) • senior specialists (OC22) and specialists (OC32) of health care field • specialists of business and administration (OC33) • cleaners and assistants at home jobs (OC91)	**Most demanded** skills: • low level skills (1st to 4th level of skills, for example, basic skills, also different cognitive and practical skills needed to perform tasks and address problems by choosing and applying basic methods, tools, materials and information) • average level skills (5th to 6th level of skills)
Demand changes in future	Demand will **reduce** for: • specialists of pedagogy and education science, • medicine specialists with higher (ISCED 5–6) education, • those who have attained basic general programmes Demand will **increase** for: • medicine and social welfare specialists with secondary vocational education, • specialists of economics, management and legal sciences	Demand will **reduce** for: • senior specialists of education field (OC23) • senior specialists (OC22) of health care field Demand will **increase** for: • specialists of business and administration (OC33) • specialists (OC32) of health care field • cleaners and assistants at home jobs (OC91)	Demand will **remain** for: • low level skills required for performing various physical and routine tasks, Demand will **increase** for: High level skills (5th–8th level)
Factors defining changes in the demand	• demographic factors and society ageing, • income and well-being level, • technological progress, • digitalization, • scientific progress, • development of new, efficient medicine and medicaments		

*** According to EQF** (see Appendix 1)

Analysis of skills demanded in sectors of art, entertainment and recreation, other services; operations by households – employers; operations of non-territorial organizations and institutions (NACE2 code R–U)

The GDP proportion of these sectors in Latvia and other European countries is not high (on average around 3%), however, it needs to be taken into account that namely in these sectors there is the highest proportion of the self-employed that enables the people who do not want to work full time due to

various reasons (incl., retired people, persons with disabilities, young people etc.) to enter the labour market. Slightly over 40 thousand employees work in these sectors in total (around 5% from all the employed in economy). In the case of the dynamic development scenario the dynamic development of these sectors is forecast in Latvia in the future and the GDP of these sectors could reach 3.5–4% (similarly as it is in Denmark now) that is related to the growth of the demand for services related to entertainment and recreation, also beauty and other personal services. In the case of moderate growth the proportion of GDP could increase but not so swiftly (to 3% of GDP) that will be mainly defined by activities of households as employers and production of subsistence goods and provision of services in individual households. As a result, changes are expected in the education demand in the given sectors. In the case of rapid development the demand for employees who have skills for performing routine and physical jobs to ensure the availability of services could increase while the demand for employees with secondary and tertiary education level will diminish because of the increased use of the latest technologies that raise efficiency. In the case of the moderate growth the demand for elementary, routine work performers would also increase and the demand for employees with higher (ISCED 5–6) education level would diminish while the demand for specialists with secondary education level (ISCED 3–4) would remain constant (see Fig. 5.11.). According to the data summarized in the given figure, currently the employees with secondary education prevail in sectors of art, entertainment and recreation, other services, operations of households – employers, operations of non-territorial organizations and institutions (R–U) in Latvia. Similarly, there is a high proportion of employees with the tertiary education level in Latvia, compared to other European countries, but the proportion of employees with the lowest education level is comparatively small. The highest proportion (7%) is constituted by the employees who have attained education related to beauty services (education field code 815), also in music, art and design field (education field code 211–216) and library, information archive sciences that complies with the specifics of operations in art, entertainment and recreation fields. Among the employed there is a high proportion of employees with technical education (education field code 521, 525), also with education in management, accounting and taxation. More than 30% of employees have acquired only the basic general programmes and have no special education. Majority of employees work in the field of personal service provision (OC51) as well as cloth manufacturing and craft fields (OC75). The majority of employees in highly qualified professions have acquired the special education in the relevant field (music and dramatic art, medicine, library, information and archive sciences).

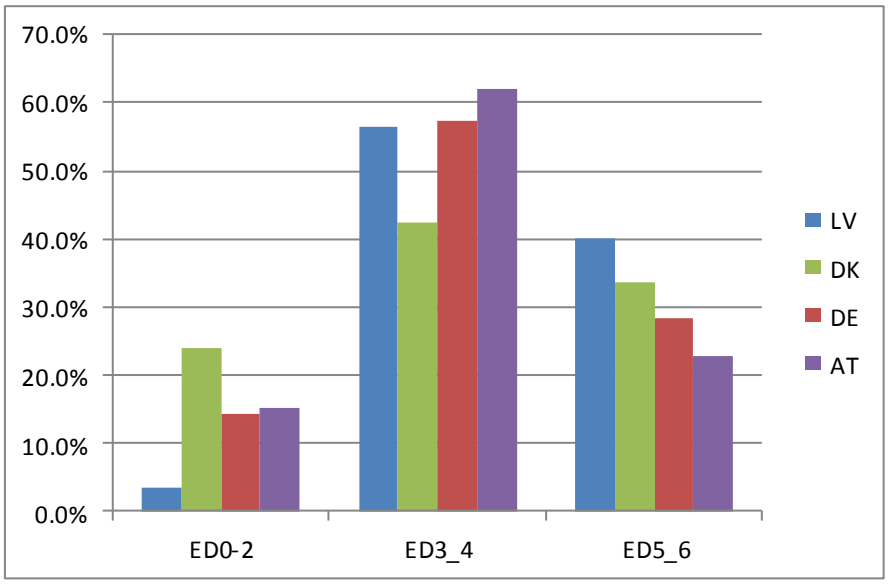

Fig. 5.11. Distribution of employees by education levels (ISCED97) in sectors of art, entertainment and recreation, other services, operations of households – employers, operations of non-territorial organizations and institutions (R-U) (NACE2 code R-U) in 2011[146]

The demand for qualified employees in art, entertainment and recreation sectors (NACE 2 code R) will increase in the future therefore there could be a tendency that employees with general education will be replaced by employees who have definite skills and who have attained secondary vocational education in any specific art, entertainment and culture related field (environment, design, cloth design etc.) in order to perform specific tasks and by using simple regulations and tools to address instant problems. Similar tendencies could also be observed in other service industries (NACE 2 code S) and operations by households-employers. The demand for elementary occupations (cleaners, auxiliary workers) and employees with the basic skills necessary to perform simple tasks in these occupations will remain constant. Now 14% of all the employed in low-qualified occupations work in the sectors of art, entertainment and recreation, other services, operations of households-employers, operations of non-territorial organizations and institutions (R-U) and in the future the figure could slightly increase.

The examination of the current distribution of employees by occupations suggests an explicit tendency of the prevalence of the employees of individual service fields (OC51) who compose one fourth of all the occupied working places. Among the most demanded occupations there are beauty specialists who constitute 25% of the employed in this occupational group and producers of textiles, cloth, footwear and leather wares that constitute 7% of the employed. Employees with the education in fields of management and administration as well as accounting and taxes are also demanded. Specialists of legal, social and culture affairs (OC26 and OC34) prevail in the group of specialists where one sixth deal with music and dramatic art, and also specialists of health care field (OC22 and OC32). Taking into account the tendencies that have so far taken place in the benchmark countries the demand for various kinds of specialists with the tertiary education level will increase in the future because now their proportion among the employed in sectors of art, entertainment and recreation, other services, operations of households-employers, operations of non-territorial organizations and institutions (R-U) and in other

[146] Figure made by authors using Labour Force Survey data and Eurostat database.

economy sectors is comparatively low. The demand for the specialists with comprehensive cognitive and practical skills necessary for finding creative solutions for abstract problems will increase.

Having regard of the said before we may conclude that in Latvia the following tendencies prevail in the sectors of art, entertainment and recreation, other services, operations of households-employers, operations of non-territorial organizations and institutions (R-U):

- The current contribution of the given sectors to the economy is not high, around 5% of all the employed in the economy work there and the GDP is 3%, though in the future we may expect the development of these sectors that will mainly be defined by the increase of the welfare level promoting the demand for different entertainment and recreation, beauty and other individual services.
- The proportion of the employed with the tertiary education level is high in Latvia comparing to other European countries but the proportion of the employed with the lowest education level is comparatively low. It is expected in the future that the relative demand for the employees with the tertiary education (ISCED5-6) will reduce but the relative demand for the employees with basic education (ISCED0-2) will increase.
- Most demanded education fields currently are beauty services, also music, art and design, library, information and archive sciences, however, in the sectors there is a high proportion of the employed with general education (more than 30% employees have acquired only basic general programmes and they have no special education).
- The demand for qualified employees will increase in art, entertainment and recreation sectors therefore there could be a tendency that workers with general education could be replaced with the workers who have definite skills and who have attained vocational education in any specific art, entertainment and culture related field. Similar tendencies could also take place in the sectors of other services and operations of households-employers though in these occupations the demand for elementary occupations (cleaners, auxiliary workers) and employees with basic skills that are required to perform simple tasks will remain.
- Division of labour force by occupations in the sectors is not even - one fourth of all filled work places are composed by the employees of the personal service field (occupational group OC51) where among the most demanded occupations there are beauty specialists and producers of textiles, cloth, and footwear and leather wares. Employed in low-qualified occupations are 14% of the employed but in the future it could slightly increase.
- More than 40% of the occupied working places in 2011 were in highly qualified occupations (managers, senior specialists and specialists) where the specialists of legal, social and culture affairs (OC26 and OC34) prevail as well as specialists of the health care field (occupational groups OC22 and OC32). Majority of employees with high qualification have also acquired their education in the relevant field (music and dramatic art, medicine, library, information and archive sciences).

The general trends of skills demanded in different sectors until 2030 and factors defining these changes are presented in Appendix 12.

5.3.2. Changes in the structure of skills' demand in alternative scenarios and factors determining the formation of a new skills' demand

As noted in the analysis of the demand trends by sectors (see Appendix 12) the major demand shifts until 2030 are anticipated in the sectors of services that comply with the common tendencies in European and other countries of the world. Moreover, the demand for managers and also different specialists (OC1, 2 and 3) requiring the corresponding education (5^{th} –6^{th} level according to ISCED97 classification) will increase. Likewise, the employees of elementary occupations (OC9) and qualified workers (OC6 and 7) will continue to be in demand. The demand is expected to decrease for occupational group OC5 that will be basically defined by the overall development tendencies of the sector (reduction of the GDP proportion). The proportion of the employed with secondary and lower than secondary education will reduce in Latvia until 2030 while proportion of the employed with the education higher than secondary with the abilities to communicate, take decisions independently and perform complex tasks will grow. Also, the surveyed economy experts confirm that they anticipate that the demand will increase for educated specialists of all sectors, in the medium term – also for the employees with vocational secondary education while the demand for low-qualified employees will reduce that will be defined by steadily increasing automatization. Also, according to the forecasts by experts the demand will increase for technical specialists, engineers, programmers and other specialists in information and communication technologies. Also, specialists in health care, social welfare and pharmacy will be required.

Recognizing the favoured economy structure developed by the authors as well as the alternative economic development scenarios, changes are also forecast in the structure of the skills demanded in the period until year 2030 (by education and occupation sub-groups) that are presented in Table 5.6.

Table 5.6. Changes in the structure of skils' demand (comparing to the current) in Latvia until 2030 by different groups of occupations and alternative economic development scenarios

GROUP OF OCCUPATIONS	DYNAMIC GROWTH SCENARIO	MODERATE GROWTH SCENARIO	SLOW GROWTH SCENARIO
OC1	Increase	Increase	Reduce
OC2	Increase	Constant	Reduce
OC3	Increase	Constant	Constant
OC4	Reduce	Reduce	Increase
OC5	Considerably reduce	Reduce	Constant
OC6	Reduce	Reduce	Constant
OC7	Reduce	Constant	Increase
OC8	Reduce	Constant	Constant
OC9	Constant	Slightly reduce	Increase

In the case of dynamic growth there are substantial shifts forecast in the structure of the most substantial demanded skills that according to assumptions will be defined by a rapid productivity increase as a result of restructuring the economy to high added value sectors and strong cooperation among EU countries. In the case of moderate growth there could be slight changes in the demand of skills – the demand tends to increase for managers and reduce for clerks and qualified specialists that could be explained by the reduced necessity of different routine work performers due to technological development. Also, in the

case of slow growth, shifts are forecast in the structure of the demanded skills if the restructuring of the economy of Latvia toward high added value sectors does not take place and mutual cooperation among the EU countries is not successful due to the protracted crisis of debts and other problems. In this situation the demand for managers and senior specialists would decrease while the demand for the employed in occupational groups OC7 and OC9 would increase because of the poor technological progress and productivity increase. It could also have a negative impact on the division of the demanded skills in terms of education by increasing the demand for employees with the basic education and reducing the demand for specialists with a tertiary education (see Table 5.7.).

Table 5.7. Changes in the structure of skills' demand (comparing to the current) in Latvia until 2030 by education levels and alternative economic development scenarios

EDUCATION LEVEL	DYNAMIC GROWTH SCENARIO	MODERATE GROWTH SCENARIO	SLOW GROWTH SCENARIO
ISCED 0-2	Reduce	Reduce	Increase
ISCED 3-4	Reduce	Constant	Increase
ISCED 5-6	Increase	Increase	Reduce

However, in the cases of dynamic and moderate growth there will be adverse tendencies – the demand will increase for the specialists with a tertiary education and reduce for the specialists with the basic and general secondary education. Likewise, under different development scenarios may lead to different distributions of the demanded skills by education fields that are illustrated in Table 5.8.

Table 5.8. Changes of skills' demand (comparing to the current) in Latvia until 2030 by education fields and alternative economic development scenarios

EDUCATION FIELD	DYNAMIC GROWTH SCENARIO	MODERATE GROWTH SCENARIO	SLOW GROWTH SCENARIO
Education	Increase	Constant	Reduce
Humanitarian sciences and art	Reduce	Constant	Reduce
Social sciences, business and legal sciences	Reduce	Increase	Constant
Natural sciences, mathematics and information technologies (IT)	Increase	Increase	Constant
Engineering, production and construction	Increase	Increase	Constant
Agriculture	Reduce	Reduce	Constant
Health care and social welfare	Increase	Increase	Increase
Services	Reduce	Reduce	Constant

In the case of slow growth the development of economy will be basically defined by the growth of the sectors based on local resources (agriculture, wood-processing, food production etc.) and, as a result, the demand will remain stable for the specialists of agriculture and various services with comparatively

elementary skills (with secondary, vocational and occupational education level). In all three scenarios it is forecast that the demand will increase for health care and social welfare specialists that will be defined by the demographic factors (society ageing) and shifts in the general welfare level which in the case of dynamic growth will create the demand for new health care and social welfare related services, but in the case of slow growth, along with the increase of the inequality of income distribution and the prevalence of poverty as well as deteriorating health condition among individual population groups the necessity will increase for social assistance and care. In the case of dynamic growth there will be a considerable increase in the specialists of natural sciences, mathematics and IT, also engineers and different production and construction sector specialists whose preparation until 2030 in Latvia could be problematic since ever less young people choose to study in these fields despite the fact that additional financing (budget places) have been allocated during recent years. It may result in a shortage of the said specialists in Latvia.

Until 2030 in Latvia, like in other countries of the world, changes are forecast in the structure of economy which will be defined by the development of technologies and increase in labour productivity, globalization, intensification of competition and other factors incl. the demographic situation.

As a result, there are shifts expected also in the demand for skills that will have an impact on the development of new skills. In the future the demand will increase for qualified employees with the appropriate education level who can both work in a team (with good communication and cooperation skills) as well as plan and organize work, use various methods and technologies (including information and communication technologies), independently take decisions in non-standard situations and offer creative solutions. Knowledge of languages will also be of great importance to be able to communicate in at least two languages and have the ability to find, assess and use information in a creative way that is required for the performance of training or professional work tasks and problem solutions. Employees will have to learn and develop professionally on a constant basis to acquire different new skills in swiftly changing circumstances. It relates to the employed in all sectors but especially to those related to:

- Financial and insurance operations;
- Professional, scientific and technical services;
- Sector of information and communication services;
- Media;
- State administration and security.

Likewise, the technological progress will define the development of new demanded skills for the production sector and construction where employees will need skills to work with the new devices, “smart” vehicles and tools and materials.

Along with the increase of the general education level and proportion of population with higher education (ED5-6) the demand will increase for the employees who are able to demonstrate comprehensive and specialized facts, theories, regularity and technologies based knowledge appropriate to the professional field and understanding of professional problems to find relevant solutions in various situations, debate and justly discuss practical issues and solutions in the occupation with colleagues, customers and managers.

In the long term high demand will be relevant for the management skills that are a successful base for the sustainable development of business. It is defined by global changes in the industrial and services sector of the world which requires an ever increasing role of managers and high level researchers in promoting innovations[147]. The surveyed foreign experts noted that inter-disciplinary and international quality experts in technologies and science will be necessary in the future. Dynamic business people with developed skills in management and creativity, people with entrepreneurship skills, leaders. The ability to communicate, make things, develop an enterprise policy for the next 10-20 years, produce changes, make decisions will be important in business. Specific skills that will be related to the latest products in the market will develop. Also, highly qualified labour force will be necessary who can offer complex solutions. Fewer technicians, more philosophers who see the problem and think how to solve it. New skills will develop for engineers and other technical specialists as vehicles will become more intelligent, complex, demanding towards the user, will require more intellectual abilities from the user – these skills will be very advanced. People have to be ready for more diverse challenges that just learning how to use technologies. Everybody will need to have good social and organizational skills, mutual communication abilities, the ability to address problems, react to changing market circumstances. Language proficiency (at least 2-3 languages in addition to the native one, including the languages of Asian countries) and international work skills (ability to work in other countries, exchange with employees from other countries, work in an international business environment, understanding of different business cultures) will be important. Good knowledge of technologies will be necessary in any sector. In each sector increasingly more specific knowledge and additional skills will be required from employees. Employees will need to be more flexible and mobile. The ability to change and develop will be substantial as there will be no work for life. The necessity to acquire intersectoral knowledge will increase even more. High demands will also be set to low-qualified labour force. The ability to learn will be improved and made important – every person will need to develop the ability to learn continuously. Each employee will need to have a diversity of skills. Narrow specialization will lose relevance; the demand for employees with more universal skills who can be trained and retrained will increase. Different new "green skills" will develop that are necessary to work in an environment-friendly manner and with "green" technologies.

To sum up the views of foreign experts on the development of new skills several groups of skills may be distinguished:

- new skills related to the development and use of technologies;
- new language skills, ability to communicate in 2-3 foreign languages including the knowledge of Asian languages;
- skills that improve labour force flexibility and mobility;
- skills for work in international market, multinational, multicultural environment;
- skills related to management and organization;
- new communication, mutual communication and other non-quantifiable ("soft") skills (unlike robots and automatization);
- skills related to "green economy" sectors.

147 Building the new leader. Leadership challenges of the future revealed. – Hay group 2011.

The demand for skills in Latvia will also depend on the increasing entrepreneurship and international integration level – it will create the demand for qualified labour force and development of skills among managers, legislators and professionals.

Thereby the development of new skills in Latvia in the long term will be closely related to the development of the global economy and necessity for the improvement of the present labour force qualifications (skills and abilities). It means that the "old" working places in terms of the content of tasks to be performed in the long term will adapt to the global technological progress.

Consequently, the demand for skills of elementary occupations (OC9) in the future will also involve a higher level of communication, language and literacy. Also, computer skills and skills of using other communication devices widely applied in everyday situations will be necessary. Likewise, the skills to work with different technological equipment will be required.

The range of skills necessary for qualified workers (OC6; OC7) will increase along with the technical progress – for example, new knowledge about the methods used at work and their application in producing agriculture, hunting, fishery products as well as about the use of new methods and equipment in the manufacturing industry and construction.

In the future the demand for communication and argumentation skills, also computer, language and other skills will increase for the employees working in trade (OC5).

Among clerks (OC4) the demand will increase for language, communication, argumentation skills, the use of new methods, ability to summarize information etc.

Among associate professionals (OC3) in the future there will be a substantial increase in the demand for the skills for using the latest methods in science, trade, finance and similar sectors.

Among professionals (OC2) there will a considerable increase in the demand for skills for managing fundamental scientific studies, interpretation of research and results, skills that are necessary to plan economic development, prepare development and legal acts and the like (languages, communication etc.).

Among managers (OC1) a demand in the future will increase for high level management skills – at both state administration and business. Along with language, communication and argumentation skills there will be an increase in the demand for leaders and team managers, generating conceptions and visions.

CONCLUSIONS

As a result of the research the following **conclusions** were made:

1. After the accession to the EU the demand for labour in Latvia can be considered extensive – the employers, disregarding the negative demographic forecasts, have been focused on extensive, rather than intensive (raising of productivity) use of resources which did not facilitate the sense of justice among the employees about the adequacy of the remuneration to their qualifications and sense of job security; as a result the rise of the labour force quality and, consequently, the rise in the competitiveness of the local labour force, was not facilitated.
2. The relieved labour mobility regulations within the EU, the significant difference between the income in elementary occupations in the developed European countries and Latvia were the factors that promoted the emigration of the workers of elementary occupations as well as emigration of the representatives of other occupations and led to the excess demand for labour (insufficiency of labour force). After 2008 the situation changed – as a result of the economic crisis the demand for labour decreased, there was a steep rise of unemployment, salaries decreased, employees became more flexible and willing to assume the jobs they did not accept before.
3. In the labour market of Latvia there is a high proportion of workers with general education which decreases the productivity and competitiveness of labour and is an obstructive factor for the development of industries and economy as a whole.
4. Over the recent decade in Latvia the demand has increased for various professionals, however, the demand for clerks, qualified agriculture and fishing workers as well as mining and construction workers has decreased. There is a comparatively stable demand for various elementary occupations as well as machinery and equipment operators.
5. In the labour market of Latvia the most demanded occupational groups are corporate managers (group OC1, 2) and various professionals and associate professionals (groups OC24 and 34) which need leadership and management skills, political and organizational skills as well as the employees in various elementary occupations who need social and technical skills.
6. Currently the labour market of Latvia is dominated by the demand for the labour force with tertiary education which suggests qualitative development of the labour market facilitated by the technological development of industries and international competition of enterprises (proved by the drop in the demand for the labour force with a low education level).
7. The demand for labour differs within various age groups – the most demanded are the employees in age brackets 25–34, 35–44 and 44–54. The proportions of these groups among the employed persons can be considered equal. The trend has been stable for the recent decade.
8. The demand for skills in Latvia has been determined by the following factors: economic growth (GDP growth) rate, structural reforms, economic structure by sectors, EU policy and the administration of the EU support funds, technological development, drop in the labour costs and manufacturing capitalization, labour productivity.
9. The analysis for the demand structure **abroad** indicates the following trends:
   - The determinant factor in the demand for labour in Europe is the economic structure. In the recent decade the changes in the structure have led to the drop in the demand for labour in such sectors as agriculture, fishing and forestry as well as manufacturing and to the rise in

the demand for various specialists in service industries. This has also been confirmed by the growth of the added value created by the service sector both in the world as a whole as well as individual regions (in 2010 the global added value of the service sector had grown by 78% compared to year 1990).

- The changes in the demand for labour in Europe were influenced by the fast development of technologies which promoted the growth in the demand for the employees with a higher level of education in all sectors of economy;
- In the EU the demand is increasing for qualified labour, jobs have become more specialized and more specific employee qualifications are needed than before. The demand has increased for the medium and highest level specialists, however, the demand for low qualification workers has decreased;
- In all European countries the demand for clerks (OC4) and qualified workers (OC6, 7, 8) has been decreasing) which is connected with the decrease in the proportion of the manufacturing sector industries in the economy as well as with the technological process which leads to the substitution of many elementary routine jobs with automatized operations;
- The shifts in the demand for labour in Europe were influenced by the global economic crisis which led to the decreasing of the demand for labour in all European countries, the decrease was particularly rapid in the Baltic countries and Ireland. As a result of the crisis the structure of the demand for labour changed – the demand for the elementary occupations decreased and the demand for the senior professionals increased;
- All over the EU the specialists are needed in ICT occupations, engineers, technical workers in many industries and for particularly trained employees. In the majority of countries there is a lack of employees in the health and social care sector – both doctors and nurses as well as other care staff;
- Like in Europe, the employment structure across economic sectors has changed in Japan as a result of the drop of employment in agriculture, fishing, forestry, manufacturing and construction sectors;
- The biggest number of employees by occupational groups in Japan have been concentrated for the maintenance of the industrial process – in the processing industry, construction as well as service sector – clerks, public servants and technical staff;
- In the USA, unlike Europe and Japan, there is a higher level of employment and better population age structure, however, the number of population between 18 years of age has been decreasing there as well which may lead to the lack of workforce in the future.
- In the USA, like in Japan and Europe, structural changes can be observed in the labour market – the demand is decreasing for the workers in the manufacturing sector, especially in the industries the produce of which does not stand the competition with the Asian import goods as well as in the industries where rapid technological changes are taking place;

10. The comparison of the skills demanded in Latvia and abroad suggests that:
    - In Latvia the demand for the professionals (groups OC1-3) is slightly different from the average trend of the countries of the European Community, as well as the trends in Denmark, Finland and Sweden (where it is much higher), but closer to the trends demonstrated by Italy and Austria (both in terms of the number of employees as well as the changes);

- The clerk and qualified worker (groups OC4, 6, 7, 8) demand trends in Latvia are similar to other European countries, however, if the demand per 1000 employed persons is compared, in Latvia it is higher than in Denmark, Finland and Sweden and more corresponds to the level of Austria and Italy;
- In Latvia the demand for the service and trade workers (group OC5) has been fluctuating, however, generally the demand for the specialists of this field is growing, as it is in other European countries;
- The demand for elementary occupations (OC9) in Latvia corresponds to the general trend in European countries, it is however higher than the EC average and more similar to the demand trends in the Southern Europe (Spain and Portugal).

11. Over recent two decades the differences in the demand for skills in Latvia and other countries have been determined by the unlike economic development dynamics and structure (in Latvia the transition to market economy has been taking place – as a result over less than twenty years a radical change has taken place in its economic structure, which was facilitated by the integration of the country in the EU as well as accumulative globalization processes, thus at the beginning of the 21st century the economic structure of Latvia became similar to that of the EU and its biggest developed countries) as well as the different levels of technological development and productivity.
12. For the assessment of the development alternatives of the Latvian economy the authors used the method of the favoured/unfavoured scenarios and identified two key development axis or critical choices:

    1) Horizontal (external factor determined) axis, which reflects the further development of the EU and strength of the mutual integration of the EU countries (the ability or disability to cope successfully with the challenges the European Union will face in the nearest two decades);

    2) Vertical axis (internal factor determined) reflects the structure of the Latvian economy and the improvement and balance of the labour market (connected with the structural changes in the Latvian economy aimed at higher added value sectors and a significant rise of labour efficiency).

    Based on these assumptions the scenario matrix was designed with four possible development scenarios and GDP growth projections were elaborated which corresponded to various development scenarios.
13. In order to be able to refer to real and comparable examples in the further forecasting of skills the benchmark countries were established which best characterize each of the scenarios. In the selection of the benchmark countries the EU countries were grouped according to the distribution of economic sectors (proportion of sectors in their added value) in years 2000 to 2010 by using the method of cluster analysis. As a result of the cluster analysis the countries were divided into 5 natural groups (clusters). By analysing the compliance of the group with the previously designed scenarios it was concluded that:
    - Under the dynamic development scenario the countries like Denmark, Finland and Sweden could serve as a benchmark which differ most from Latvia by the size of their GDP per capita as well as their economic structure, however, all of them are located in the same region and have a similar economic development history;

- Under the moderate growth scenario the benchmark countries could be Germany, Ireland, Czech Republic or Austria, Italy and Slovenia the current economic structure of which is the most similar to Latvia, but with a higher added value.

14. Based on the designed scenarios and selected benchmark countries the favoured (or optimal) economic structure of Latvia as to year 2030 was designed. The favoured economic structure was created by assessing the current industry structure of Latvia and its changes over recent 20 years, by assessing the change trends in the EU15 countries, by analysing the economic structure of the benchmark countries and taking into account the programming documents designed in Latvia and the EU and the priorities set by them as well as by following foreign research on balanced economic structures.
15. As a result of assessing the key trends in the demand for skills in Europe and other countries it was found that until year 2030 the following trends will be observed:
    - In the future globalization trends will have a significant influence on the labour market – the rise of the competition between the developed and development countries which will lead to the changes in the supply of labour (in Europe and other developed countries the proportion of elderly labour force will increase, however, in the developing markets the opposite trends will take place);
    - The demand for labour will be influenced by the climate change trends and development of the related industries all over the world – the number of jobs will increase in the renewable energy sectors and decrease in the industries which use fossil energy resources.
    - Until 2030 in Europe and the world the demand will increase for qualified labour with the skills to deal with a complex set of issues (for the occupations in the group of professionals and managers), which will be determined by the growing productivity facilitating the demand for the labour force with tertiary education; the demand will decrease for the workers in the routine jobs.
    - The demand will rise for such large competences as creativity, communication skills, ability to adjust to change, self-organization, self-education, systematic thinking. Simultaneously, the demand might decrease for the mathematical thinking skills because along with the drop in the routine jobs there will be a decrease in the demand for the ability to perform daily calculations;
    - In the point of contact between the service sector and science a very specific group of persons employed in the provision of technical services has been developing which can have a significant influence on the employment structure as a whole. This marginal sector (e.g., biotechnologies, IT) does not create the product itself, but rather the pre-conditions (technologies) for manufacturing products;
    - The demand will increase for the specialists with the bachelor and master's degrees who have good social skills. If the education continues the concentration on the depth of specialization rather than developing the social and co-operation skills the employees of two kinds will be demanded in knowledge-based enterprises – the ones involved in research and in sales. Hence, the demand will continue to rise for various kinds of professionals as well as employees of services and trade.
    - The demand will decrease for elementary skills necessary for doing physical and routine work. Thus the demand will decrease for the labour with the basic education.

16. Until year 2030 the following trends will be observed in the demand for skills in Latvia:
    - The demand for skills will be determined by shifts in productivity: the rising of productivity both in the manufacturing and service sectors will determine the expansion of the use of manufacturing, communication and similar technologies. Moreover, along with the technological development and change trends in education and labour there will also be changes in the general supply of skills.
    - The biggest changes in the demand expected until 2030 are to take place in the service sector industries which complies with the overall trends in Europe and other countries of the world. The demand will increase for the managers as well as various professionals (groups OC1, 2, 3) who need corresponding education (level 5-6 according to ISCED97 classification); the demand will be stable for elementary occupations (OC9) and qualified workers (groups OC6 and 7), however, the demand will decrease for group OC5 occupations which will mainly be determined by the overall development trends of the sector (drop in the proportion of GDP).
    - The demand for professionals with tertiary education and general tertiary education level skills such as socialization skills, information analysis and interpretation skills will continue to rise.
    - The agriculture sector will experience a competition-driven modernization of economic activity, bigger economic units will develop and as a result the demand for the labour force with elementary skills will decrease in the future and rise for qualified specialists.
    - In the manufacturing sector the drop in the absolute number of employees and rise in productivity are expected. This will facilitate the demand for qualified specialists and decrease the demand for workers in elementary occupations.
    - The expansion of the service sector will generally increase the demand for specialists with communication skills and skills for technology use and application as well as specialists who can independently find solutions and make decisions. The demand for the employees in elementary occupations will decrease in the professions where the labour can be replaced with technologies (for example, in the transport and communications sector), however, in individual service sectors the demand for the employees in elementary occupations will increase in absolute terms, however, decrease in relative terms along with the growing demand for qualified specialists. It could be a topical issue for art, entertainment and recreation as well as hospitality and catering sectors.
17. The sectors with the biggest growth potential in Latvia are as follows: financial sector, all industries comprising research aspects, tourism, trade, transport and logistics services, information technologies, manufacturing (food, wood, machine building, metal processing, pharmaceutical industry); industries related to human capital (education, culture).
18. Until year 2030 in Latvia changes are expected in the sector structure of economy which will be determined by the development of technologies and rising of labour productivity as well as globalization and increasing competition, and other factors such as demographic processes. As a result changes in the demand for skills are expected and development of new skills in the ICT sector, financial and insurance activities, provision of professional, scientific and technical services as well as in public administration and defence. The technological progress will also determine the development of new skills in the manufacturing industries and construction where

employees will have to acquire the skills for working with new equipment, tools, instruments and materials.

19. In the future the development of new skills will be connected with the "green economy" sectors, flexibility and mobility of labour, management and organization, communication, ability to operate in the international market and multinational and multicultural environment, acquisition of new (incl. Asian) languages.
20. Until 2030 in Latvia the biggest changes in the demand for labour and skills are expected in service industries which correspond to the overall trends in Europe and other countries of the world. The demand will increase for the managers as well as various professionals (groups OC1, 2, 3) who need a corresponding education (level 5–6 according to ISCED97 classification); the demand will be stable for elementary occupations (OC9) and qualified workers (groups OC6 and 7), however, the demand will decrease for group OC5 occupations which will mainly be determined by the overall development trends of the sector (drop in the proportion of GDP).
21. In the future in the manager group (OC1) the demand will increase for leadership and team-leader skills as well as the skills for generating concepts and visions. In the group of professionals (OC2) there will be a significant rise for managing fundamental scientific research, interpretation skills of research and results, skills necessary for planning economic development, designing development and legislation acts and similar skills (languages, communication etc.). In the group of specialists (OC3) the demand for the skills of using the latest methods in science, trade, finance and similar areas will increase in the future.
22. In the group of clerks (OC4) the demand will rise for language, communication, argumentation, new method application, information summarizing and similar skills until year 2030. The persons employed in trade (OC5) will face an increased demand for communication, interaction and argumentation skills as well as computer, language and similar skills in the future.
23. The range of skills necessary for qualified workers (OC6 and OC7) will increase in accordance with the technical progress, however, the future demand for skills in the elementary occupations (OC9) will comprise higher level communication, language and literacy skills as well as computer skills.

RECOMMENDATIONS

The following **recommendations** were designed for the labour market policy designers based on the results of the research and acquired conclusions as well as surveys of experts of the economy of Latvia:

1. The previous labour market policy has not facilitated the co-operation between the public administration and business people, consequently, the correspondence between the labour demand and supply has not been planned and measures have not been taken for the integration of the unemployed in the labour market in accordance with the employers' needs. Moreover, the vocational and tertiary education institutions have been preparing specialists disregarding the market needs. In order to change the situation closer co-operation is needed between the involved state institutions (Ministry of Education and Science, Ministry of Economics, State Employment Agency etc.), employers and sector (professional) associations by involving them in the study process and offering the state support in creating internship jobs.
2. The government has to provide for integrated approach and link between the national education policy and industrial policy. In order to achieve that the co-operation is important among the public administration institutions, ministries, mutual co-ordination of actions and focusing on a common aim both in various planning documents as well as in their implementation.
3. The Ministry of Education and Science has to extend a targeted support to raising the competitiveness of education by lifting the restrictions in the tertiary education system regarding studies in English and other official languages of the EU, similarly there must be a more active position on what study programmes should be supported (not only by formally distributing the state-funded study places, but also by providing the study directions with the additional funds necessary for the modernization of study infrastructure, attraction of foreign lecturers, student exchange, internships etc.) in order to prepare more qualified specialists for the future labour market needs.
4. In order to decrease the proportion of the labour force with general education MoES has to develop the vocational education system both on the secondary and tertiary level by making investments in the infrastructure, provide for the development of the study contents and increasing of the prestige of vocational education as well as bigger involvement of employers.
5. In order to facilitate the balanced choice of study programmes among the youth, in the primary and secondary schools better preparation and more interest in mathematics and sciences must be provided, professional orientation of the youth should be promoted and career education introduced.
6. A factor limiting the labour market development in Latvia is the strict labour legislation which is more directed in favour of employers and simultaneously creates additional costs and counter-reaction on the part of employers and promotes illegal employment. The government should revise the need for individual regulations and decrease the administrative requirements, particularly what regards the small and micro enterprises.
7. SEA should facilitate the returning of the long-term unemployed in the labour market as well as pay attention to the youth who have just finished their education or acquired a trade. During the acquisition of a trade the opportunity must be provided to have apprenticeship in enterprises which will be the future employers of the youth.

8. The government should assess the usefulness of the application of the EU funds in the training of the unemployed. Many SEA requalification programmes have not been effective and have been more aimed at the improvement of the people's skills and less at supporting enterprises which can create jobs. Enterprises should be more involved in the training of the unemployed by allocating the support from the EU funds to them with the condition that they hire a certain proportion of the trained people after the training period. Besides, subsidized jobs should be created where a half of the minimum wage is paid by the state and the other half by the employers.
9. In order to raise the conformity between the demand and supply and to facilitate the competitiveness of labour SEA should organize the training system for regular improvement of qualifications and requalification which is connected with the application of new technologies as well as popularize the need for life-long learning.
10. The Ministry of Welfare should revise the social support system to provide that the potential employee cannot receive allowances and stay out of work. The Ministry should think more about active measures which facilitate gaining income, for example, the mobility allowance envisaged for the people to search and start work further from the region of their residence.
11. The Ministry of Economics should continue to work actively on the re-emigration plan by paying particular attention to the persons who have emigrated comparatively recently (up to five years ago) and have not integrated yet by providing them not only with the relocation allowance, but also social guarantees for all family members (health care, education opportunities etc.) and a place of residence in a municipality property (if needed) or relieved borrowing conditions for the acquisition of a real estate (or returning the existing mortgage).
12. The Ministry of Foreign Affairs should maintain contacts with the Latvian citizens who have emigrated in order to demonstrate that they are important and necessary for Latvia which is needed to persuade them to return and to establish remote co-operation by using their potential in favour of Latvia. Efforts should be made to decrease the structural unemployment, particularly in the geographical (regional) cross-section, by attracting employers to less developed regions where free labour resources are available with the help of the employment policy as well as support from local municipalities.
13. The Ministry of Environment Protection and Regional Development should balance the regional development by creating strong regional centres where resources are concentrated and various reliefs offered to business people in order to create interest and new jobs.

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APPENDIXES

Appendix 1

Descriptions of knowledge, skills and competences corresponding to European Qualifications Framework[148]

EQF level	KNOWLEDGE (knowledge and comprehension)	SKILLS (ability to apply knowledge, communication, general skills)	COMPETENCE (analysis, synthesis and assessment)
1.	Ability to demonstrate basic general knowledge by recognizing or remembering.	Ability to use basic skills required to carry out simple tasks under direct supervision, by using simple tools. Ability to do simple tasks which repeat in terms of the contents and are predictable.	Ability to work or study under direct supervision in a structured context. Ability to do simple tasks following a model and to acquire the basics of self-service.
2.	Ability to demonstrate basic factual knowledge of a field of study established in the course programmes.	Ability to use basic cognitive and practical skills required to use relevant information in order to carry out tasks and solve routine problems using simple rules and tools. Ability to understand the consequences of one's actions regarding oneself and others.	Ability to work or study under supervision with some autonomy. Ability to participate in setting the aims of some leaning tasks and in planning operational processes.
3.	Ability to demonstrate the knowledge of facts, principles, processes and general concepts, in a field of work or study. Ability to understand various information on materials, equipment, technologies in the given field of study or work.	Ability to use a range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials, information and technologies.	Ability to take responsibility for completion of tasks in work or study in a constant and stable environment under the supervision of an industry professional. Ability to adapt own behaviour to circumstances in solving problems and take the responsibility for the result.
4.	Ability to demonstrate factual and theoretical knowledge in broad contexts necessary for personal growth and development, civic participation, social integration and continuation of education. Ability to understand in detail and demonstrate diverse knowledge of specific facts, principles, processes and concepts in a certain field of	Ability to plan and organize work by using various methods, technologies (incl. ICT), equipment, tools and materials to generate solutions to specific problems. Ability to find, evaluate and creatively use information for accomplishing tasks and solving problems in the field of study or work. Ability to communicate in at least two languages in writing	Motivation for developing further career and continuation of education, life-long learning in the knowledge-based democratic, multi-lingual and multicultural society in Europe and in the world. Ability to plan and exercise self-management within the guidelines of work or study contexts in the profession individually, in a team or to

148 Amendments in the Cabinet of Ministers Regulation No. 990 of 2 Dec., 2008 "On the classification of Education in Latvia", Cabinet of Ministers Regulation No.931, Riga, 5 Oct., 2010. (Minutes. No.51 §16)

EQF level	KNOWLEDGE (knowledge and comprehension)	SKILLS (ability to apply knowledge, communication, general skills)	COMPETENCE (analysis, synthesis and assessment)
	work or study in standard and non-standard situations. Knowledge of technologies and methods for dealing with the tasks of work and study within the profession.	and orally both in a familiar and unfamiliar context. Ability to work independently in a profession, to study and develop. Ability to co-operate.	lead a team. Ability to take responsibility for the quality and quantity of the results of work or study.
5.	Ability to demonstrate comprehensive, specialised, factual and theoretical knowledge as well as knowledge and understanding of technologies within a field of work or study	Ability, based on an analytical approach, to accomplish practical tasks at work, has a comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems, to discuss and argue practical issues and solutions at work with colleagues, customers and management, to study further with a respective degree of autonomy to develop one's competences. Ability to assess and develop performance of self and others, to work in co-operation with others, to plan and organize work to accomplish concrete tasks at work, to supervise the work activities subjected unpredictable change.	Ability to formulate, describe and analyse practical problems at work, select the necessary information and use it for solving clearly defined problems, to participate in the development of the field and show the understanding of the profession in a larger context.
6.	Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles, a part of the knowledge corresponds to the highest achievement of the respective science or profession. Ability to demonstrate the understanding of the most important concepts and regularities of the field of study or work.	Advanced skills to demonstrate mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study. Ability to formulate and analytically describe the information, problems and solutions of a field of work and study, explain them and argue about them both with specialists and non-specialists. Ability to exercise self-management of learning, to promote the further learning and professional development of self and others demonstrate a scientific approach to problem solution, assume responsibility and	Ability to acquire, select and analyse information independently and use it for adopting decisions and solving problems in the field of study or work, ability to demonstrate professional ethics and assess the effect of one's work activities on the environment and society and to participate in the development of the professional field.

EQF level	KNOWLEDGE (knowledge and comprehension)	SKILLS (ability to apply knowledge, communication, general skills)	COMPETENCE (analysis, synthesis and assessment)
		initiative at work individually, in a team and in supervising the work of others, to adopt decisions and find creative solutions in changing or unclear conditions	
7.	Highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research, critical awareness of knowledge issues in a field and at the interface between different fields	Ability to independently use theory, methods and problem-solving skills for research or art or perform highly qualified professional functions. Ability to explain and argue complicated or systemic aspects of the field of work or study both with specialists and non-specialists Ability to manage independently the improvement of the competences and specialization, to take responsibility for the performance of groups and its analysis, to run a business, to make innovations at work or study, to perform work, research or further study under complicated and unpredictable conditions and, if necessary, change them by using new approaches	Ability to formulate and analyse critically complicated problems at study or work, to substantiate decisions and, if needed, perform additional analysis. Ability to integrate the knowledge of different fields and contribute to creating new knowledge, development of the new methods for research or work, to demonstrate understanding and ethical responsibility for the result of research or work or the possible influence of professional activities on the environment and society
8.	Ability to demonstrate the knowledge and comprehension of the most topical scientific theories, the expertise of the research methodology and modern research methods in the field of science or work and in the interface between various fields	Ability to assess and select appropriate methods for scientific research, has contributed to extending the boundaries of knowledge or has provided a new understanding of the existing knowledge and its application, by accomplishing an original research of a substantial scale a part of which is at the level of internationally quotable publications. Ability to communicate about the field of research (industry) with larger scientific community or society as a whole. Able to raise one's scientific qualifications independently, to implement	Ability, as a result of independent, critical analysis, synthesis and evaluations, to solve significant research or innovation tasks, to formulate independently the research idea, plan, structure and manage large-scale scientific projects, including ones in the international context.

EQF level	KNOWLEDGE (knowledge and comprehension)	SKILLS (ability to apply knowledge, communication, general skills)	COMPETENCE (analysis, synthesis and assessment)
		scientific projects by achieving the results corresponding to the international criteria of the field, to manage research or development tasks in enterprises, institutions and organizations where extensive research knowledge and skills are needed.	

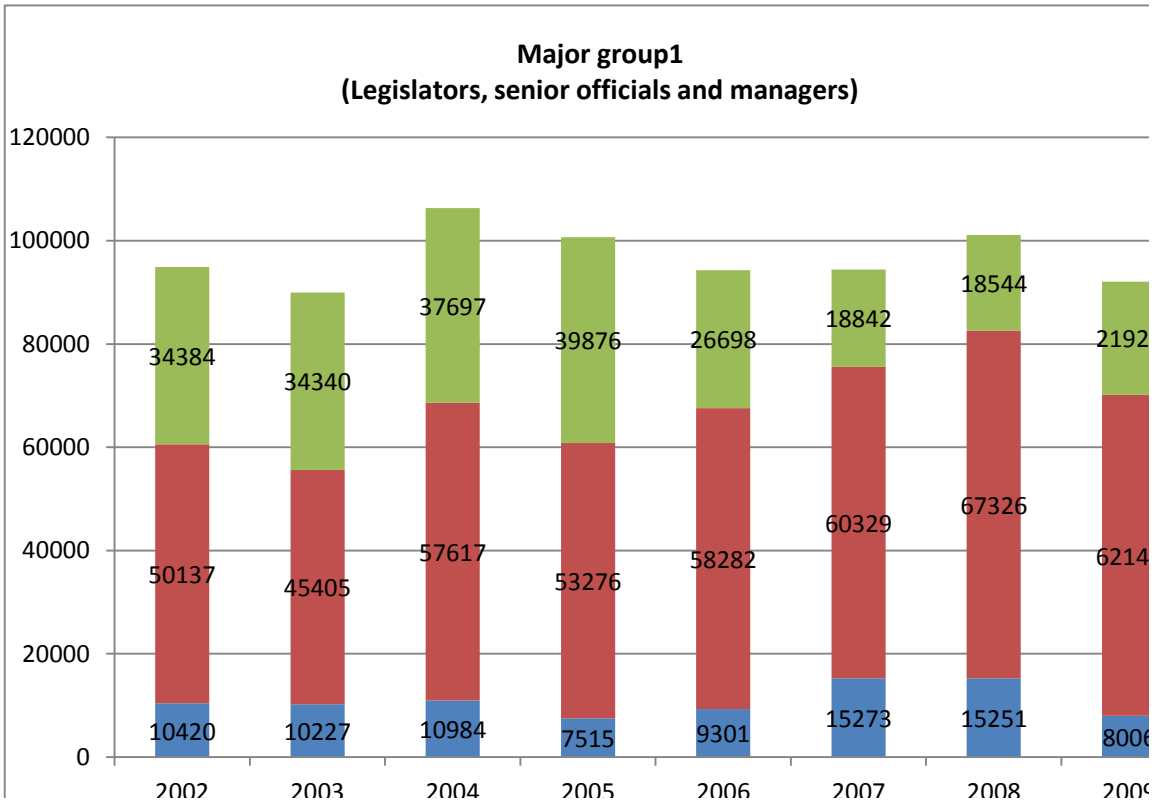
Appendix 2.

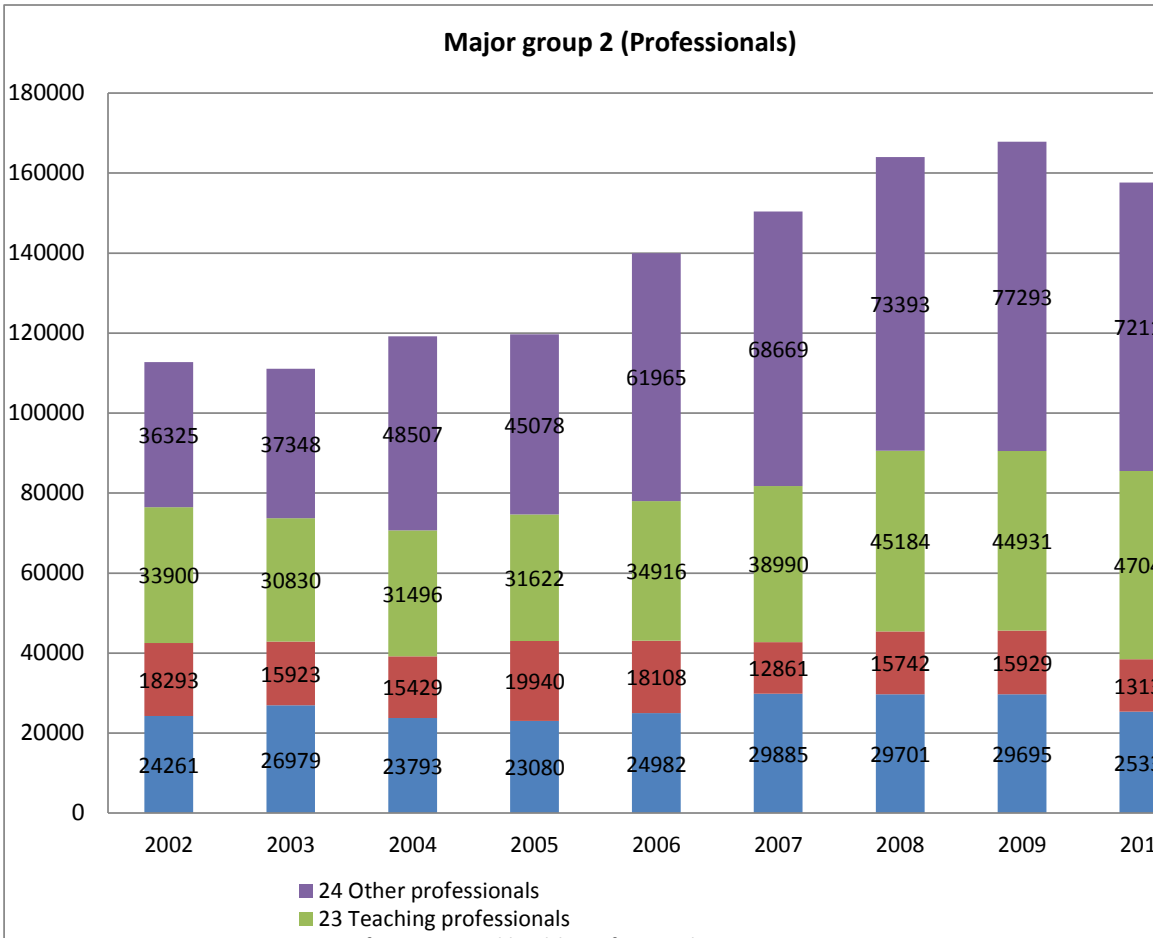
Key indicators of employment and unemployment in Latvia in years 1996–2011[149]

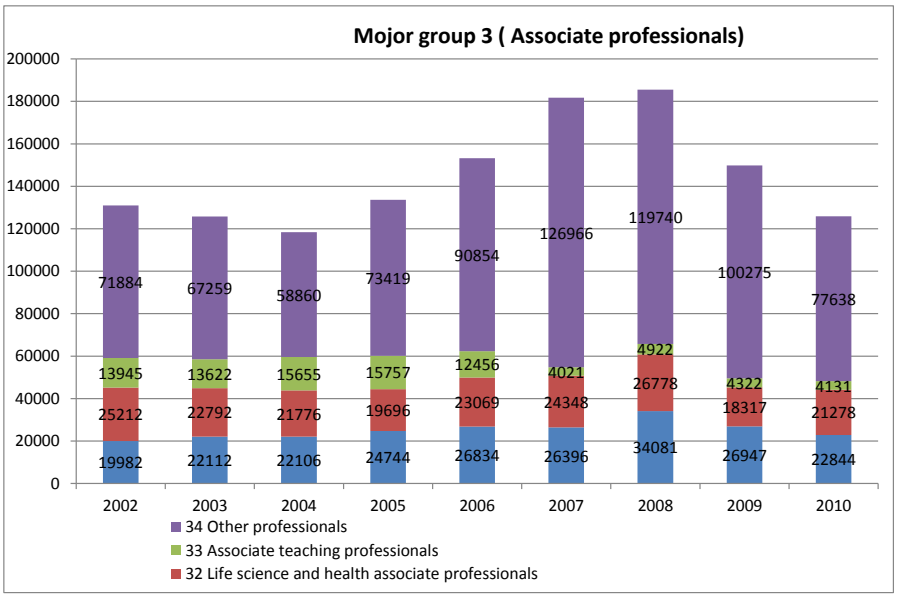
Indicators	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Population in age bracket 15–64 (thds.)	1623.7	1611.4	1601.6	1599.6	1600.2	1594.4	1591.4	1589.3	1587.3	1583.8	1580.4	1573.4	1567.8	1560.1	1549.0	1382.1
Economically active population in age bracket 15–64 (thds.)	1164.4	1134.7	1117.8	1097.9	1074.7	1082.0	1094.8	1099.6	1105.5	1101.3	1126.1	1146.6	1167.5	1152.7	1133.9	1007.4
Number of employed persons (thousand)	952.6	960.2	957.4	939.0	917.6	937.5	962.5	981.5	988.2	1000.9	1047.3	1075.5	1076.2	953.0	918.9	841.8
Level of employment (%)	57.0	59.6	59.8	58.7	57.3	58.8	60.5	61.8	62.3	63.2	66.3	68.4	68.6	61.1	59.3	61.8
Unemployed (searching for job; thousand)	238.8	174.5	160.4	158.9	157.1	144.4	132.3	118.1	117.3	100.5	78.8	71.1	91.3	199.6	215.1	165.6
Level of unemployment (%)	14.7	10.8	10.0	9.9	9.8	9.1	8.3	7.4	7.4	6.3	5.0	4.5	5.8	12.8	13.9	12.0

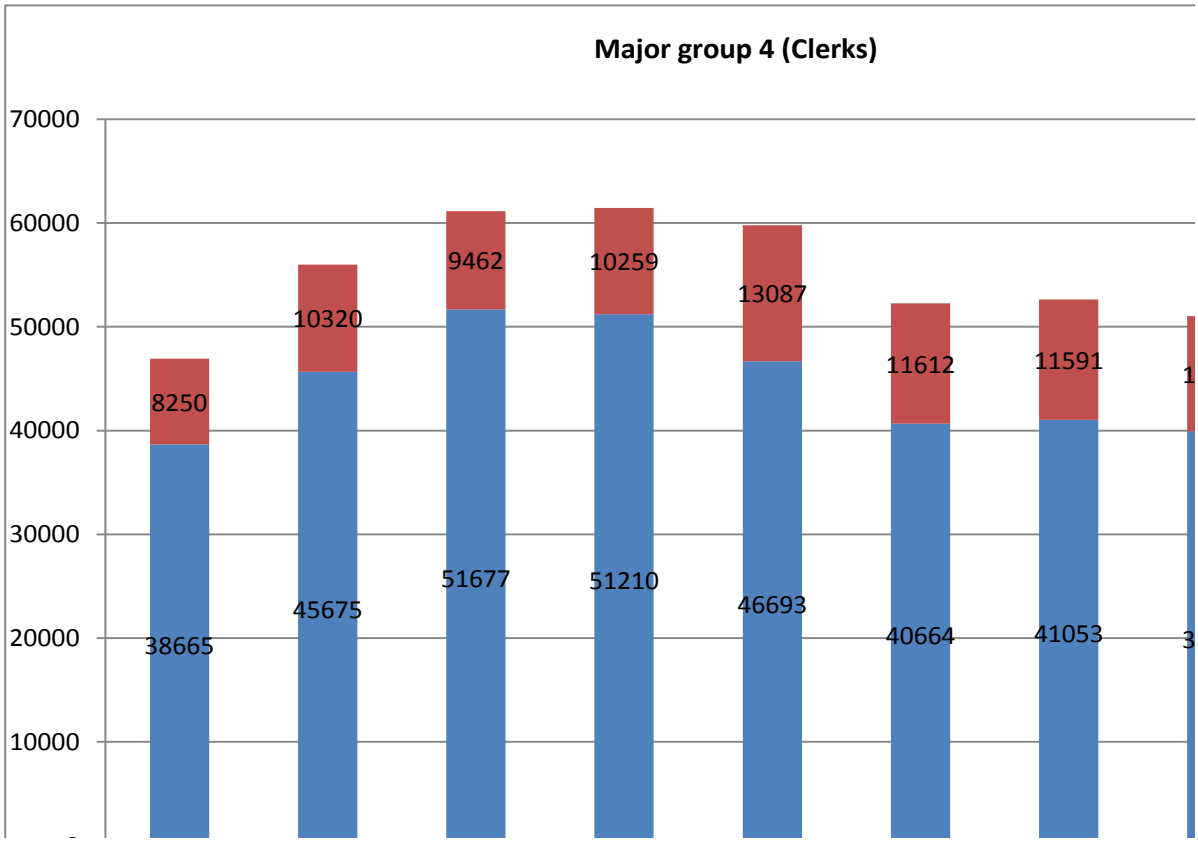
[149] CSB database.

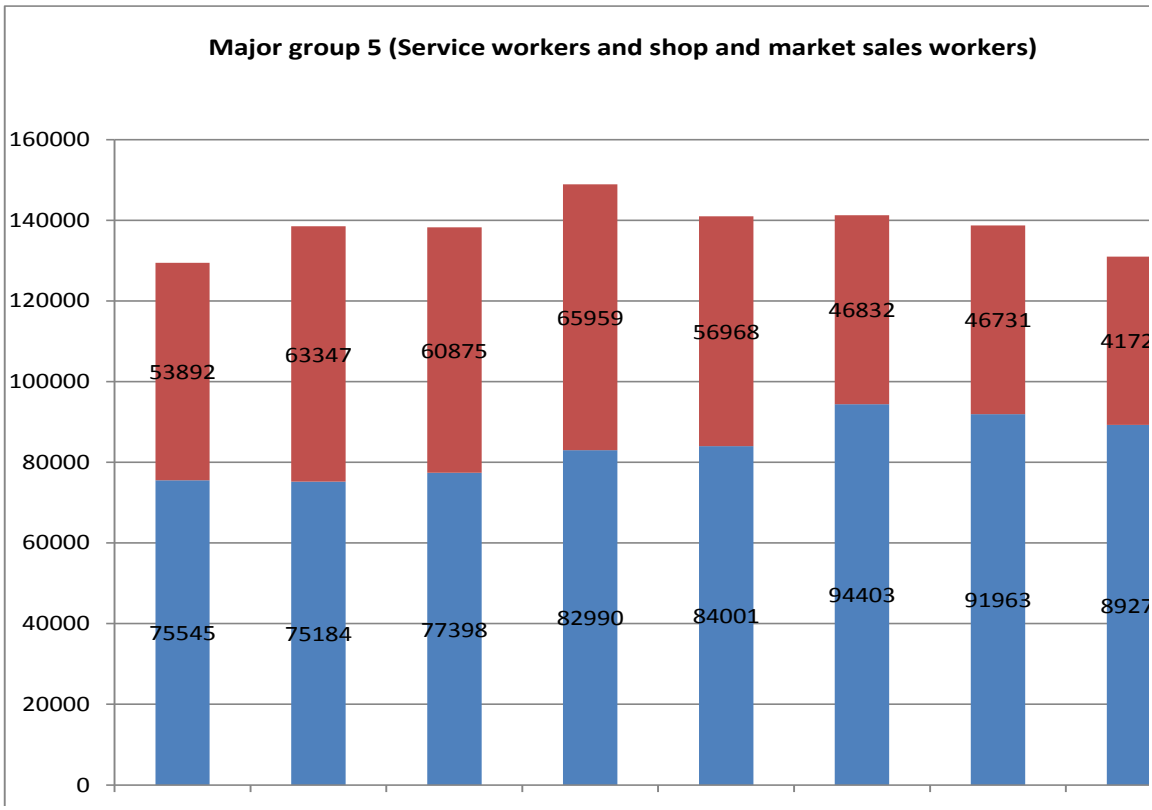
Demand for labour in Latvia in years 2002–2010 (thousand)

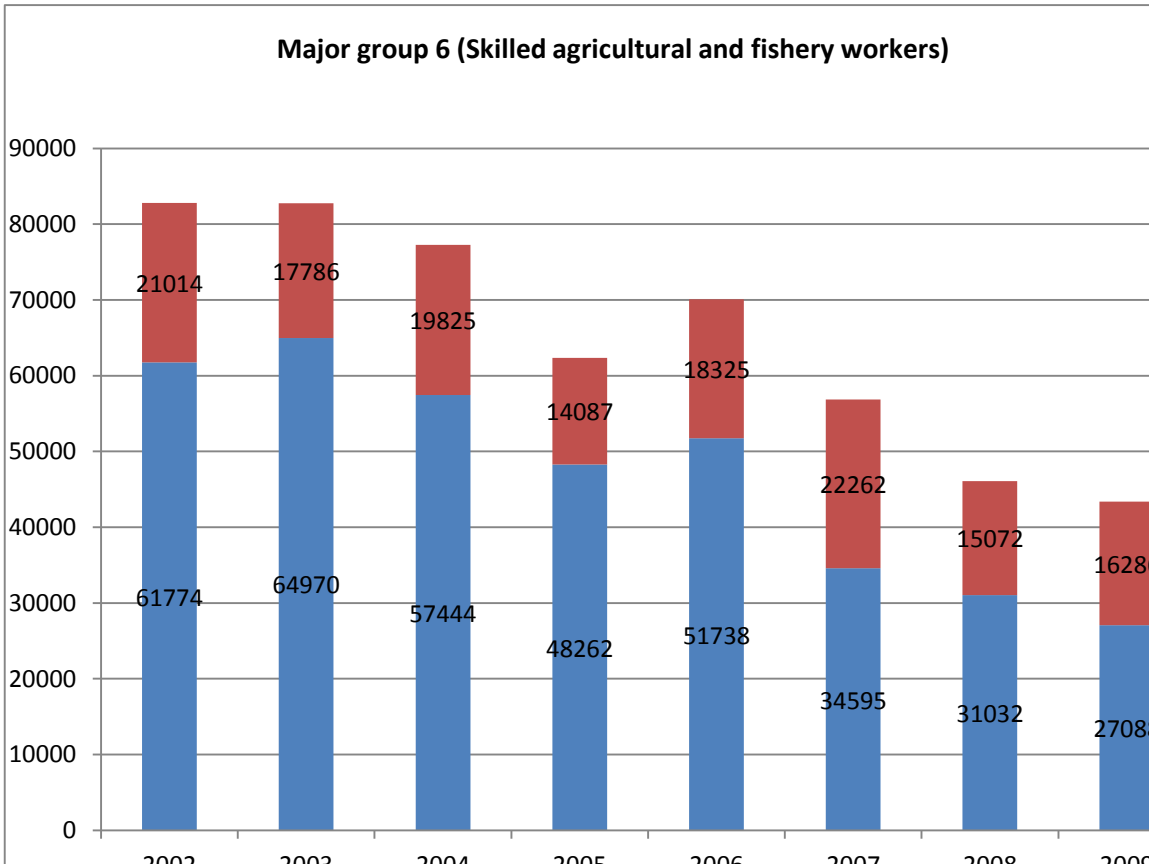


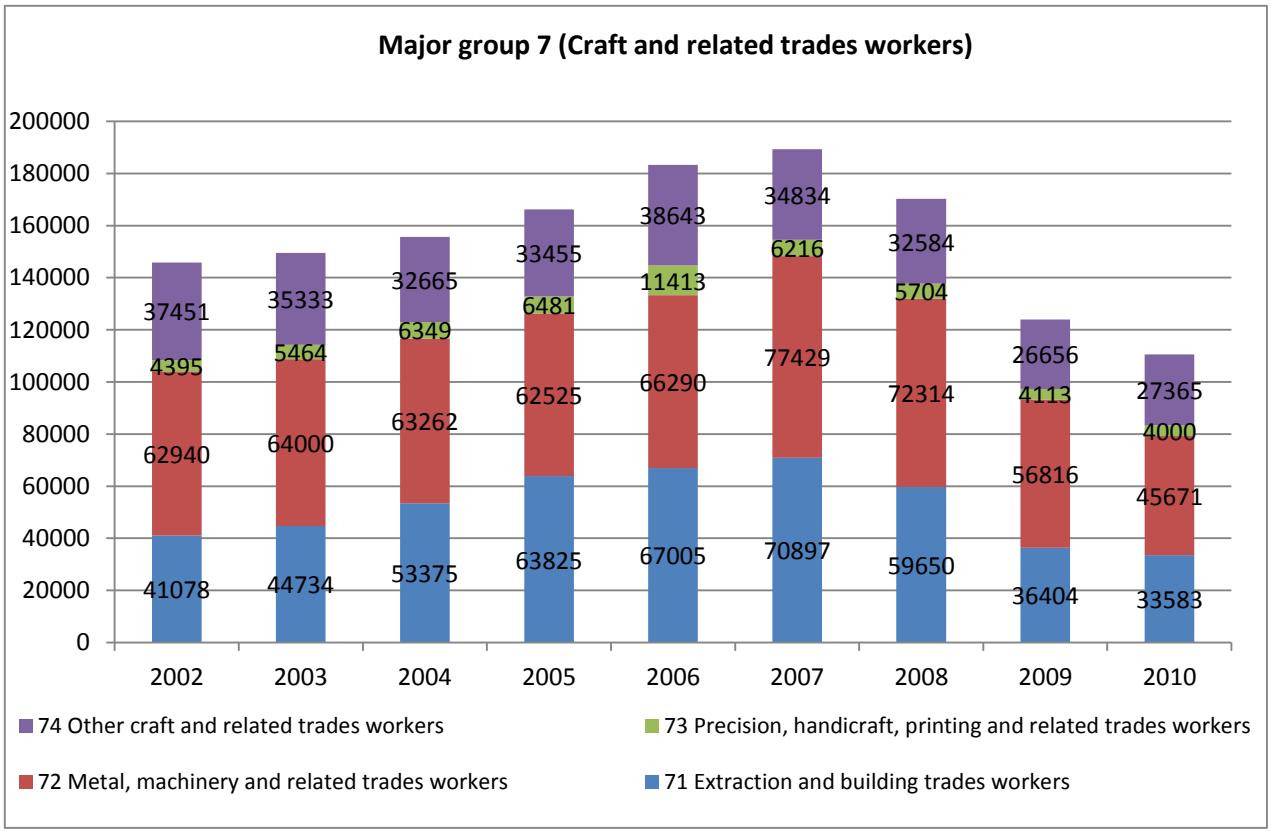


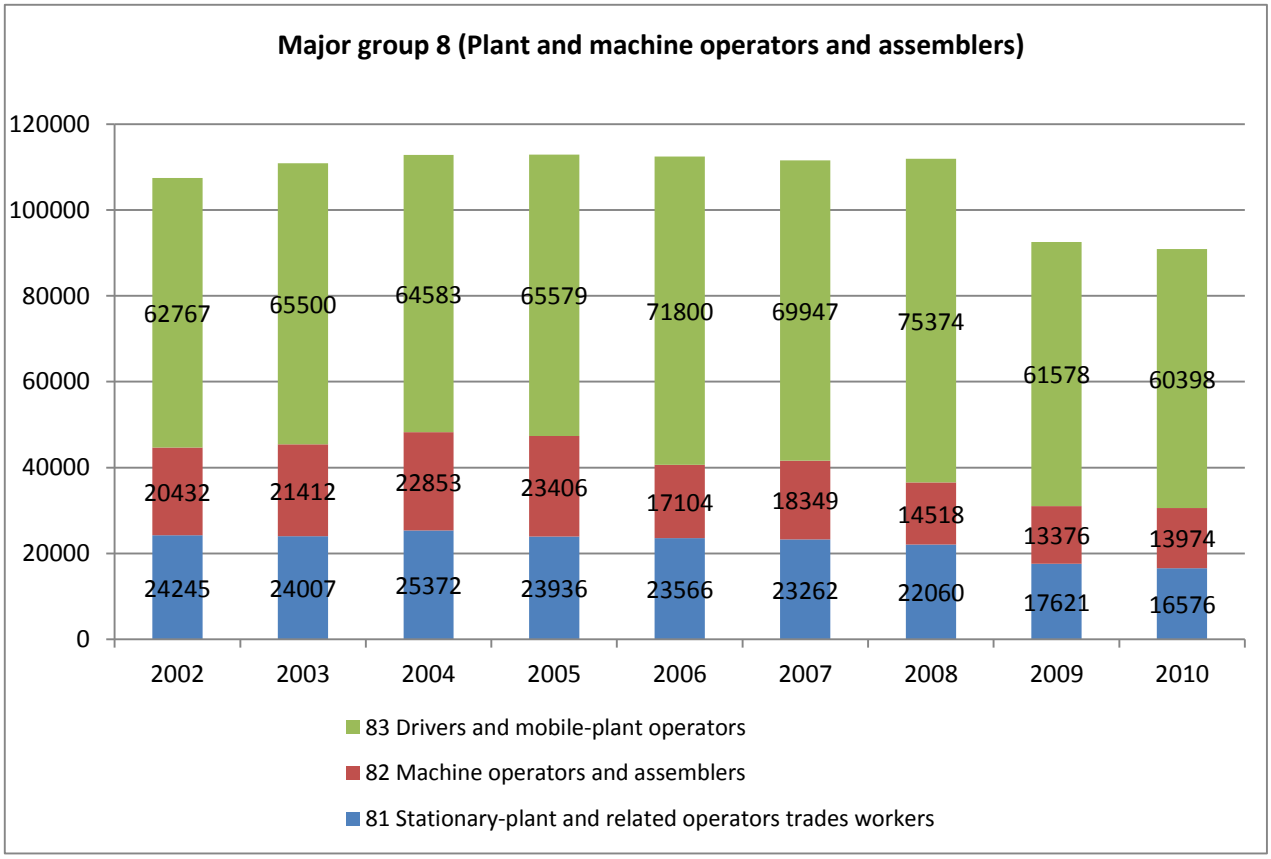

Mojor group 3 (Associate professionals)
200000
180000
160000
140000
120000
100000
80000
60000
40000
20000
0
71884
67259
58860
73419
90854
126966
119740
100275
77638
13945
13622
15655
15757
12456
4021
4922
4322
4131
25212
22792
21776
19696
23069
24348
26778
18317
21278
19982
22112
22106
24744
26834
26396
34081
26947
22844
2002
2003
2004
2005
2006
2007
2008
2009
2010
34 Other professionals
33 Associate teaching professionals
32 Life science and health associate professionals

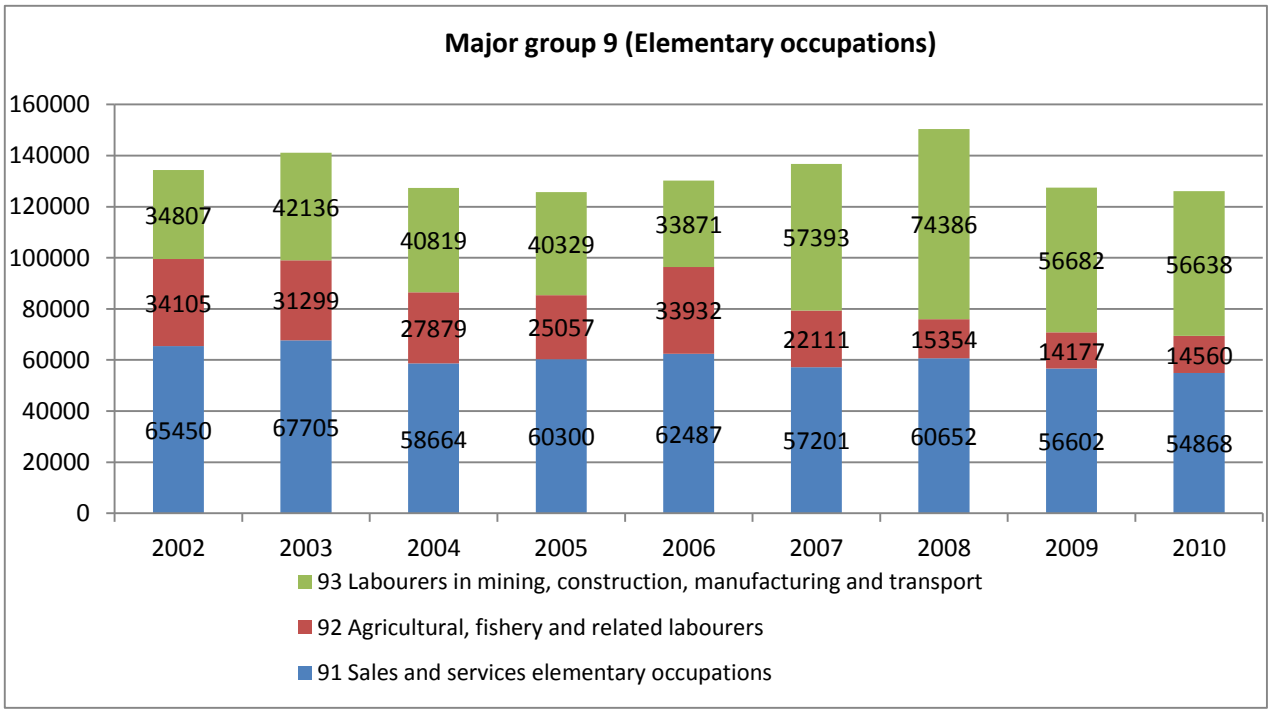

Major group 4 (Clerks)
70000
60000
50000
40000
30000
20000
10000
8250
10320
9462
10259
13087
11612
11591
38665
45675
51677
51210
46693
40664
41053


Major group 5 (Service workers and shop and market sales workers)
160000
140000
120000
100000
80000
60000
40000
20000
0
53892
63347
60875
65959
56968
46832
46731
75545
75184
77398
82990
84001
94403
91963


Major group 6 (Skilled agricultural and fishery workers)
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
21014
17786
19825
14087
18325
22262
15072
61774
64970
57444
48262
51738
34595
31032


Major group 7 (Craft and related trades workers)
200000
180000
160000
140000
120000
100000
80000
60000
40000
20000
0
37451
4395
62940
41078
35333
5464
64000
44734
32665
6349
63262
53375
33455
6481
62525
63825
38643
11413
66290
67005
34834
6216
77429
70897
32584
5704
72314
59650
26656
4113
56816
36404
27365
4000
45671
33583
2002
2003
2004
2005
2006
2007
2008
2009
2010
74 Other craft and related trades workers
73 Precision, handicraft, printing and related trades workers
72 Metal, machinery and related trades workers
71 Extraction and building trades workers


Major group 8 (Plant and machine operators and assemblers)
120000
100000
80000
60000
40000
20000
0
62767
20432
24245
65500
21412
24007
64583
22853
25372
65579
23406
23936
71800
17104
23566
69947
18349
23262
75374
14518
22060
61578
13376
17621
60398
13974
16576
2002
2003
2004
2005
2006
2007
2008
2009
2010
83 Drivers and mobile-plant operators
82 Machine operators and assemblers
81 Stationary-plant and related operators trades workers


Major group 9 (Elementary occupations)
160000
140000
120000
100000
80000
60000
40000
20000
0
34807
42136
40819
40329
33871
57393
74386
56682
56638
34105
31299
27879
25057
33932
22111
15354
14177
14560
65450
67705
58664
60300
62487
57201
60652
56602
54868
2002
2003
2004
2005
2006
2007
2008
2009
2010
93 Labourers in mining, construction, manufacturing and transport
92 Agricultural, fishery and related labourers
91 Sales and services elementary occupations

Appendix 4.

Proportions of GDP of individual economic sectors in countries of EU15 and Latvia in years 2000 and 2010[150]

Sector group	Countries	EU15 2000	EU15 2010	Latvia 2000	Latvia 2010
A	Agriculture, forestry and fishing	2.1	1.5	4.5	4.5
B C D E	Mining and quarrying Manufacturing Electricity, gas, steam and air conditioning supply Water supply; sewerage, waste management and remediation activities	21.7	18.2	18.6	18.7
F	Construction	6.0	6.3	6.8	5.9
G H I	Wholesale and retail trade; repair of motor vehicles and motorcycles Transportation and storage Accommodation and food service activities	19.5	18.8	28.0	30.3
J	Information and communication	4.8	4.7	5.8	4.0
K	Financial and insurance activities	4.9	5.8	3.1	3.7
L	Real estate activities	9.9	10.9	8.0	8.3
M N	Professional, scientific and technical activities Administrative and support service activities	9.8	10.3	5.4	7.3
O P Q	Public administration and defence; compulsory social security Education Human health and social work activities	17.9	19.9	17.0	14.8
R S T U	Arts, entertainment and recreation Other service activities Activities of households as employers; undifferentiated goods and services-producing activities of households for their own use Activities of extraterritorial organisations and bodies	3.4	3.6	2.8	2.5
	Total	**100.0**	**100.0**	**100.0**	**100.0**

[150] Table designed by the authors based on the CSB and Eurostate databases.

Appendix 5.

Assessment of positive and negative aspects of economic development scenarios of Latvia

SCENARIO	POSITIVE ASPECTS	NEGATIVE ASPECTS
E-European Tiger	• Balanced and efficient economic structure • Favourable environment for business development • Educated and skilled labour force • Many small innovative enterprises which rapidly respond to changes in demand • Large investments in science and education from the state and private • Competitive economy	• Fluctuating GDP • Unbalanced distribution of power, big influence of the old and economically strong EU countries on the adoption of decisions • Mutually unbalanced transport infrastructure restricts the development of transport and transit services • Political instability, ethnic and religious conflicts restrict mutual co-operation. • Differences of the economic policy priorities in the countries of the EU • Diversity of currencies and weak trust in your interferes with and delays mutual settlements • Big emigration of labour force to more developed countries • Marked polarization of incomes and stratification of population • Growth in the misbalance between urbanization and regional development • Strong competition from the Nordic countries (Finland, Sweden) as well as biggest countries in the EU (Germany, France, United Kingdom, Poland)
In the spotlights	• The single market and currency of the EU facilitate mutual co-operation and relieve transactions • Common monetary policy and co-ordinated fiscal policy provide for stable and predictable development • Political stability, without ethnic and religious conflicts • Skilled and mobile labour force • High productivity • Rapid and steady GDP growth • Active and innovative enterprises, focused on the use of high technologies Close co-operation between the state and private sector in science and education • High proportion of the use of renewable energy resources • Single culture space provides for extensive development of creative industries	• Comparatively expensive and limited energy and other nature resources • Possibility of high levels of unemployment, particularly among low-qualified population • Different transport infrastructure limits mutual connections and interferes with the flow of transit cargos • Population ageing and low birth rates create big social tension • "Brain-drain" to higher developed regions • Concentration of population and economic activities in the big cities

SCENARIO	POSITIVE ASPECTS	NEGATIVE ASPECTS
	• Diverse service sector, focused on export • Widely accessible range of various e-services both in the state and private sector • Ports and the integrated transport infrastructure provide for good connections among different countries	
In the shadow of the past	• Regional cooperation among the neighbouring countries is developing • Use of the local manufacturing potential • Manufacturing is aimed mainly at the meeting of the domestic demand • Ports and adequate transport infrastructure provide for good connections with Russia and Asia.	• Big influence of the old and economically powerful EU countries on the adoption of decisions • Unfavourable environment for investments and business development • Political instability, ethnic and religious conflicts • Slow GDP growth • Low productivity • Depletion of the environment and local nature resources • Low motivation for raising the qualification level and improvement of skills • High emigration of labour force to other countries • Low intensity of using new technologies
European outskirts	• The single market and currency of the EU facilitate mutual co-operation and relieve transactions • Common monetary policy and co-ordinated fiscal policy provide for stable and predictable development • Adequate transport infrastructure and ports provide for good opportunities for the development of the transport sector and transit services • Political stability, without ethnic or religious conflicts • High demand for labour • More even distribution of the population over the territory of the country • Well-arranged and developed rural infrastructure	• Slow GDP growth • Low productivity and added value • Dependence of foreign capital does not facilitate optimal development of the structure of sectors • Insufficiency of resources and high prices significantly limit economic growth • Low number of innovative enterprises • “Brain drain” and emigration of labour force to higher developed regions

Appendix 6.

Shifts in realistic GDP of Latvia in the case of various GDP projections[151]

		GDP	CHANGES	(%, 2011=100)
GADI	GDP (thds. lats, in relative prices of year 2000)[152]	Dynamic development	Realistic development	Slow development
2000	4716047	66.1	66.1	66.1
2001	5062623	71.0	71.0	71.0
2002	5428371	76.1	76.1	76.1
2003	5840919	81.9	81.9	81.9
2004	6358270	89.1	89.1	89.1
2005	7001924	98.1	98.1	98.1
2006	7782937	109.1	109.1	109.1
2007	8530133	119.6	119.6	119.6
2008	8250733	115.6	115.6	115.6
2009	6787943	95.1	95.1	95.1
2010	6765190	94.8	94.8	94.8
2011	7135197	**100.0**	**100.0**	**100.0**
2012		102.5	102.5	102.5
2013		105.1	105.1	105.1
2014		107.7	107.7	107.7
2015		115.8	113.1	111.7
2016		124.4	118.7	115.9
2017		133.8	124.7	120.3
2018		143.8	130.9	124.8
2019		154.6	137.4	129.5
2020		166.2	144.3	134.3
2021		175.4	151.5	139.7
2022		185.1	159.1	145.3
2023		195.4	167.1	151.1
2024		206.3	175.4	157.1
2025		217.7	184.2	163.4
2026		229.8	193.4	169.9
2027		242.5	203.1	176.7
2028		256.0	213,2	183.8
2029		270.2	223.9	191.2
2030		285.2	235.1	198.8

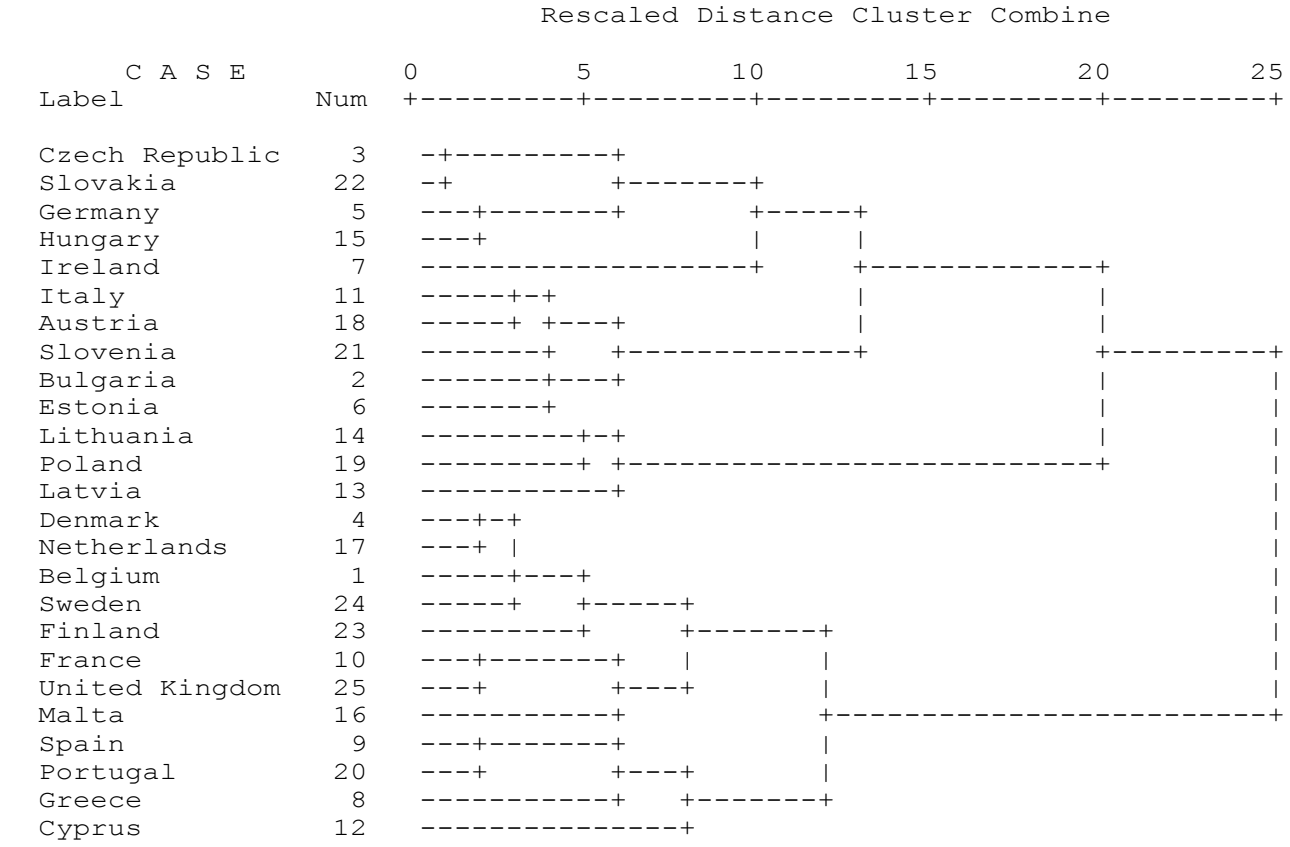
[151] Authors' calculations

[152] CSB database.

Appendix 7.

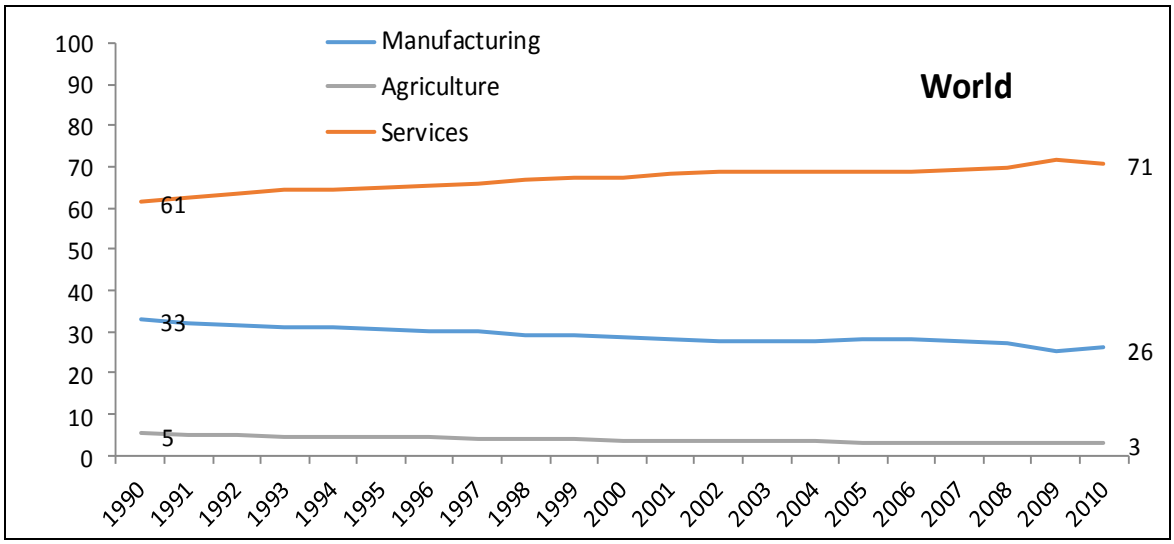
Dendrogram of Cluster Analysis

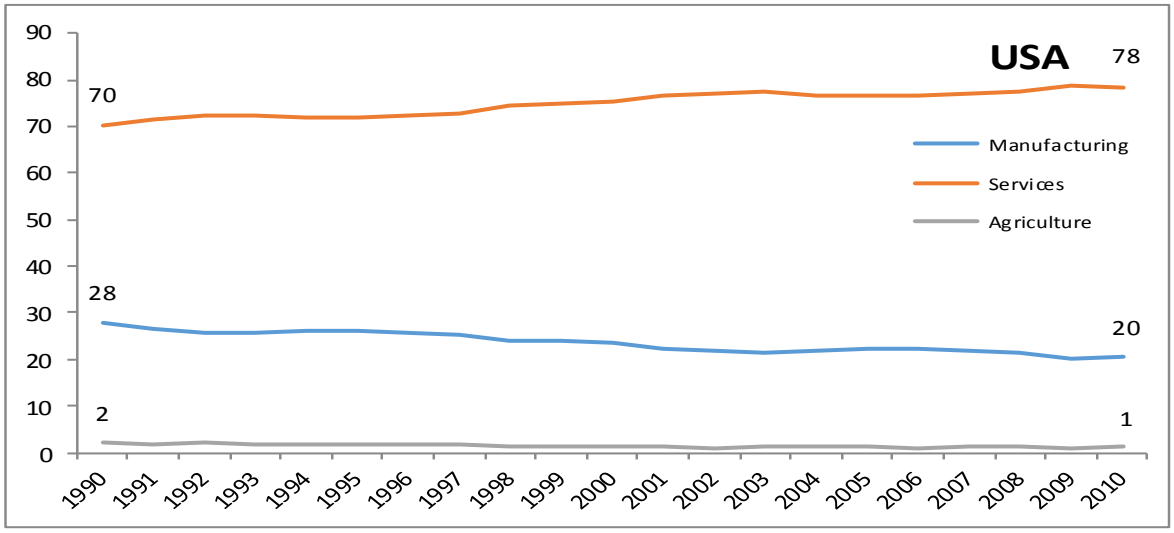
Dendrogram using Average Linkage (Within Group)

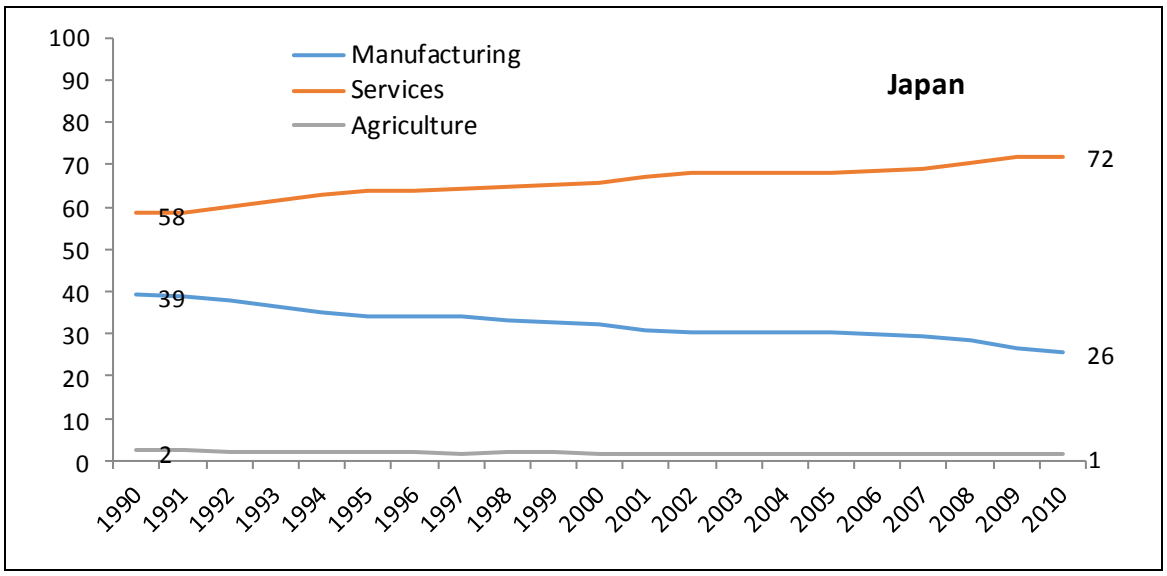


Appendix 8.

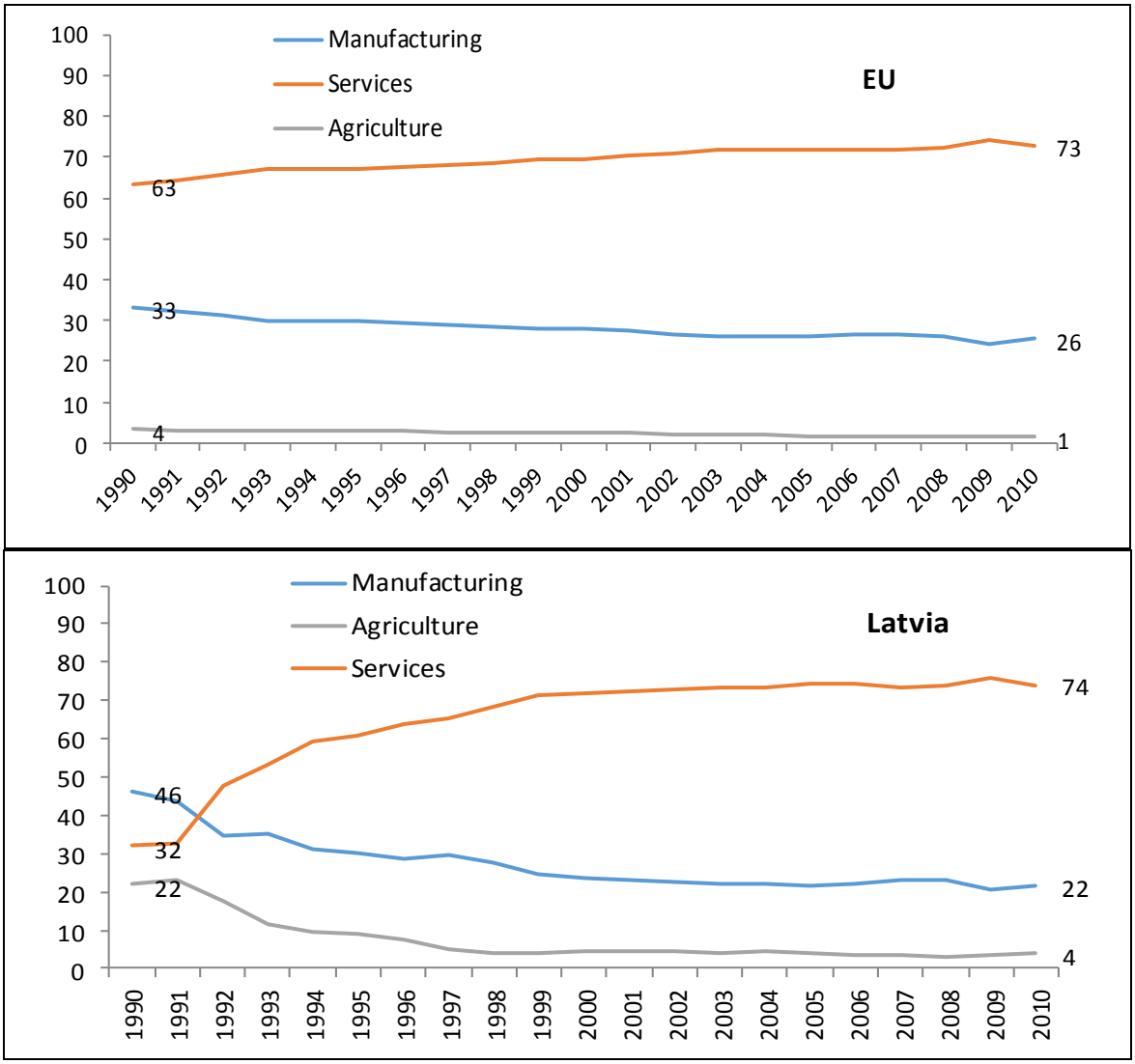
Shifts in the economic structure of the world in 1990–2010.[153]







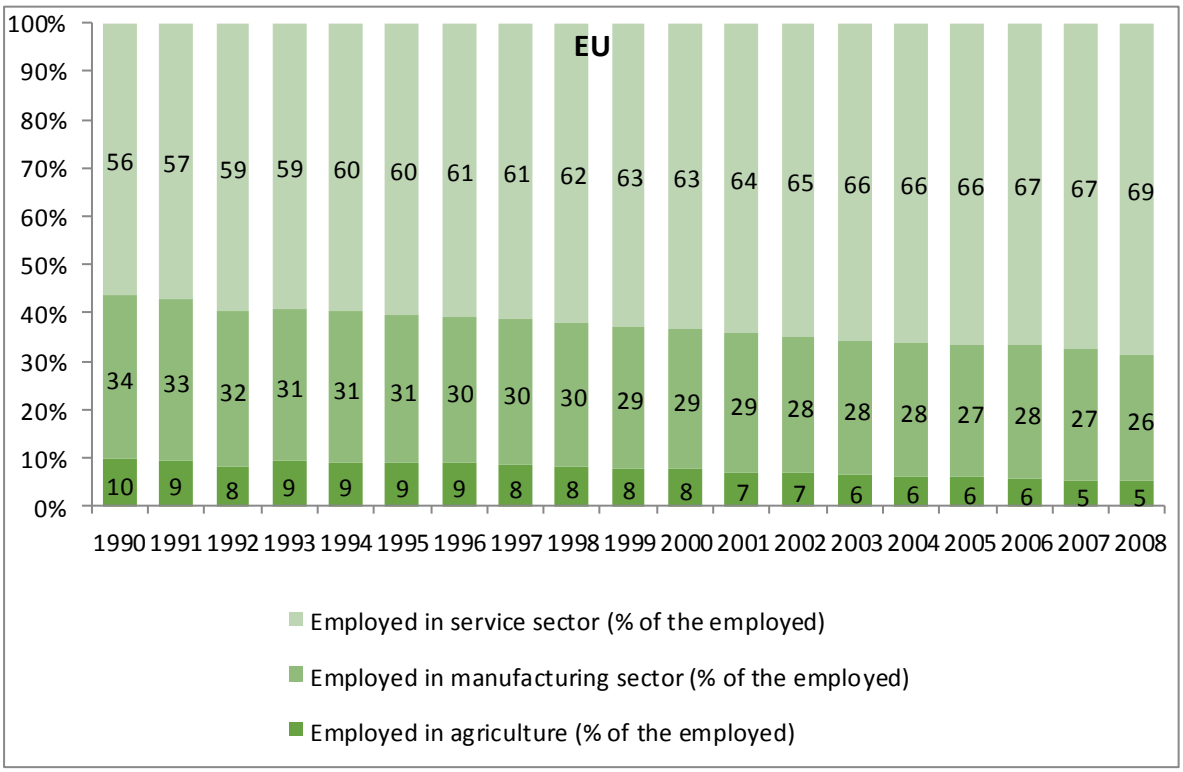
153 The World Bank database: www.worldbank.org

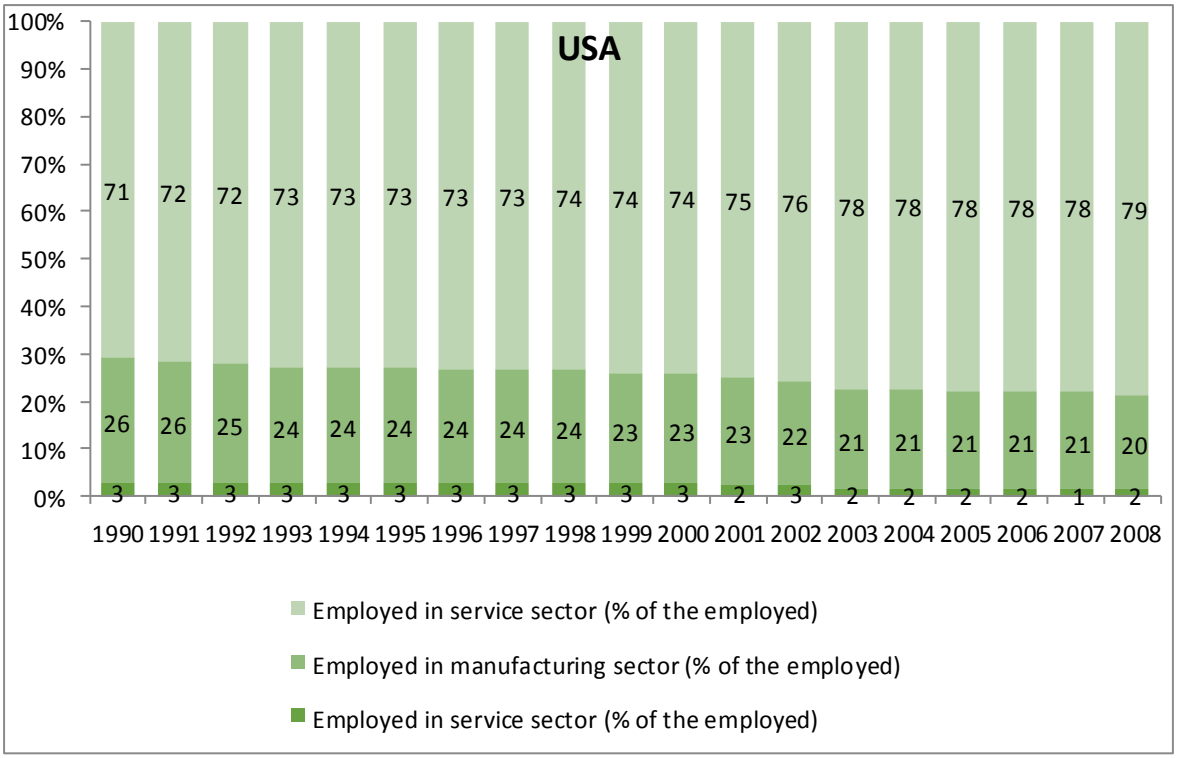

EU
Manufacturing
Services
Agriculture
100
90
80
70
60
50
40
30
20
10
0
63
33
4
73
26
1
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010

Latvia
Manufacturing
Agriculture
Services
100
90
80
70
60
50
40
30
20
10
0
46
32
22
74
22
4
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010

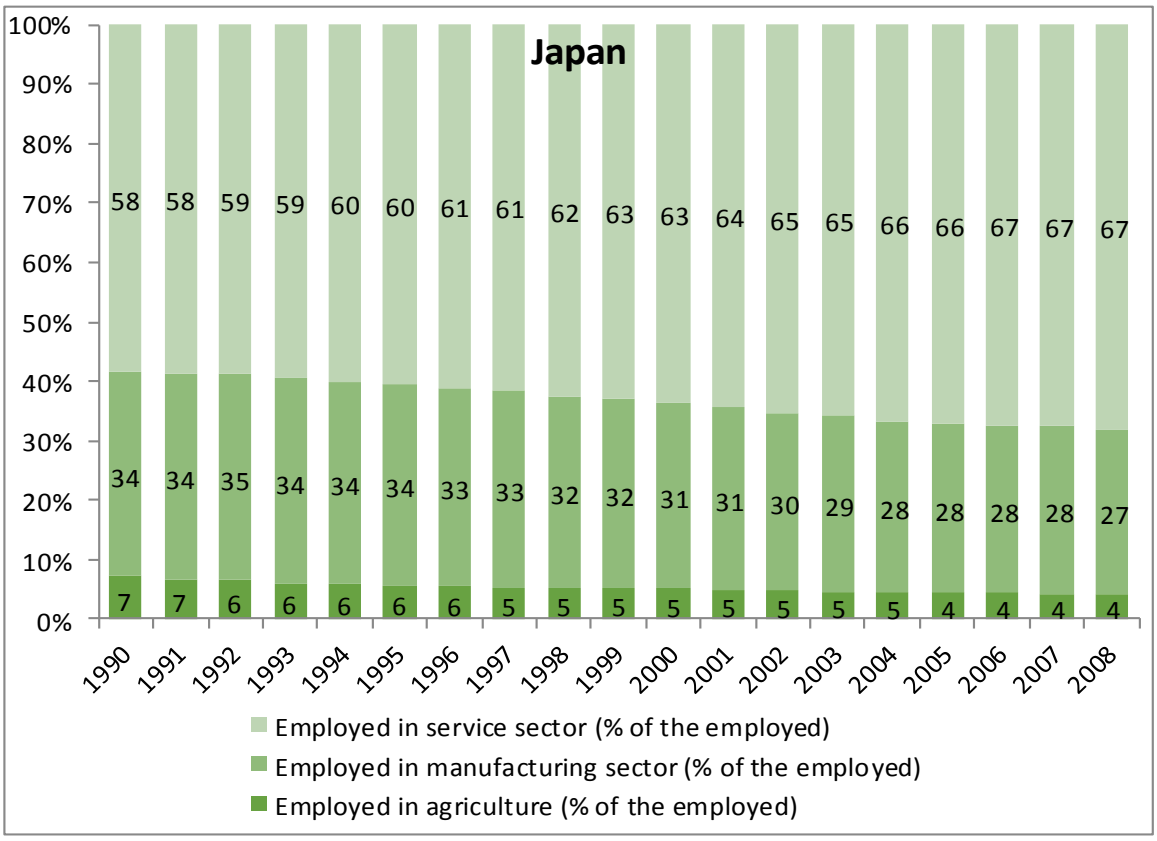
Appendix 9.

Employment trends in the EU, Japan and USA economies in 1990–2008[154]



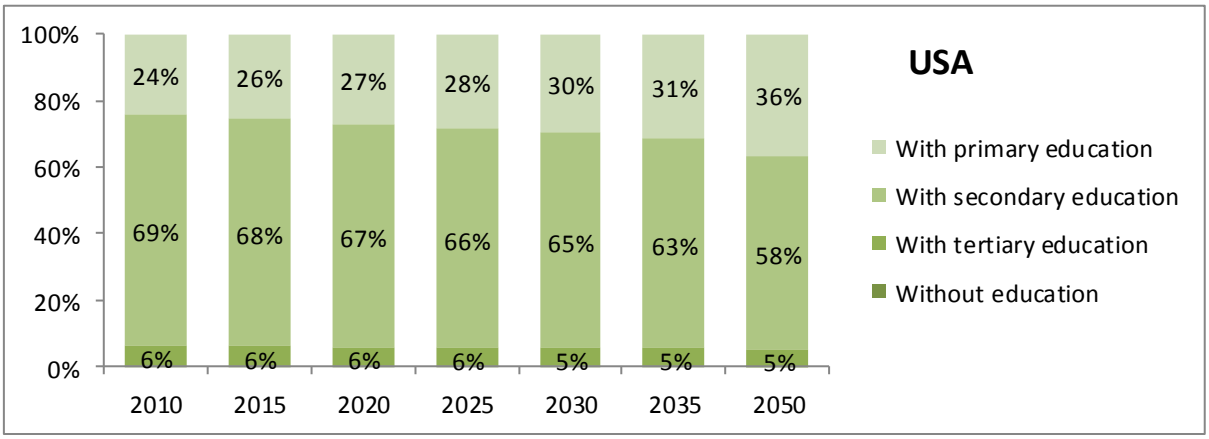


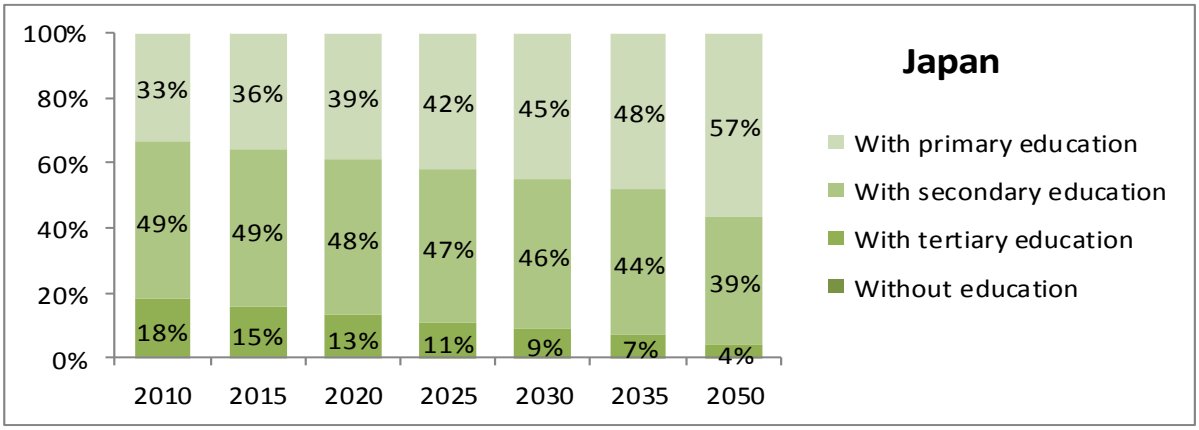
[154] The World Bank data base: www.worldbank.org

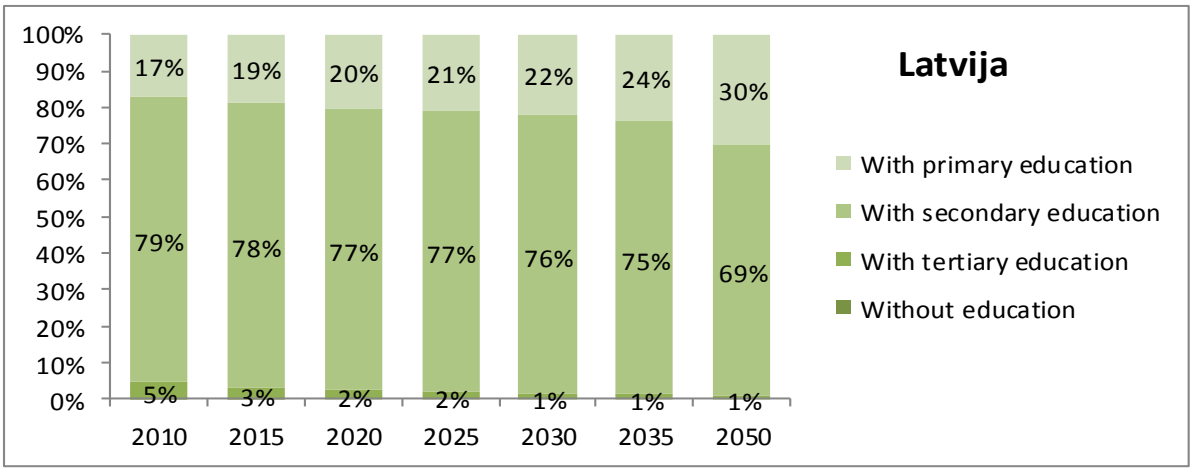

Japan
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
58 58 59 59 60 60 61 61 62 63 63 64 65 65 66 66 67 67 67
34 34 35 34 34 34 33 33 32 32 31 31 30 29 28 28 28 28 27
7 7 6 6 6 6 6 5 5 5 5 5 5 5 5 4 4 4 4
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008
Employed in service sector (% of the employed)
Employed in manufacturing sector (% of the employed)
Employed in agriculture (% of the employed)

Appendix 10.

Forecasts of the number of people with tertiary education until year 2050 in individual countries of the world (% of all population above 15 years of age)[155]



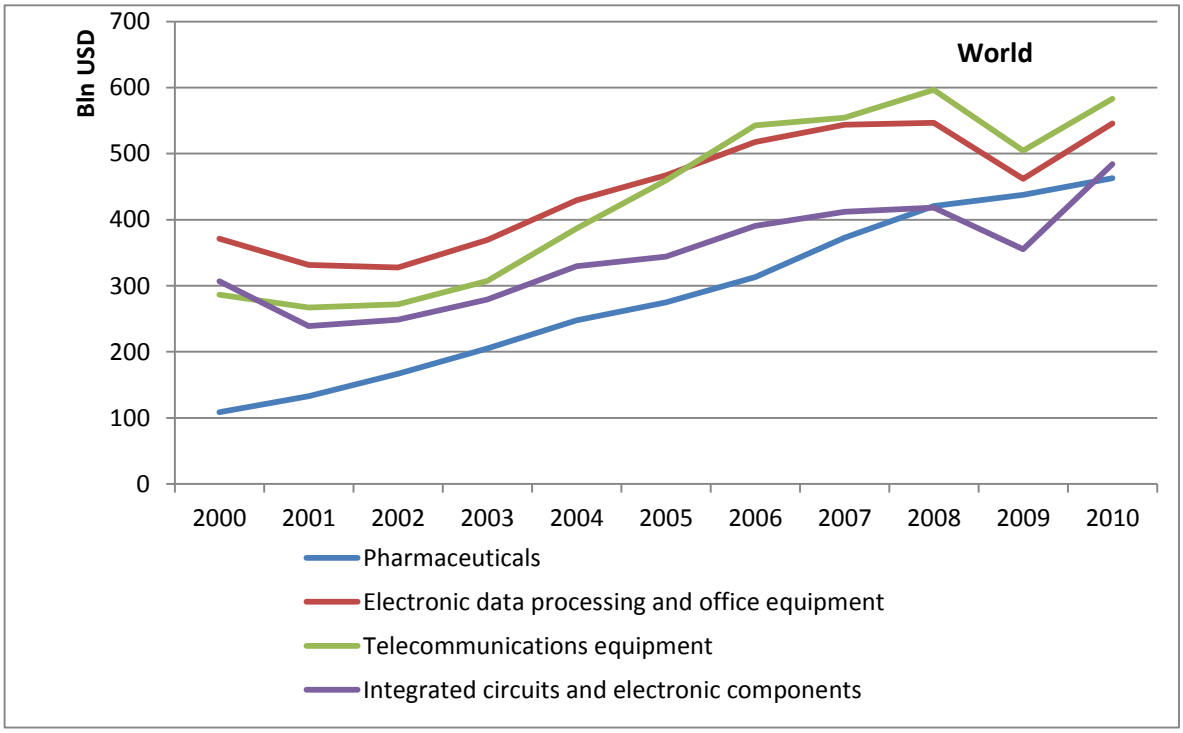


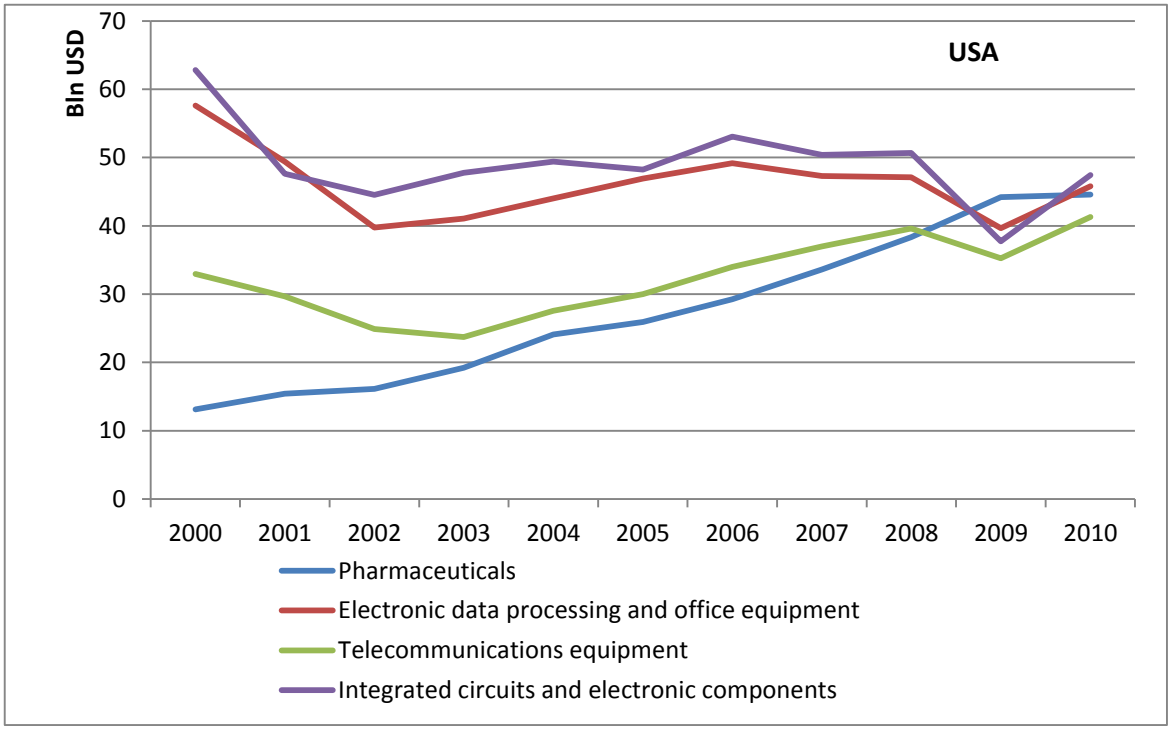


[155] The World Bank database: www.worldbank.org

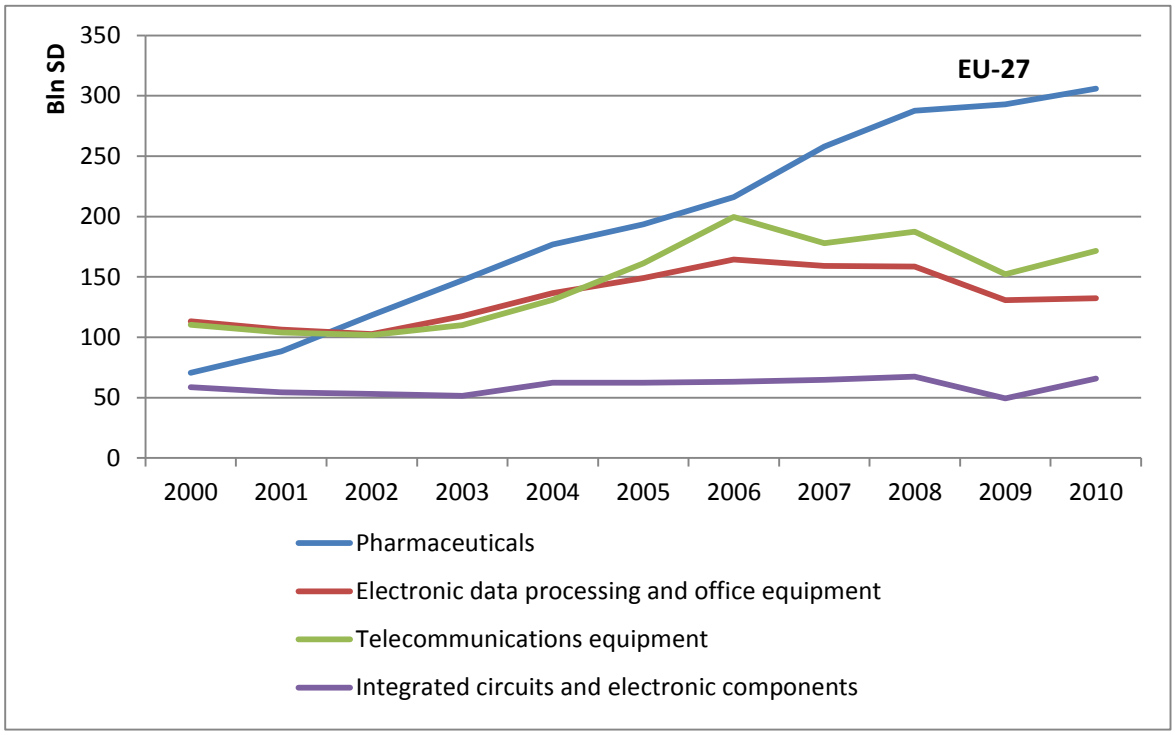
Appendix 11.

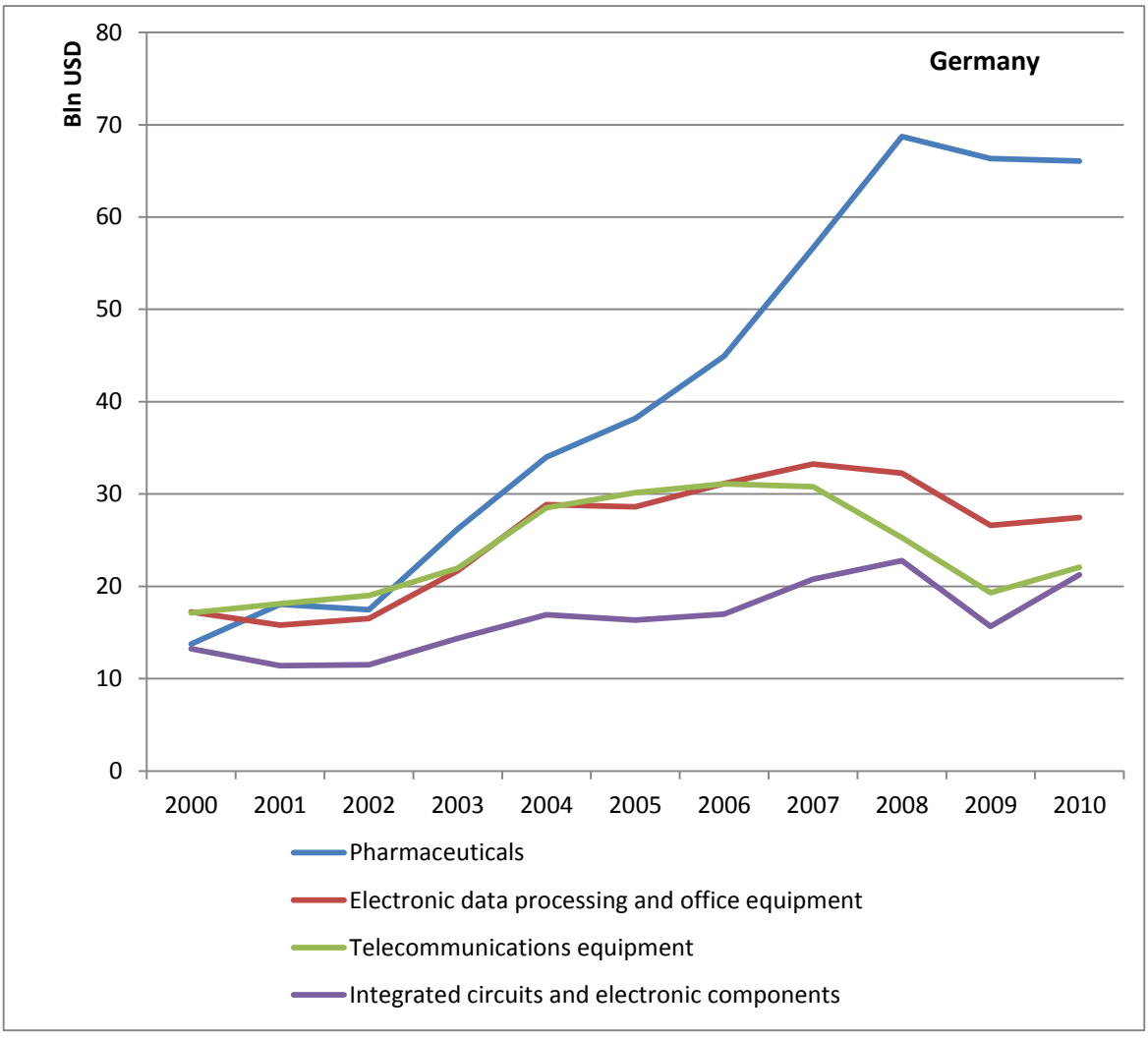
Dynamics of the export of industrial goods in the world, USA, EU27 and Germany from year 2000 to 2010 (bln USD)[156]





156 The World Bank database: www.worldbank.org


EU-27
Bln SD
350
300
250
200
150
100
50
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Pharmaceuticals
Electronic data processing and office equipment
Telecommunications equipment
Integrated circuits and electronic components


Germany
Bln USD
80
70
60
50
40
30
20
10
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Pharmaceuticals
Electronic data processing and office equipment
Telecommunications equipment
Integrated circuits and electronic components

Appendix 12.

Key trends in demand for occupations in Latvia by economic sector until year 2030

SECTORS	CURRENT DEMAND	FUTURE CHANGES IN DEMAND	DETERMINANT FACTORS OF CHANGE
Agriculture, forestry and fishing (A)	**Most demanded** occupational groups: • agricultural, fishery and related labourers (OC92) • drivers and mobile-plant operators (OC83) • operators of cranes, hoist and related plants	Demand will **decrease** for: • agriculture professionals with a higher qualification Demand will **increase** for: • agriculture workers with the medium qualification • operators of various machinery	• Average size of a farm • EU Agricultural policy • National policy • Development of technologies
Mining and quarrying **Manufacturing** **Electricity, gas, steam and air conditioning supply** **Water supply; sewerage, waste management and remediation activities (B-E)**	**Most demanded** occupational groups: • Mining, construction, manufacturing and transport workers, • Food processing and wood processing workers, • Tailors and other craftsmen and workers of the related occupations, • metal processing and machine building workers, • operators of industrial machinery	Demand will **decrease** for: • elementary occupations Demand will **increase** for: • employees with medium qualification which use the new technologies	• Development of technologies • State and EU support (the size of the support and industries which are supported)
Construction (F)	**Most demanded** occupational groups: • Builders and workers in related occupations, • workers, • operators of machines and equipment, • manufacturing managers, • legislators and officials	Demand will **decrease** for: • lower qualification workers Demand will **increase** for: • operators of equipment and machinery Demand will **remain constant** for: • administration clerks	• Technological development
Wholesale and retail trade; repair of motor vehicles and motorcycles **Transportation and storage**	**Most demanded** occupational groups: • models, salespersons and demonstrators (OC52), • drivers and mobile-	Demand will **decrease** for: • the employees who compile and systematize information in statistics, accounting, insurance, finance, register produce,	• Economic development and technological progress

SECTORS	CURRENT DEMAND	FUTURE CHANGES IN DEMAND	DETERMINANT FACTORS OF CHANGE
Accommodation and food service activities (G-I)	plant operators (OC83), • personal and protective services workers (OC51) • associate professionals of commerce and administration.	reserves, do record-keeping, co-ordinate passenger and cargo transport timetables, etc. Demand will **increase** for: • qualified employees (with both social and technical skills) and skills to deal with a complex set of issues	
Information and communication (J)	Most demanded occupational groups: • Senior specialists of ICT (OC25), • · Senior specialists of legal, social and culture affairs (OC26), • Specialists of information and technologies (OC35), • customer services clerks (OC42)	Demand will **decrease** for: • performers of routine work Demand will **remain constant** for: • employees who are able to perform abstract tasks and have the highest level skills, the jobs not requiring the presence of such skills could be outsourced as far as it is possible.	• Globalization, • Computerization of life and work environment, • Wide use of various sensors and applications, • New forms of communication
Financial and insurance activities (K)	**Most demanded** occupational groups: • corporate managers (OC12) • other professionals of commerce and administration (OC24), • associate professionals of commerce and administration (OC33) • customer services clerks (OC42)	Demand will **remain constant** for: • various professionals	• Growth in material welfare of the society, • Technological development based on the latest innovations in IT
Real estate activities (L)	**Most demanded** occupational groups: • workers in elementary occupations (OC9)	Demand will **decrease** for: • workers in elementary occupations (OC9) with basic education Demand will **increase** for: • qualified labour (occupational groups 7-8) with secondary and vocational education	• Growth in material welfare of the society, • Development of the financial market (loans)
Professional, scientific and technical activities	**Most demanded** occupational groups: • Managers and	Demand will **decrease** for: • labour force with tertiary education,	• Economic development and

SECTORS	CURRENT DEMAND	FUTURE CHANGES IN DEMAND	DETERMINANT FACTORS OF CHANGE
Administrative and support service activities (M-N)	professionals • Employees in the field of protective services (OC54) • employees in elementary occupations	• low-qualified labour force (in occupational group OC54) Demand will **increase** for: • the labour force with the secondary, professional and vocational education (qualified workers)	technological progress
Public administration and defence; compulsory social security **Education** **Human health and social work activities (O-Q)**	**Most demanded** occupational groups: • teaching professionals (OC23) • life science and health professionals (OC22) and associate professionals (OC32) • professionals of commerce and administration (OC33) • Domestic helpers and cleaners (OC91)	Demand will **decrease** for: • teaching professionals (OC23) • life science and health professionals (OC22) Demand will **increase** for: • professionals of commerce and administration (OC33) • life science and health associate professionals (OC32) • Domestic helpers and cleaners (OC91)	• Demographic factors and society ageing, • level of income and welfare, • technological progress, • digitalization, • scientific progress, • development of new and effective medicines and medications
Arts, entertainment and recreation **Other service activities** **Activities of households as employers; undifferentiated goods and services-producing activities of households for their own use,** **Activities of extraterritorial organisations and bodies (R-U)**	**Most demanded** occupational groups: • personal and protective services workers (OC51) • legal, social and culture professionals (OC26 un OC34) • life science and health professionals (OC22 and OC32).	Demand will **decrease** for • employees with general secondary and tertiary level education, Demand will **increase** for: • qualified employees with professional education in a specific, art, entertainment and culture related, field The demand will **remain constant** for: • different elementary occupations (cleaning persons, general workers)	• Growth of welfare