Abstract

Human capital is one of the main factors of economic growth in the modern knowledge-based economy era. Education, knowledge, skills, competencies, attitude, health and welfare have an impact on it. Investing in human capital, in the same way as investing in the physical capital, is an important factor to increase labour productivity of individuals, having major impact on quantitative and especially qualitative development of labour force. Availability of qualified labour force ensures both increase of labour productivity, and attraction of investments to entrepreneurship.

The objective of the article – to analyse investments in human capital and to analyse labour productivity, which would ensure sustainable development of Latvia.

The following tasks are defined to achieve the objective:

- To study theoretical aspects of investments in human capital;
- To evaluate investments in the educational system and health care system of Latvia;
- To study labour efficiency and investments in the labour market development in Latvia.

The methods used: monographic, statistical analyses and synthesis.

The key words: human capital, investments / inputs, labour productivity.

1. Investments in human capital – theoretical aspects

Investments in human capital are inputs in education, health care, professional qualification and other activities which allow people to be more economically efficient. Theodore W. Schultz has defined human capital theory as knowledge and skills obtained by people as capital in the process of vocational and technical education. Such a capital is a product of well-considered investments and it generates income (Fitzsimmons, 1999). Human capital theory reveals that individuals and the whole society gain economic benefits from investments in people (Sweetland, 1996). Based upon the work of Schultz (1971), Sakamota and Powers (1995), Psacharopoulos and Woodhall (1997), human capital theory rests on the assumption that formal education is highly instrumental and even necessary to improve the production capacity of a population. In short, the human capital theorists argue that an educated population is a productive population (Olaniyan, Okemakinde, 2008).
Human capital theory emphasizes how education increases the productivity and efficiency of workers by increasing the level of cognitive stock of economically productive human capability which is a product of innate abilities and investment in human beings (Olaniyan, Okemakinde, 2008). According to Babalola (2003), the rationality behind investment in human capital is based on three arguments:

1) the new generation must be given the appropriate parts of the knowledge which has already been accumulated by previous generations;
2) new generation should be taught how existing knowledge should be used to develop new products, to introduce new processes and production methods and social services;
3) people must be encouraged to develop entirely new ideas, products, processes and methods through creative approaches.

Analysis of education and development as investments in human capital are dealt with in the works of such outstanding economists as G.Becker, E.Denison, S.Fabricant, J.Mincer, T.Schultz (Nafukho, Hairston, Brooks, 2004). According to G.Becker’s concept, “human capital analysis starts with the assumption that individuals decide on their education, training, medical care, and other additions to knowledge and health by weighing the benefits and costs. Benefits include cultural and other non-monetary gains along with improvement in earnings and occupations, while costs usually depend mainly on the foregone value of the time spent on these investments” (Becker, 1992). Education, training, medical care, personal development activities are also included in human capital as they improve health, increase income or give satisfaction for life-long learning (Becker, 1992). The scientist defines human capital theory as a form of investment made by an individual in their education by the moment when the return expressed in additional income is equal to education costs. Income as additional gain is important for both an individual, and the whole society, and this is a form of advanced production that can be offered by educated people. (Nafukho, Hairston, Brooks, 2004).

G.Becker recognized that education and training is the most important components of investing in human capital and that income of a better educated and trained person is usually higher than overage wage rate (Becker, 1993). There are three types of training or education which are closely related to the return rate and human capital (Dubra, 2010):

- Education at school – to gain knowledge in the institution that concentrates its activity on training process and offers education as a product.
- Training at work place – to gain new skills and to improve the gained skills at work place:
General training – skills that can be used at any enterprise;
Specific training – it makes no impact on the employee’s productivity if the employee works for another enterprise.

- Other knowledge – any other information obtained by an individual to improve own economic situation.

G. Becker emphasises that one of the most effective theoretical concepts in human capital analysis is a difference between general and specific training and knowledge. This difference helps understand why employees with good specific skills rarely tend to quit work and are the last to be fired in the situation of economic recession. This difference also reveals why usually existing internal cadre are promoted instead of attracting new employees from outside (Becker, 1992).

Kenneth Zula and Thomas picture 1), where investments or inputs interact with production capacity and output.

*Picture 1. Human capital model and related investments or inputs, and return on investment or production capacity and output* (Zula, Chermanck, 2007). Chermanck reflected human capital theory in the model (see

It also should be taken into account that education has an impact on welfare of the individuals after education as well as indirectly on the whole society. Indirect impact of education is expressed in sharing and dissemination of knowledge which is characteristic to the working environment of well-educated people thus increasing productivity of each single individual who have gained knowledge from their well-educated colleagues. Besides, the society and individuals benefit from an increasing number of well-educated people due to the decreasing crime level, increasing health conditions, improving democracy process, increasing rule of law and political stability (McMahon, 1999). The most significant investments in Eastern and central European countries are made within the formal general
education system, but the amount of investments in human resource development in job places is relatively small (Ederer, Shuler, Willms, 2007).

2. Education as human capital developing component

Accumulation of physical capital in Latvia like in other countries with underdeveloped economies plays an extremely role in long-term growth of national economy, increase of population income level and cohesion of EU more developed countries. Investments insure not only more rapid capital growth but also productivity growth – in the result of innovation, technology upgrade and dissemination of global knowledge. The studies prove that accumulation of capital is one of the main factors to determine growth disparities among the countries – the countries with more investments in equipment reach higher growth rate. In order to ensure sustainable development, besides investments in physical capital it is important to invest also in human capital – mainly in education. Investments in both physical and human capital are especially topical in Latvia, taking into account demographic development prognosis and labour migration (Purviņš, Rusakova, 2007).

Economic progress cannot take place without major investments. Human capital model considers the willingness of an individual to obtain education as an investment that brings benefits. Obtaining of education is connected with both direct costs (tuition fee, purchase of study supplies etc.), and alternative costs (foregone income during tuition). The role of education would degrade if present investments in education do not create possibility to compensate them in the future. The education factor in increasing productivity has never been disputable, especially in modern situation of technical and scientific progress (Gods, 2008). Of course, labour productivity is related to specific work skills and attitude of an individual; however education level is one of the main productivity indicators. The employer also perceives the education level of the employee as a productivity signal – the higher is the education level, the higher is the productivity. Besides education level, there are other productivity signals, such as educational institution, educational programmes and even the country where the education has been obtained.

Each country has expenditures for education. In 2008, in EU-27 member states overage national allocations for education was 5.07% of GDP (see picture 2), Denmark had major allocations for education (7.75% of GDP), Slovakia – minor allocations (3.59% of GDP). Latvia’s allocations for education were 5.71% of GDP which even exceeds EU-27 overage rate and is the highest rate among the Baltic countries.
When analysing the rate of PhD students – main driving engines of research and development - in science and technologies in 2009, it can be concluded that they constituted overage 0,40% in the age group 20 – 29 years in EU-27 (see picture 3). In Latvia this figure was 0,19 %, which is less than a half of overage EU-27 and as such can be considered as quite low indicator in EU and the lowest in the Baltic countries.

In order to implement knowledge-based national economy, allocations for research and development % of GDP are of high importance. In Latvia, the investment rate in research and development (R&D) in 2010 was 0,60% of GDP (see picture 4), and this can be evaluated as low public and private sector investment rate in R&D (to compare with EU-27
overage 2,00% of GDP). In 2010 in comparison with 2005, the investment rate increased, but the increase has been quite slow.

![Graph showing R&D allocations in 2005, 2010, % of GDP](image)


A new objective to increase investments in R&D has been set up in the National reform programme of Latvia – in 2015 – 1,5% of GDP. To achieve this objective the following policy directions have been defined (National reform programme of Latvia „EU 2020” strategy implementation, 2011):

- Development of scientific activity potential;
- Creation of long-term cooperation platform for enterprises and scientists;
- Support to development of innovative businesses.

Nevertheless, there are several challenges to increase investments in R&D in Latvia (National reform programme of Latvia „EU 2020” strategy implementation, 2011):

- Rather small number of employees in science and research (aging of scientists, insufficient number of PhD students, see picture 3);
- Underdeveloped infrastructure if science and research, insufficient number of modern equipped laboratory facilities for implementation of technological projects;
- Weak potential for commercialization of research results, underdeveloped cooperation between science and industry sectors;
- Mainly small and medium size enterprises without capacity to invest in R&D form business structure in Latvia, and rather weak high-technology sector.

The following measures should be implemented to foster increase of investments in R&D: attraction of additional human resources to science and research, creation of modern scientific and research centres, fostering of cooperation between business and scientists as well as support to development of innovative products and bringing out into production.
In Latvia, population rate with higher education in the age group 30-34 in 2008 was 27%, in 2009 - 30% (to compare: in 2000 – 18,6%). One should take into consideration that both the purchasing capacity, and birth rate of the population were the lowest in 2009, in the coming 4-5 years (from 2010 to 2015) the total number of students will continue to decrease. The increase of students would increase again after 2020 reaching 85-90 thousand of students in the better demographic and paying power situation. The following challenges take place in Latvia to increase population rate in higher education (National reform programme of Latvia „EU 2020” strategy implementation, 2011):

- Reduce of paying power in the result of the crisis thus decreasing a number of students in charged studies;
- Underdeveloped infrastructure of higher educational institutions;
- Insufficient number of university lecturers and scientific staff;
- Study programmes are fragmented, they face the risk of quality and critical mass provision in the future due to the fact of decrease of students and resources available (decrease of state budget funding, decrease of academic staff wages, decrease of own income);
- The study programmes offered in the regions are poorly related to regional specifics and real needs of labour markets in these areas.

The main measure to increase the rate of population in higher education are as follows: adaption of qualification and skills acquired in studies to the changing demands of labour market, upgrading of higher education infrastructure, improvement of funding mechanism of studies as well as improvement of study and scientific activities.

Although educational system in Latvia is able to offer sufficient and varied opportunities to obtain education, some part of young people, having their secondary education, in the educational process face various problems and quit studies before they obtain secondary education. In 2008, population rate in the age group 18-24, who did not obtain secondary education and did not continue studies, was 15,5%, which was the highest rate than overage in EU (14,9%). But in 2009 in Latvia the situation improved and the rate reached 13,9%, while in 2010 - 13,3%. According to the date of Ministry of Education and Science, Republic of Latvia, in the beginning of school year 2010/2011, 63,3% of students who obtained basic education joined secondary schools, and 35,4% joined vocational schools (1,3% did not continue their education at all). Statistical data of the school year 2009/2010 show, that 9,8% of those students, who joined general secondary education, did not complete their education, in vocational schools - 12,6%. The main reasons, why students interrupt their education, are as follows: socio-economic situation in families, lack of motivation, learning difficulties, influence of peers, school resources. Insufficient cooperation between parents, educational institutions and municipal staff.
affect attendance of studies. Decision making to improve educational system and to ensure dynamic development of it is hindered by slow information exchange between the school and the ministry on the results of the current school year. There are following challenges in Latvia to decrease the rate of students, who left schools without completed their studies (National reform programme of Latvia „EU 2020” strategy implementation, 2011):

- Lack of support (including pedagogical) to young people who start a new educational level;
- Lack of a single system in practice, defining how educational institutions inform parents, municipalities or state institutions, if the student does not attend the school without a plausible reason;
- Worn-out and archaic infrastructure of educational institutions (teaching aids and materials).

To decrease the rate of the students who did not complete their studies, the following measures should be undertaken: improvement of student record-keeping at schools, development of a single information system (the system how an educational institution informs parents, municipalities or state institutions if the student does not attend the school without a plausible reason), introduction of modern teaching methods, including development of e-studies.

3. Health as human capital creating component

Society health has an important impact on sate GDP level and even more significant – on economy growth. In order to increase competitiveness of the country, one of social security directions in Latvia’s strategic middle-term development 2013 is to ensure availability of health care services regardless of individual income level and living place as well as to promote healthy way of living, thus decreasing state expenditure for health care provision in the long-term perspective (Informative Report of Ministry for Regional Development and Municipal Affairs, Republic of Latvia, 2010). The main evaluation indicator of population health and social security is expected new-born lifespan – it reflects overall life quality in the country, overall population health situation and health care quality (Evaluation on achievement of society health strategy objectives, 2010). When analysing expected new-born lifespan in comparison by countries (see picture 5), Latvia’s indicators are among the poorest in EU. In 2009, expected new-born lifespan in Latvia was 73,3 years and it was the second lowest behind Lithuania, besides, it was by 8,6 years shorter than in Italy, where the expected new-born lifespan was 81,9 years or the highest among EU – 27 member states.

Infant death-rate is an important indicator for Latvia’s demographic situation, and infant mortality 7.8 babies per 1000 new-borns is more than two times higher than this indicator in Estonia (see picture 6); this rate is higher only in Bulgaria (9.0) and in Romania (10.1).


The rate of people, who in *Eurostat* inquiries indicated, that they did not make health checks due to the limited availability of medical services (too expensive; too far to go; too long to wait) in Latvia in 2007, was 12.8% or four times more than in EU-27. Mortality per 100 000 people (except external reasons of death and unclassified symptoms) in Latvia in 2007 was 1 156.7 people, in EU - 27 883.6 (Informative Report of Ministry for Regional Development and Municipal Affairs, Republic of Latvia, 2010). When analysing situation of accidents at work (industrial accidents), they are mainly registered for man, but professional
diseases are mainly registered for women. In Latvia in 2009, a number of deaths due to industrial accidents per 100 000 employed in overage was 9.1 men and 1.2 women (Egle, 2010), and the tendency shows that the indicator for man is decreasing, while for women – increasing. The rate of employed with health problems, arising from working environment, is equal for both genders.

The disparities can be observed in Latvia’s population health habits in terms of gender, living place, age, education and income level per one members of a family. Self-assessment of health is one of the indicators to analyse satisfaction level and interest of population in keeping up their health. According to the data of the surveys on habits effecting health of Latvia’s population, people with higher income and education level treat their health better. The disparities can be observed also in self-assessment of health between genders – men treat their health better (Survey of the habits influencing Latvia’s population health, 2008). Analysing situation in Latvia in general, it can be concluded that there is a lack of indicators that would characterize disparities among various socio-economic groups, and the situation of the most disadvantageous groups has not been clearly defined (Evaluation on achievement of society health strategy objectives, 2010).

According to the data of Central Statistical Bureau, there is a constant tendency of population aging in Latvia: if in the beginning of 1990-ties the number of children and young adults exceeded the number of pension age people, then since 1993 this proportion has changed. Increasing population age, self-assessment of poor health and very poor health can be observed in the group after exceeding working ability age. In 2008, the results of Latvia’s population health survey showed that in the age group 65 - 74 the health situation as poor or very poor was defined by 26% of population, but in the age group above 75 years – 43 % (Evaluation on achievement of society health strategy objectives, 2010). According to EU prognosis it is expected that by 2050 a number of people in the age of 65 years and above will increase in EU by 70 %. As a result a number of important tasks should be resolved – the demand for health care services will increase and the health care systems should be adapted to the needs of aging society, at the same time sustaining this system in the new economic situation with decreasing number of economically active population. The most important task is to promote healthy and active aging of European population – by keeping up good health the life quality is higher, people are independent and they have possibilities still to be active. Health protection system will not have additional burden and there will be less people who pension off due to health problems, if in aging society population have good health. This factor can promote growth of European economy, including Latvia’s economy (Evaluation on achievement of society health strategy objectives, 2010).
Aging of the society will significantly influence health care service sector in Latvia. Necessarily there will be a need for re-structuring of health care institutions, for instance, re-structuring of paediatric units into geriatrics units, and specialization in treating of the diseases typical to older people. That is why there is a clear need to invest timely in health care and related knowledge and technologies (life science, bio-medicine, pharmacy) and in promotion of healthy living style of any generation. Adequate preparations timely should take place to meet the expected increasing demand for everyday care services for elderly people by developing care economy or “silver economy (Latvia’s sustainable development strategy by 2030).

4. Labour productivity and investments in human capital for labour market development

An important pre-condition for effective use of human resources is provision of population with appropriate education and skills as well as development of new labour force. The major task in the process is to achieve the adequacy of the educational system to the changing labour market requirements, so that the educational system would be able to produce labour force corresponding to the needs of the future economy development tendencies and orientation towards knowledge based economy.

Knowledge and skills determine not only one’s possibilities to integrate into the labour market, but also to make a successful carrier in the situation of changing technologies and economies (European Commission, 2002).

![Labour productivity by added value, by economic activity (NACE 1.1.red.) in 1998-2009, in Latvia. Source: Calculation by the authors according to the information by Central Statistical Bureau](image)

Sector grouping by the authors, where A,B – agriculture, hunting, forestry, fishery; C,D,E – mining and processing industry and related sector services; F- building; G,H,I – trade, hotel, restaurant, transport, communication and repair services; J, K- financial services, operations with real estate; L,M,N,O,P - state administration, public, social and individual services.

Picture 7. Labour productivity by added value, by economic activity (NACE 1.1.red.) in 1998-2009, in Latvia. Source: Calculation by the authors according to the information by Central Statistical Bureau

After analysis of the labour productivity calculations in Latvia according to the economic activities (see picture 7), the authors concluded that the sectors with labour
productivity in the period from 1998 to 2008 significantly differ from other sectors are financial services, operations with real estate (J, K), and this can be explained by rapid increase in crediting and growing demand for real estate in the respective period. Labour productivity has reached its maximum in these sectors in 2008 and it reached 31 139 LVL or 44 484 EUR per one employee in the sectors. The lowest indicators of labour productivity were in the sectors of agriculture, hunting, forestry and fishery (A,B) - 4 997 LVL or 7 139 EUR, that made only 16% of labour productivity in the sectors of financial services, operations with real estate.

In Latvia in 2008, the productivity per one employee was 51,3% of overage EU rate, in Estonia - 64,7%, in Lithuania - 61,3%. Even lower productivity rates were in Bulgaria - 36,5% and Romania – 47,7%. On the other hand, the highest rates were in Luxembourg, exceeding overage rate by 72,8%, in Ireland – by 31,5% and in Belgium – by 24,3% (Eurostat). During ten years the productivity per one employee in Latvia was increased by 40%, in Estonia - by 56%, in Lithuania - by 50%, and these are the most rapid productivity rates in Europe. At the same time, in Poland during the same period the productivity was increased by 25%, in Czech Republic - by 19%, in Hungary - by 7% (Ukenābele, Pelane, 2010).

There are several reasons why labour productivity and also human capital productivity in Latvia is relatively low:

- Due to short-term orientation, companies and individuals insufficiently invest in developing human capital competencies and skills, but significant investments pay back only in long-term perspective;
- Companies and municipalities are afraid of “brain-drain” of capable and trained employees and keep off investing in their development;
- Human capital use intensity and other barriers (time, money) do not promote significant investments by both employers, and employees;
- National mainstream support programmes pretty often are too complicated and they change frequently, but people concerned do not have adequate information and consultative support to make justified decisions (Latvia’s sustainable development strategy by 2030).

In the result of economic crisis the amount of GDP has significantly diminished in Latvia – in 2009 major changes took place in such national economy sectors as building (decrease of amount by more than 30% in comparison with 2008), trade and processing industry (decrease by more than 25% in each of the sectors), transport and communication.
sectors (decrease by more than 15%). Overage EU GDP in 2008 increased by 0.8% in comparison with 2007 (Regional development in Latvia, 2009).

In 2010, gradual increase of GDP continued and trade sectors started having more impact in Latvia’s national economy, which is justified by improvement of the situation in the global economy and increase of external demand. Export amount in 2010, in comparison with 2009, increased by 29.7%. Processing industry in 2010, in comparison with 2009, increased by 15.4%, electrical energy, gas and water supply sectors – by 12.7%, and primary sectors – by 3.8%. In total the growth of these sectors gave 1.6% in GDP increase. Wood processing, metal working, electrical and optical appliances production made the major input in the growth of processing industry. At the same time, the rate of high technologies produce in the total export amount in 2010 was relatively low – 10.9% (in 2009 – 10.7%), on the other hand – the rate of medium-high technologies produce in the total export amount in 2010 was 14.5%, in 2009 – 12.5% (Report on development of national economy in Latvia, 2011).

Analysis of the situation in the field of innovation development, the study „Innovation Union Scoreboard 2010”, issued in 2011, show that Latvia takes the last place – 27th - among 27 countries of the study (Estonia – 14th, Lithuania – 25th). Although Latvia’s innovation index is the lowest among EU-27 member states, it should be emphasised, that in Latvia during last five years the overage increase of the indicators of this index is 2.71% and it exceeds the overage EU-27 increase – 0.85%. In order to achieve the level of the most developed countries, the increase should be even more rapid. In the mentioned above study several indicators are being evaluated in the eight fields important for innovation development – human resources, receptiveness of research environment, excellence and attraction, funding and support, enterprise investments, enterprise cooperation and entrepreneurship, intellectual property, innovation activity, economic effects. Based on the study, it can be concluded that Latvia has relatively better indicators in the field of human resource development and major improvements can be observed in the field of intellectual property protection. The indicators for research environment, innovative enterprises, cooperation between businesses and scientists are rather low (The Innovation Union's performance scoreboard for Research and Innovation, 2011).

During the period from 2006 to 2008 in overage 24.3% of companies were innovative in Latvia while at the same time in EU member states this indicator is overage 52%. Turnover in innovation active companies in 2008 reached 52.7% of total enterprise turnover in Latvia (Eurostat).
In 2010, according to the data of Enterprise Register, Republic of Latvia, 13 345 new businesses were registered, which is by 4 255 businesses more than in 2009. This rapid growth of new businesses is related to the amendments in the Commercial Law, as since the 5th of May, 2010, in Latvia, limited liability company can be registered with a reduced fixed capital – starting with 1 LVL. Having as its main goal to promote investments in human resources and to promote participation of businesses in upgrading qualification of labour force in order to foster labour productivity, in 2010 Latvian Investment and Development Agency continued provision of support to the projects in the amount of 19.4 million LVL within the framework of European Social Fund co-financed activities „Support to training of employees for promotion of business competiveness – support to trainings organized by partnerships” and „Support to training of employees for promotion of business competiveness – support to training individually organized by businesses (Informative report on results of 2010 of implementation of Business competiveness and innovation promotion programme 2007-2013). In 2010, State Employment Agency within the framework of the project „Measures of lifelong learning for employees” started implementation of the measure „Training programmes to involve adults in life-long learning”. The objective of the measure is to promote competitiveness of the employed and self-employed persons above 25 years of age by extending availability of life-long learning to adults, thus providing opportunities for the employed people to go in for professional upgrade or informal education programmes, co-financing 10% of the training costs.

Conclusions and proposals
1. Investments in human capital mean investments in education, health care, qualification and other activities, which make people economically more productive. There are three types of training or knowledge and they are closely related to the return index and human capital: training at school, training on job (general education, specific education), and other knowledge.

2. Human capital model considers the willingness of an individual to obtain education as investment (input) that brings benefit (gain). The employer regards the educational level of the employee as a productivity signal – higher education means higher productivity. Investments ensure not only more rapid capital growth, but also productivity growth – in the result of upgrading innovations, technologies and knowledge.

3. Labour productivity depends not only on working abilities of the employee, but also on strategic leadership and human resource management, applied technologies and process optimization, and this is a significant pre-condition for sustainable development of the country.
4. There are several reasons, why labour productivity and also human capital productivity in Latvia is at relatively low level: due to short-term orientation companies and individuals insufficiently invest in development of human capital competencies and skills, companies and municipalities are afraid of “brain-drain” of capable and trained employees, intensity of human capital use and other barriers (time, money) do not promote significant investments in education neither by employees, nor by employers, national mainstream support programmes pretty often are too complicated and often change.

5. In Latvia, major investments, like in other Eastern and Central European countries, are made within the framework of formal general educational system, but the amount of investments in human resource development in job places are relatively small. It is important to increase the rate of population in higher education and to decrease the rate of students who quit secondary and vocational schools without completing their education.

6. In Latvia, the rate of investments in R&D (Research & Development) in 2010 was the lowest in EU. The main measures to increase it are as follows: attraction of additional human resources to science and research, creation of modern scientific and research centres, fostering cooperation between businesses and scientists, and support to elaboration and production of innovative products.

7. In order to maintain and improve health of the population, it is required timely to ensure availability of health care services regardless of income level and living place, and to promote healthy way of living, thus decreasing state expenditure for health care provision in long-term perspective.

8. The main task in order to ensure population with adequate education and skills and to develop new labour force – is to achieve conformity of the educational system to the changing requirements of the labour market and ability to produce labour force according future economy development tendencies and orientation towards knowledge-based economy.

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