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HUMAN CAPITAL AS A MAIN ELEMENT OF INTANGIBLE ASSETS[1]

Conceptual aspects of human capital are examined in the light of intangible assets. Their growing importance in the contemporary conditions of development are outlined. A comparative characteristic and assessment of human capital, its formation and utilization in Bulgaria is made with the help of internationally adopted indicators and their comparison with those in economically developed and candidate countries.

JEL: I20; O15; O30

Some fundamental economic transformations took place during the last few centuries. The industrial revolution changed the basis for the development of society from agriculture to industry. The scientific revolution from the last century led to new significant transformations and to the appearance of new theories expounding the driving forces of the economic development. Today, in the conditions of fast globalisation and wide-spreading new technologies, information and communications, great importance is being attached to human capital as the main engine of development.

Theoretical basis

Together with the substantial changes that have occurred in the structures of the economies of the separate countries and the development of technics and technologies, in the middle of the XX century the economists began to lay weight on education as a factor of development. A series of important economic problems – the dependence of contemporary production and technology on education, skills and qualification, the fast growth of the expenditures on education and health care, the rise of unemployment, the attempts to explain the distribution of incomes, etc. - stimulate the interest of the economists to examine and analyse the essence of technological change and human potential. As a result, abundant empirical material is accumulated, testifying to their economic importance.

On this basis, taking into account the real changes in the economy and the fact that science and education have attained a paramount importance for the development of public production, for the economic and social progress in the world, and in the spirit of the neoclassical lines in the economic theory, the “human capital theory” appeared, the founders of which are the American economists T. Shultz, S. Bowles, G. Becker, etc.

[1] The article is part of a work on a joint project “Investments in intangible assets and economic growth” of research fellows at the Institute of Economics at the Bulgarian Academy of Sciences and the Macroeconomics Department, University of Antwerp, Belgium. The research is financed by FWO (Belgium).

The term "human capital" is an expression of the "aggregate of knowledge and skills…, leading to an increase in…productivity"[2]. Education is a key to acquiring and improving the quality of human capital. The better educated and trained labour force is able to produce more and of a higher quality. And this is not all. The higher the level of education, the bigger the potential for development of science and technology, and for their faster application into practice.

In the third edition of the book "Human capital"[3], G. Becker analyses the relation between the human capital formation and the sources of economic growth, and he makes the conclusion that the increase in knowledge is closely connected with the investments in new technologies and fundamental investigations; the better the knowledge, the better the opportunities to invest in it.

The contemporary socio-economic transformations in society have led to the appearance of new economic theories, like those of the superindustrial society and knowledge-based economy. The revolution in information technology and the development of information technics, the conversion of innovations into one of the main factors of competitiveness have put on the agenda the question of the growing importance of knowledge and human capital. At present, a number of economists treat knowledge, information and innovation activity as production processes and put the accent on the fundamental change of the economy from industrial to *knowledge-based*. The key to the success in a knowledge-based economy is the educated labour force.[4]

During the last decade, the fact that the economic growth can not be explained completely by the growth in physical capital, set the pattern for a number of investigations, as a result of which a new broader conception of capital formation occurs: in the investment expenditures are included also those on education and training, R&D, marketing, reorganisation of production, etc. Thus, a new terminology appears: *intangible* investments and *intangible* assets.

A series of studies on the total amount of intangible investments in the USA during the last century show a significant increase, especially in the resources allocated toward education, training, and R&D. A result of the growth in intangible investments is the significant increase in intangible capital. For example, the share of the conventional *material* capital in the American economy decreases from 65% in 1929 to 46.5% in 1990[5]. The share of the *intangible* capital grows respectively to 53.5%. Although the evaluations of various researchers differ to a certain extent, the common conclusion is that at present in the USA the economic weight and the influence of the intellectual capital are greater than those of the *material*.

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[2] *Frantz, W*. The Labour Market. Sofia, 1996, p. 107.

[3] *Becker, G*. Human Capital, third edition. New York, 1993, p. 312.

[4] *Stiglitz J*. Public policy for a knowledge economy. The World Bank Group, 1999, http//www.worldbank.org/html/extdr/extme/jssp012799a.htm

[5] *Mortensen, J*. Intellectual capital: economic theory and analysis. – In: Competitiveness and the Value of Intangible Assets. UK, 2000, p. 8.

In the 1990-ies the American economy is characterised by a substantial increase in production, labour productivity and employment of highly qualified workers. A number of researchers determine all these as a result of the fact that the USA is a leader in innovations and implementation of new technologies.[6] The interrelation between the investments in new technologies and in human capital is considered to be the generator of these positive changes in growth and of the dynamics of technological progress. Technological changes have a positive effect on the increase in production as well as on the incomes and investments in human capital. The higher quality of human capital has in turn a positive effect on knowledge development, on working out more productive technologies, and on their more effective implementation.

International comparisons show that in the second half of the 1990-ies the USA is characterised by higher income inequality, by more investments in technologies and by more significant increase in production and productivity compared to other economically developed countries (like Canada, France, Germany, the United Kingdom). The implementation of new technologies has a strong influence on the productivity of qualified workers with all the resulting effects on incomes and investments in human capital. In this connection important is the meaning of the corresponding policies, including those concerning incomes, taxes, education, etc., for the allocation and regulation of these influences and interactions. For example, in the USA and in the United Kingdom are observed an increase in production and significant investments in technologies together with a higher inequality in incomes, while in Canada there is no such considerable inequality, though it is a developed country characterised by a high level of implementation of new technologies and an increasing demand for highly qualified labour. The large expenditures on education, the subsidies for it can explain the more favourable conditions in the country for acquiring higher level of qualification and for implementation of new technologies in comparison with most of the economically developed countries. The policies, stimulating education and training through subsidies, have a significant impact on accumulation of human capital as well as on growth of production and productivity as well as implementation of new technologies.

A characteristic feature of the economically developed countries during the last decades is the decrease in the ratio: capital investments / GDP. In the context of the knowledge-based economy this fact can be explained not by a total decrease in capital formation in enterprises, but by a reallocation of more resources to investments in intangible assets. Due to the fact that from the point of view of accountancy the investments in intangible assets have not been accounted as capital formation, this change in companies' behaviour has remained unnoticed for a long time by politicians and theoreticians, alike.

[6] For example see *Kaufman, M., R. Luzio, S. Dunaway.* Returns to human capital and investment in new technology. IMF Working Paper, 2001.

Over the last years a number of studies and documents of international organisations have been directed at defining and structuring intangible assets. Although there is still no unified classification, the different views have moved closer. The International Accounting Standards Committee (IASC) gives the following definition of intangible assets: “non-monetary assets without physical substance held for use in the production or supply of goods and services, for rental to others, or for administrative purposes: a) that are identifiable; b) that are controlled by an enterprise as a result of past events, and; c) from which future benefits are expected to flow to the enterprise”.[7]

One of the most recent OECD studies offers the following structure for intangibles: 1) human resources; 2) R&D, technology and innovation; 3) organisation structures and innovations; 4) marketing, and; 5) software.[8]

With the transition from an economy based on capital intensive production to an economy dependent to a greater extent on the development of technology and knowledge, investments in intangible assets have become far more important. They are the basis for the development and implementation of knowledge, for innovations and production, for the use of new technologies.

At macrolevel, investments in intangible assets related to knowledge include first of all expenditures on R&D, investments in software products and public expenditures on education. The size of these investments, although limited, amounts to some 8% of the GDP in the OECD.[9] If to these expenditures are added companies’ expenditures on education, training, organisation and market development, where there are no data on national level, the total expenditure will exceed 10% of the GDP.[10] Since the middle of the 1980-ies the growth of investments in intangible assets has been larger than that of the GDP in the OECD.

The fact that knowledge is a driving force for technical change and technological progress has been familiar long since. In the contemporary conditions, however, as a factor for economic development it acquires a growing importance. “The production, diffusion and use of technology and information are key to economic activity and sustainable growth. This is of course not new, but the role of knowledge (as compared with natural resources, physical capital and low-skill labour) has taken on greater importance. Although the pace may differ, all OECD countries are moving towards a knowledge-based economy.”[11]

This statement is based on a number of aggregated measures:

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[7] IASC. Proposed International Accounting Standard. Intangible Assets. Exposure draft E60, International Accounting Standards Committee, London, 1997.

[8] OECD. Strengthening the incentives for employers to finance human resource development. DEELSA/ED, 1997

[9] See *Vickery, G*. Accounting for intangibles: issues and prospects. – In: Competitiveness and the Value of Intangible Assets. UK, 2000, p. 73.

[10] Ibid.

[11] OECD. The knowledge-based economy: a set of facts and figures. Paris, June 1999.

- the share of the aggregated sectors formed by *knowledge-based* productions and services in the value added is 50% in the middle of the 1990-ies in the OECD (these are sectors with very active R&D, with a high degree of ICT implementation and/or a significant share of highly qualified workers);
- the value of high-tech exports from the OECD countries has been substantially growing in the last decade with rates of growth higher than in all other productive spheres. For the period 1990-1996 the exports of high-tech goods and of the so-called medium-tech goods (automobiles, chemicals, etc.) has grown at an annual rate of 7% (compared to 5% for all other kinds of goods);
- investments in ICT amount to 7% of the GDP on average for the OECD countries (USD 1.6 trillion in 1997);
- in the structure of the employed, significantly grows the share of those with a high level of education and qualification. The quality of human resources is the basic factor for the invention and dissemination of technology. The level of acquired education is one of the most frequently used indicators of human capital, notwithstanding its imperfections like non-inclusion of the quality of education and training.

The human capital as a main element of intangible assets and its quality are some of the most important factors for economic growth and competitiveness. Without the availability of educated and qualified labour force economic and social development can not be attained. Education and training are the main channels for spreading knowledge. They are not only a main source and basis for R&D, but also means of transformation of technological change into economic growth. Some of the indicators characterising the education system and directly connected to the innovation system are: school education in science and engineering, share of students in the 18-24 age group, degree of qualification of the labour force, etc. The acquisition of high-level knowledge and skills is a long-term process that also requires significant investments in the education infrastructure.

Comparative characteristics and evaluation of human capital in Bulgaria

The results of the comparative analysis of the main indicators characterising human capital in Bulgaria, in EU candidate countries and in economically developed countries, outline the state and the qualitative changes in the country's human capital as well as the main problematic areas to which policies have to be directed in the future, in order to create favourable conditions for attaining accelerated and sustainable growth and raising the competitiveness of the economy.

Characteristics of human capital

Due to the difficulty in measurement, the indicator most frequently used in practice is the structure of the population by level of education, including higher education.

The statistical data show the presence of a good educational structure in Bulgaria from the human capital quality point of view: 60% of the population of 15 years of age and over and 80% of the labour force have completed secondary and higher education at the end of 2002 (Fig. 1).

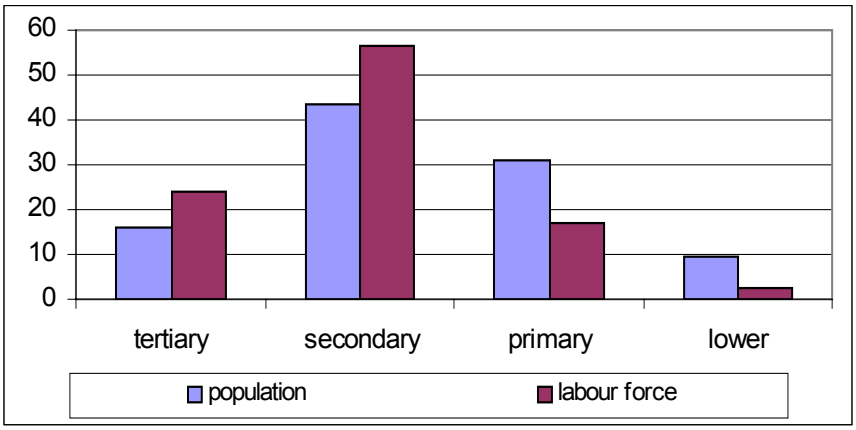

Fig. 1. Share of population of 15 years of age and over and of labour force by level of education* (%)

* As of December 2002.

Source. NSI. Employment and Unemployment. 2002, N 4.

According to international statistics[12] the share of illiterates in the population of 15 years of age and over is 1.5% in 2001 which is some 0.5-1% higher than in economically developed countries as well as in Central European countries.

The indicator for the share of the population aged 25-64 years with secondary and higher education in Bulgaria (67.1%) is larger than the corresponding indicator for the EU-15 (63.5%) which is an evidence of the relatively *high quality of human capital* in the country (see Fig. 2). The indicators for the most developed EU countries and also for the USA, Canada and Japan are some 15 percentage points higher, i.e. it is around and above 80%.[13] Higher than the Bulgarian, however, are also the respective indicators in the other EU candidate countries although by less percentage points. A phenomenon with a *negative potential* for the future change in the quality of human capital in Bulgaria is the *lower value of the indicator for the population of the 25-29 age group* both vis-à-vis the average EU indicator and vis-à-vis the indicators in the other candidate countries.

[12] See UNDP. Human Development Report, 2003.

[13] See Education at a Glance, OECD Indicators. OECD, 2001.

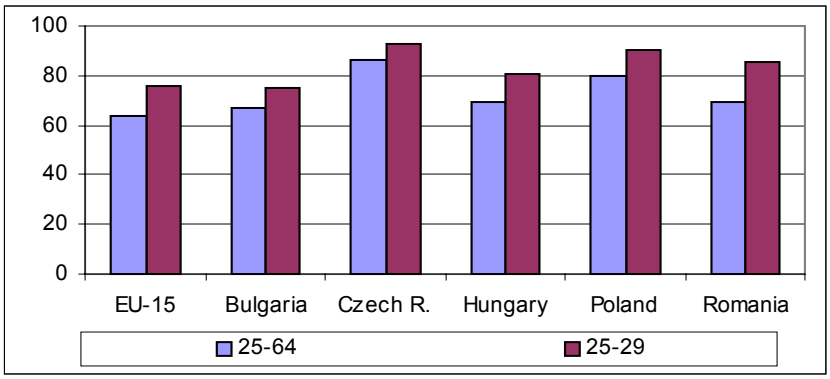

Fig. 2. Share of the population of 25-64 years of age with a completedsecondary and higher education (%), 2000

Source. Eurostat Yearbook, The Statistical Guide to Europe, 2002.

As in the economically developed countries, in the last decade there is a tendency in the country to a substantial growth in the number of students: by more than 60% with a peak in the 1998/1999 school year. Afterwards, however, there is a decline (Fig. 3). Notwithstanding the increase, Bulgaria still lags behind the EU countries according to the indicator "students per 10,000 of the population". For the EU-15 on average it is 336, while for Bulgaria it is 280. If the declining trend in the number of students that started at the end of 1990-ies continues, the value of this indicator may decrease despite the decreased total number of the country's population. This would be unfavourable with respect to the future change and rise in the quality of human capital.

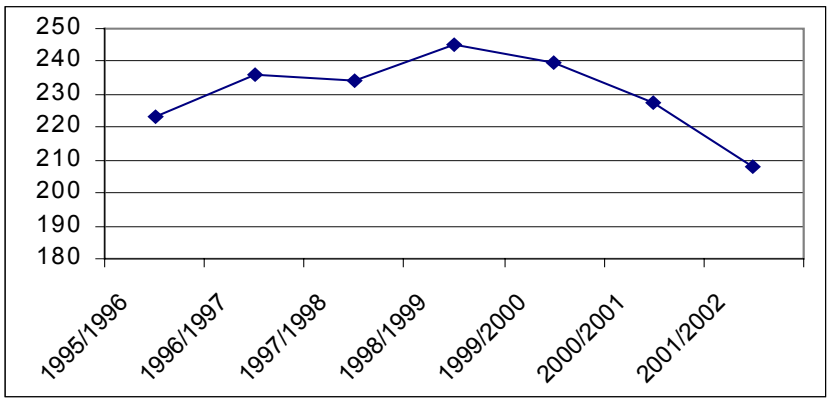

Fig. 3. Total number of students in Bulgaria (thousands)

Source. NSI, Statistical Reference Book, for the Corresponding Years.

The emigration processes exert substantial influence on the human capital of a country and are a way of its formation. If the emigrants' knowledge and skills accumulated abroad are used for GDP growth in their country, then emigration has a positive influence on the quality of human capital therein. However, if this quality is realised abroad or the quality formed in the native country is used for the increase in the GDP of another country, then emigration has a negative effect both upon human capital and the country's economic development.

After the initial wave of emigration from Bulgaria at the end of the 1980-ies and the beginning of the 1990-ies, the number of Bulgarian emigrants has stabilised and varies between 55 and 65 thousand per year. More substantial, however, is the fact that among those people the share of the highly educated is large. According to the Centre for investigation of democracy data,[14] based on an inquiry, for the period 1988-1995 the country was left by 6,000 scientists, or about 11% of the total number of those that left jobs related to science, and almost half of them were in the 35-49 age group. The largest share is that of those who worked in the sphere of technical sciences (around 73%), the most affected scientific areas being automation, electronics and electric engineering, machine engineering.

The data from the results of inquiries on potential emigration from the country are not more favourable.[15] They show that at the beginning of 2001, 25.3% of all Bulgarian citizens aged 18-60 and 43% of young people of 18 to 30 years of age have declared intentions to emigrate. Of the inquired, 55% of those with secondary education and 23% of those with higher education are potential emigrants. In comparison with the data from the 1992 and 1996 inquiries the number of the persons that do not intend to emigrate has decreased from 70-76 to 66%. At the same time, more parents (over 72% of the inquired in 2001) manifest their desire to encourage their children to leave the country.

At present Bulgaria possesses human capital of a relatively high quality: a low level of illiteracy, a relatively large share of population with secondary and higher education, a growing number of students – a tendency analogous to that in economically developed countries. Some phenomena are outlined, however, that contain a potential for negative future changes: a relatively lower education level of young people of the 25-29 age group, a decrease in the number of students in the last years, a relatively high emigration of young and highly educated persons.

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[14] Centre for Investigation of Democracy. Migration, European Integration and Brain Drain from Bulgaria. Sofia, 1996.

[15] International Organization for Migration. Profiles and Motives of Potential Migrants from Bulgaria. 1992, 1996, 2001.

Formation of human capital in the education system

Departing from the definition of human capital it can be said that it is formed mainly through education. Several are the basic indicators used in international practice that characterise the formation of human capital through education.

• *Participation in education*

The duration of compulsory school education in Bulgaria is one year shorter than in most EU countries and equal to that in most of candidate countries. The participation rate in pre-school education in the country, however, is significantly lower compared to the rates both in the EU and in candidate countries (Fig. 4).

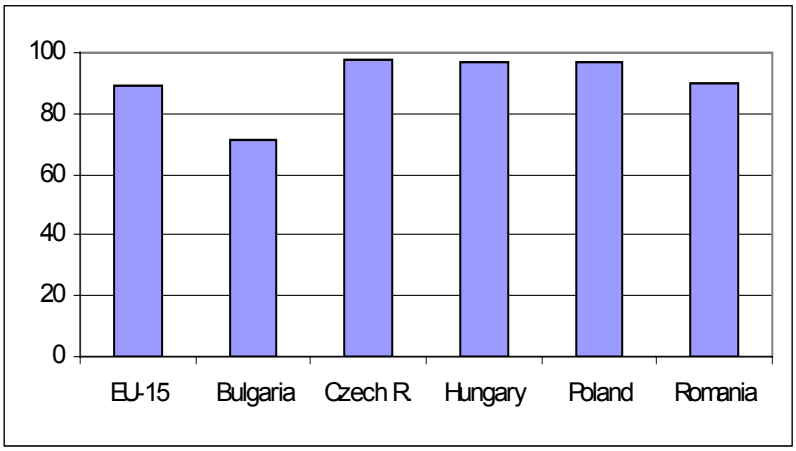

Fig. 4. Participation rate in pre-school education 1999-2000*

* For EU-15: 1998-1999.

Source: For EU-15 - Eurostat Yearbook. The Statistical Guide to Europe, 2002; for candidate countries - Eurostat, Statistical Yearbook on Candidate and South-East European Countries, 2002.

This phenomenon significantly hampers the adaptation of children to the real learning process. A positive step in that direction is the sanctioning of one-year pre-school education as compulsory.

An unfavourable fact is the low enrolment rate even in the compulsory levels of education, which limits the potential for rise in the quality of human capital in Bulgaria. Worrying is the situation in secondary education where more than 1/3 of children do not get involved in the education process (see Fig. 5). Other is the problem concerning the quality and adequacy to labour market demand of education.

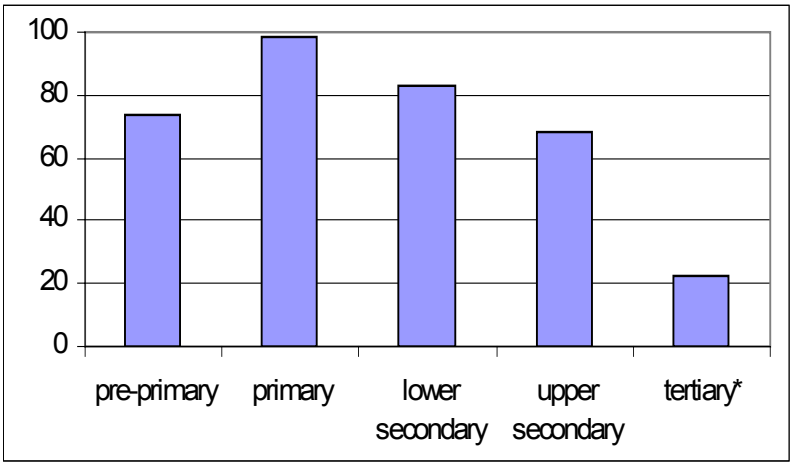

Fig. 5. Net enrolment rate by level education (ISCED '97)
for 2001-2002 school year

* Bachelor's and master's degree.

Source. NSI. Statistical Yearbook, 2002.

The participation rates in education of young people of the 16-24 age group in Bulgaria are significantly lower than the respective rates in EU countries and in most candidate countries (see Fig. 6). The low participation in secondary education at present leads to the necessity of wide-spread progress in the system of *life-long learning* which is not well-developed in the country now.

All these data clearly indicate that though Bulgaria possesses human capital of a relatively high quality, the potential for its future growth encounters limits. The low participation of young people in secondary education is the most unfavourable phenomenon in this respect.

A little better is the situation in the sphere of higher education. According to international statistics the participation rate of young people therein is lower but closer to that in developed countries and higher than the respective indicators in candidate countries. Since the beginning of the transition period the number of students in Bulgaria marks an uninterrupted trend towards significant growth till 1999 and then starts to decline. The reasons therefor lie in the number of normative and administrative imperfections, in the limitation of the financial means of the population, in the decrease in the participation of young people in secondary education, etc.

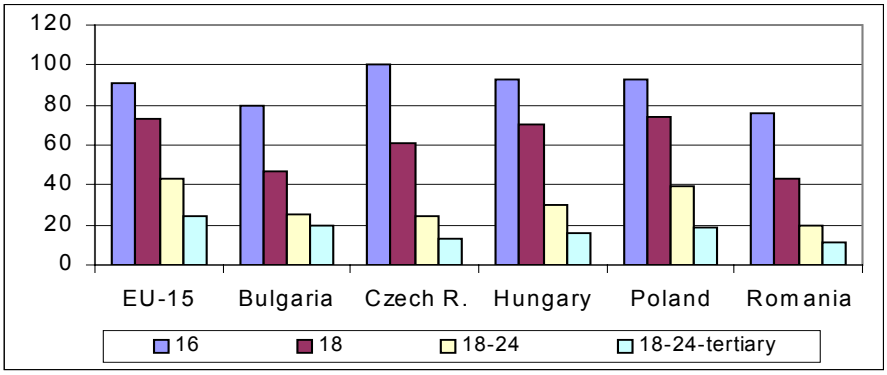

Fig. 6. Participation rate in education of the population aged 16-24 (1999-2000)

Source. Eurostat, Statistical Yearbook on Candidate and South-East European Countries. 2002; higher education data - Eurostat Yearbook. The Statistical Guide to Europe, 2002.

• *Education by subjects*

Another indicator by which Bulgaria lags behind the economically developed countries is that of the share of students educated in *science and engineering*[16] (Fig. 7).

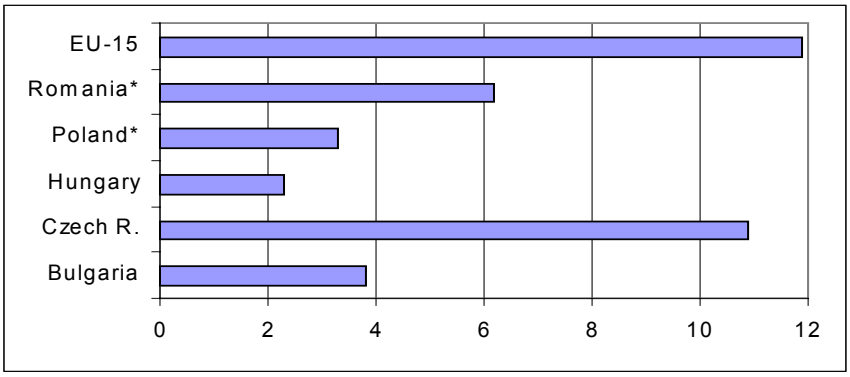

Fig. 7. Share of graduates in tertiary education in sciences, mathematics and computing – 2000 (% of total)

* Excluding postgraduates.

Source. Eurostat. Candidate Countries in Facts and Figures. June 2002.

[16] According to European Innovation Scoreboard, 2002, here are included all students in the areas of : life sciences, physical sciences, mathematics and statistics computing, engineering and engineering trades, manufacturing and processing, architecture and building

The value of this indicator in the country is by about a third lower than that in EU countries and is smaller than the values in a number of candidate countries. This is a substantial indicator characterising the potential of human capital nowadays to develop and implement new technologies.

• *Expenditures for education*

The expenditures for education in Bulgaria as a share in the total expenditures of the consolidated state budget and also as a percentage of the GDP are very limited. Their level at present still cannot reach that of the beginning of the transition period (Fig. 8). In comparison with the developed European countries these expenditures are several times smaller both in relative and absolute terms. The expenditures per student in Bulgaria are 10-20 times less than in the economically developed countries and continue to decline. Indicative in this respect are the data on the ratio "expenditures per student / GDP per capita" which decreases from 42% in 1991 to 22% in 1998.[17] The insufficient financial resources are another substantial limit to the development and improvement of the quality of human capital.

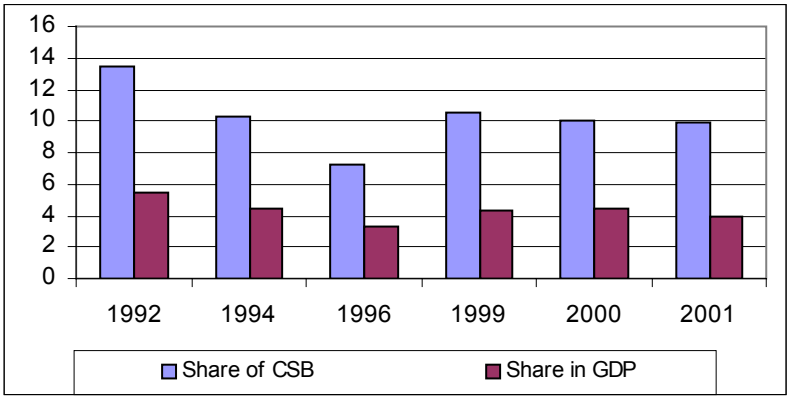

Fig. 8. Share of expenditures for education in the total expenditures of the consolidated state budget and in the GDP (%)

Source. NSI. Statistical Yearbook for the Respective Years.

• *Continuous training*

This training which is aimed at compensating education gaps and continuous perfection of the quality of human capital, in accordance with the new necessities of the economy and the demand on the labour market, is not sufficiently developed in Bulgaria. According to data from a Eurostat survey[18] of

[17] OECD. Thematic Review of National Policies for Education – Bulgaria. 2002.

[18] For more details see Joint Assessment of Employment Priorities in Bulgaria, October 2002.

continuous vocational training, in 1999 about 13% of all employed persons and 46% of the total staff of enterprises that provide for training have participated in training courses. Only 28% of all enterprises in the country, however, provide for such training of their personnel.

A larger part of employers do not consider training as a priority. The reasons for that lie in the unfavourable financial situation of enterprises and the shortage of means for training as well as in the lack of motivation in employers and availability of unemployed qualified labour force on the labour market. In the new Law on employment promotion, one of the measures is directed at "maintaining and raising the qualification of the employed". The interest of employers toward this measure, however, is not big because of the low financial incentive. In 2002 this preferential regime is used for only 5 persons.

Not better is the situation in the training of the unemployed. The share of the unemployed included in or completed training courses is minimum (Fig. 9), and so are the resources earmarked for this purpose. In 2002 only 2.8% of the expenditures for active measures are allocated to training, and the share of the persons that have completed training courses is only 2.7% of the total annual average number of the registered unemployed. This percentage is lower than the respective indicator at the beginning of the transition period.

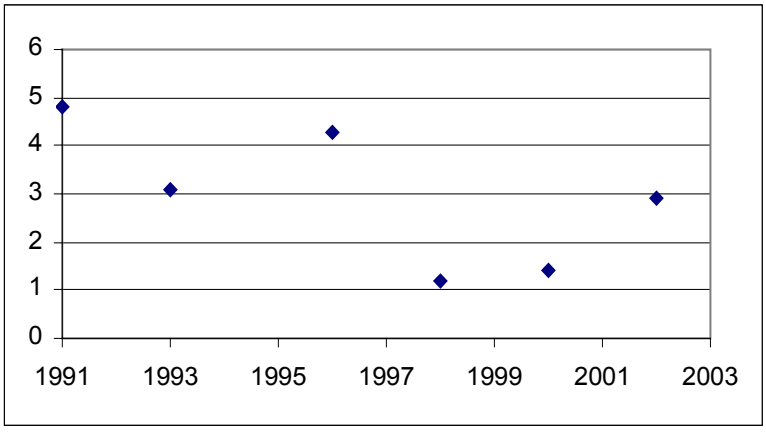

Fig. 9. Share of registered unemployed included in training courses (%)

Source. Employment Agency at the MLSP.

Most of the indicators outline an unfavourable picture of the formation and future evolution of human capital in Bulgaria: a relatively low enrolment and participation ratios in education, an insufficiently developed continuous training, limited expenditures for education and training, a relatively low share of the trainees in perspective (with a view to global trends of economic development) scientific and technical fields of knowledge.

• *Utilization of human capital*

According to human capital theory there is an inverse proportion between the levels of education and of unemployment, i.e., the higher the education, the lower the unemployment. The example of Bulgaria proves the truth of this statement (Fig. 10). It is important, however, not whether one can find or not a confirmation of one or another theoretical postulate in the country, but the fact that in the utilization of human capital of a higher quality there is a potential for growth in the GDP and in productivity, for development and more efficient application of science and modern technologies.

Fig. 10. Share of employed and unemployed by education* (%)

* As of December 2002.

Source. NSI. Employment and Unemployment. 2002, N 4.

The use of high quality human capital in Bulgaria corresponds to global tendencies. The problem is in the fact that it does not find application in high-tech production and services (Fig. 11). In other words, it is not utilized rationally and efficiently with a view to the future development and competitiveness of the economy.

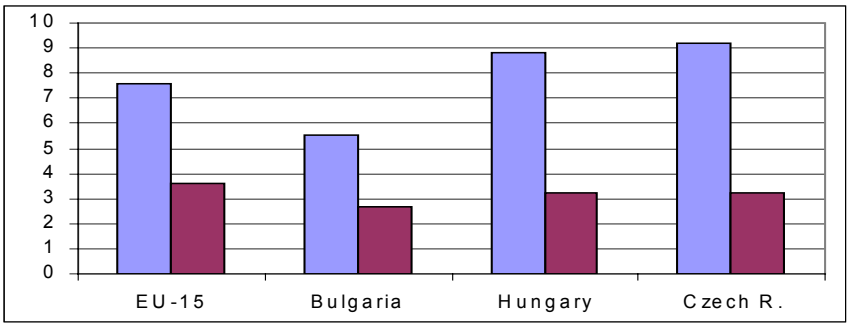

Fig. 11. Employment in medium-high and high-tech production and in high-tech services (% of total labour force)

Source. European Innovation Scoreboard, 2002.

A general idea of the efficiency of the use of human capital nowadays is given by the indicators of the state of:

- *Research and development*

According to statistical data the potential for improvement and efficient utilization of human capital in Bulgaria is limited. An important indicator in this case is R&D expenditures. In 2001 the share of expenditures on scientific research in the total consolidated state budget expenditures is only 0.8% which is 0.3% of the country's GDP. (The share of government expenditures for R&D covers almost ¾ of the total amount of these expenditures in the country.)

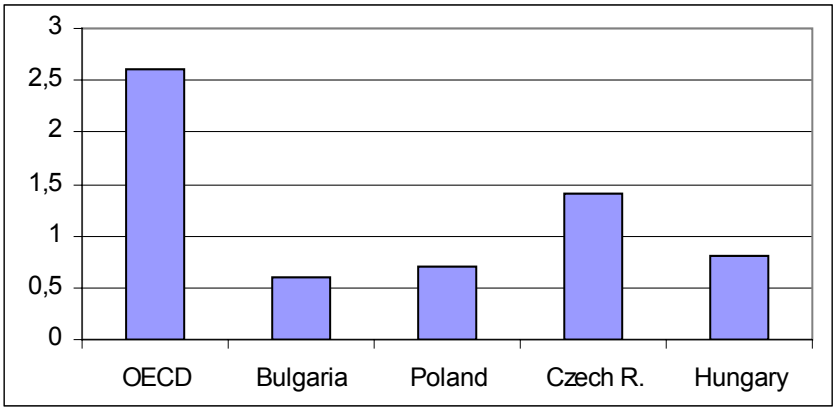

Fig. 12. Expenditures on R&D as % of GDP

Source. UNDP. Human Development Report, 2003.

Public expenditures for R&D (as a percentage of GDP) in Bulgaria are around 60% of the EU-15 average indicator, but the expenditures of enterprises do not reach even 9% of the respective average indicator for the Union.[19] According to the indicator for R&D expenditures as a percentage of GDP, Bulgaria significantly lags behind the economically developed countries and most of the EU candidate countries (Fig. 12).

One of the important signs of inefficient utilization of the quality of human capital in the country, besides the limited R&D expenditures, is the decreasing number of scientific workers. Only for the period 1997-2001 there number has declined by more than 3.5 thousand people. According to international statistics the number of R&D scientific personnel per million inhabitants in Bulgaria, although close to the respective indicators for Central European countries and higher than those in a number of EU candidate countries, is half the OECD average indicator and about 1/3 of that for the most developed countries (Fig. 13).

[19] See European Innovation Scoreboard, 2002.

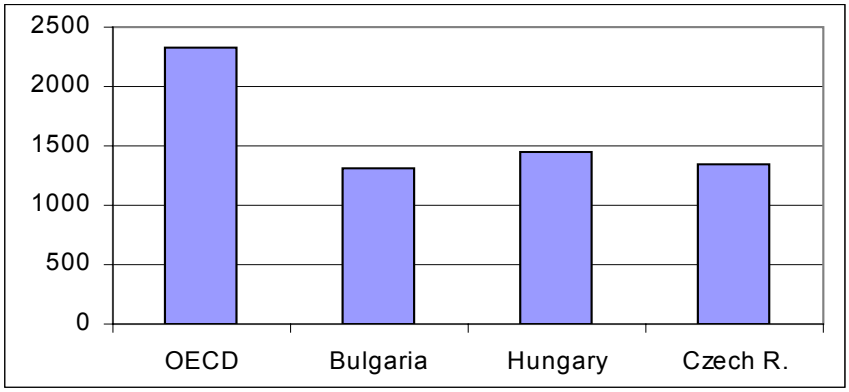

Fig. 13. R&D scientific personnel (per million inhabitants)

Source. UNDP. Human Development Report, 2003.

- *Information and communication technologies*

In the present conditions of economic and social development ICT gain an increasing importance. They influence the formation and development of human capital as an element of intangible assets. At the same time their improvement depends to a large extent on its quality. The expenditures for the development of ICT and their utilization are among the important indicators in international statistics. The value of the indicator for the expenditures for these technologies in the country is below 48% of the average in the EU (Fig. 14).

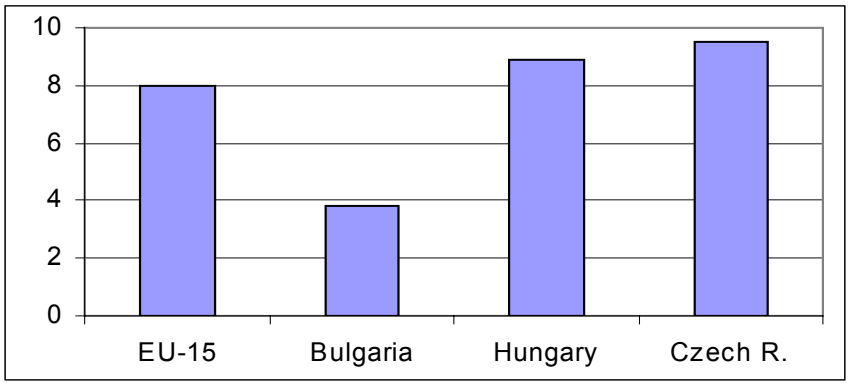

Fig. 14. Expenditures for ICT (% of GDP)

Source. European Innovation Scoreboard, 2002.

With the growing role and expansion of ICT of great significance is the use of the Internet by the population. Also according to this indicator Bulgaria substantially lags behind both economically developed countries and most EU candidates (Fig. 15).

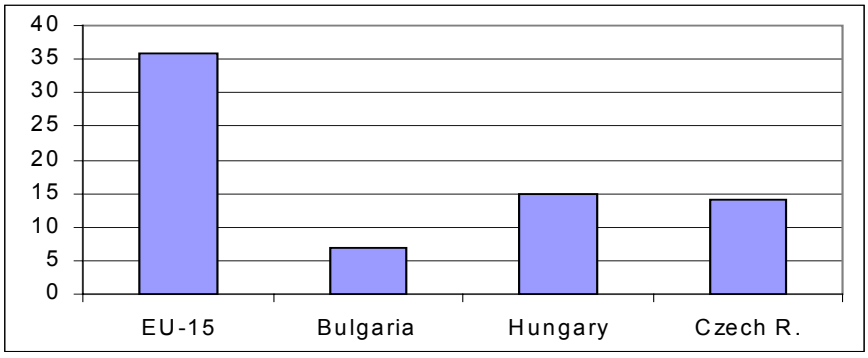

Fig. 15. Internet users per 100 of population

Source. Eurostat. Towards an Enlarged European Union. April 2003.

• *Patents and high-tech exports*

A direct result of the efficiency of the use of human capital, of the limited R&D expenditures, and of the decreasing number of scientific workers in the country is the small number of patents registered and submitted for registration to the EPO. The value of the indicator for the number of registered patents per million of the population in Bulgaria is below 10% of that of the OECD average indicator (1999).[20] The number of patents submitted to the EPO for registration is only 2% of the EU average (Fig. 16).

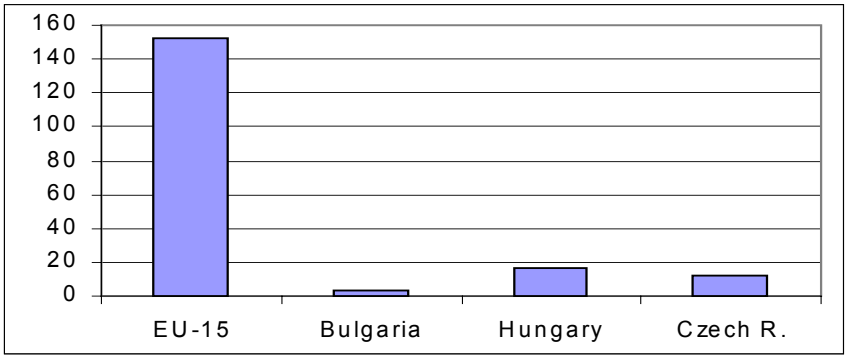

Fig. 16. Patents submitted to the EPO for registration per million of the population – 2000

Source. European Innovation Scoreboard, 2002.

[20] See UNDP. Human Development Report, 2003.

An idea of the efficiency of the use of human capital can also be acquired from the participation of the country in international high-tech markets. The indicator for the share of high-tech exports in total exports for Bulgaria is 11 times smaller than the respective average indicator for OECD countries and it is also smaller than the indicators for most EU candidate countries (Fig. 17).

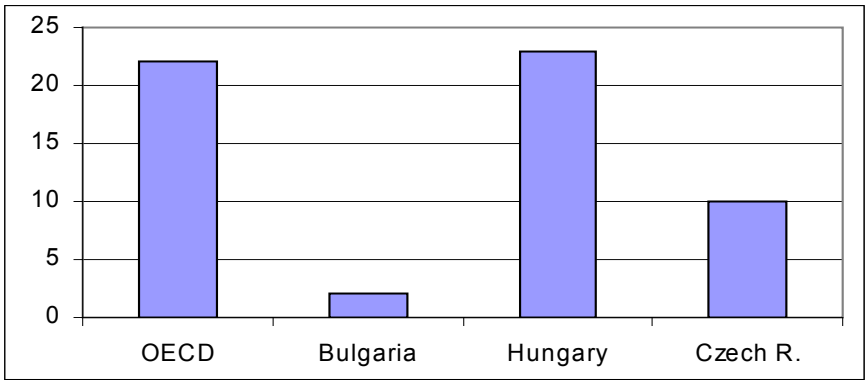

Fig. 17. Share of high-tech exports in total exports of goods (%)

Source. UNDP. Human Development Report, 2003.

Characteristic for Bulgaria is the use of human capital of relatively high quality, but irrationally with respect to the competitiveness of the economy and with a low effect with respect to the participation of the country in international high-tech markets. At the same time the potential for rise in the efficiency of its utilization decreases.

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A the present stage of social and economic development intangible assets acquire growing importance as key means of increasing the competitiveness of the economy. The *knowledge economy* requires substantial attention to science and education, as economic growth to a larger extent depends on intellectual potential, on development and application of new modern technologies, on human capital and its quality.

In the conditions of intensive globalisation and integration processes, larger importance is attributed in economically developed countries to the issues of growth, employment, and improvement of the quality of the labour force. Bulgaria cannot stay apart from the global processes and trends. At the same time it is in the condition of substantial social and economic transformations accompanied by significant hardships in all spheres of social life, the overcoming of which imposes a rise in investment in intellectual areas.

The world experience shows that during significant social transformations or for getting out of economic crises these areas become of primary importance.

Bulgaria is a small country with limited resources and the human one is its main wealth. A number of researchers prove that small countries that lack the necessary resources and means for R&D have to direct their efforts and policies at identifying technological niches in which they may specialise, to encourage participation in international co-operation, in order to compensate for their limited abilities, and to adopt selective policies directed towards improvement of the conditions for application of modern global and own scientific and technical achievements.[21] Such policy would have to be applied also by Bulgaria, but its implementation depends on the available human capital and on the perspectives for its performance.

Today in Bulgaria human capital has relatively high quality, but also a continuously decreasing potential for future development. Unfavourable tendencies are outlined in the fields of its formation and effective utilization. These negative phenomena would be a serious barrier to the future social and economic development of the country, to its competitiveness, and to its accession to the EU, if no urgent, adequate, and purposeful measures and policies for the creation of necessary conditions for maintaining a high quality of the human capital and for its rational utilization are undertaken.

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[21] See for example The National Innovation System of Belgium. Editors Capron, H., W. Meeusen. New York, 2000.