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HUMAN RESOURCES DEVELOPMENT OF REPUBLIC OF CROATIA AND PRIMORSKO- GORANSKA COUNTY AND THEIR INFLUENCE ON ECONOMIC GROWTH*

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Abstract: In the theoretical part of research authors will establish connections and diversities between human capital and human resources categories. In the empirical part of research, via HDI, it will be evaluated the development of human resources in Republic Of Croatia and in Primorsko-goranska County and in will be evaluated relation between HDI and GDP per capita of Croatia and in Primorsko-goranska County. Authors will also analyze how much development of human resources has contributed to the economic growth of Republic Of Croatia. In order to demonstrate this it will be measured influence of investment, employment and educational structures (the indirect indicator of development of human resources) on the growth of GDP in the period of 1997-2005 with usage of regression analyses.

Key words: human resources, economic growth, development.

1. THEORETICAL-METHODOLOGICAL APPROACH TO THE RESEARCH PROBLEM

In scientific and professional literature which explores the significance and contribution of the human factor in production and development of a company, local or

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regional communities or national economies, the terms „human capital“ and „human resources“ are used most frequently. These terms are often identified and used as synonyms. Regarding the historical course of exploring and measuring the value of investments in people, and values which people, by working, bring into the business process, as well as their contribution to the creation of a new value, it can be concluded that these two terms should be differentiated. The fact is that the value of investment in people by education and health care (these investments cause individual and public expenses) should be distinguished from people's contributions to the creation of new values by bringing their psychophysical abilities into the business process. These psychophysical abilities are the result of investments in people, and their contribution to production does not solely depend on the value of human capital, but also on organisation of the business process, management of production factors and human resources effects in the company.

In terms of history, on macro level, most attempts to measure the value of human capital were focused on cost approach. A. Sauvy developed a method (Sauvy, A., 1952) for the calculation of human capital value which consists of expenses for support and education of a person up to his/her working age. The main representative of the Chicago school, the Nobel Prize winner T. W. Schultz, based the estimates on cumulation of investments in the components of quality, i.e. in their improvement (by education, professional training and health care), but he also included the lost income of people in the process of education, as well as various losses, caused by, for example, human mortality. (Schultz, T. W., 1985).

The content of the above-mentioned calculations points to the true meaning of human capital. It is a value invested into people (employees), primarily by education and health care, with the purpose of creating knowledge, skills and work abilities. Subject of research in economic literature is primarily investment into education, because it is more simple to establish its effectiveness from the individual's point of view and to compare it with effectiveness of investing in capital. Such calculation is far more complex when it comes to investments in health because investment effects are hard to quantify. However, the calculation of effectiveness of investments in education on macro level is also highly complex; having this in mind, one should the contribution of G. Becker should be emphasised, who conducted a cost-benefit investment analysis in secondary and college education in USA (Becker, G., 1964).

When a man, or people, bring their human capital into the business process, the capital becomes the key component of human resources.

Human resources is defined as totality of psychophysical abilities managed by companies which can use them for realisation of their business objectives. Whether human resources will indeed be used in the business process, and if so, how successfully, depends on the efficiency of the organisation, management of the business process, and on the function of human resources management, which act as catalysts of human resources activation. During active life, human capital can be increased by investments made in lifelong education and development of a learning company. At the same time, human resources are also increased by acquisition of new knowledge and skills, but also by promotion of employees, application of good motivation systems, i.e. a good combination of material and non-material

compensations, more successful combination of production factors and more successful management of these factors.

On national level, human resources can be defined as total psychophysical energy managed by a society, which can use it for realisation of its developmental objectives. At pre-working age, the society has a decisive influence on formation and development of human resources, primarily by education and health care, but also by other activities; i.e. social care for children, sports, cultural activities.

Unlike human capital, human resources cannot be expressed through value; their level of development is measured indirectly. Literature offers various criteria for assessment of human resources development in a particular area. It is established that the greatest breakthrough has been achieved by Harbison and Myers in „Education, Workforce and Economic Growth“ (Harbison, F., Myers, Ch, 1964), in which they elaborated on quantitative indicators for indirect measuring of human resources development, after having concluded that economists disregarded research of the human factor and its significance and contribution to economic growth, because of their inability to establish the input-output relationship which is indisputable in physical capital, because this capital is directly measurable in terms of value. By seven partial indicators, Harbison and Myers calculated the complex human resources development index. These indicators are: 1. number of teachers in primary and secondary education per 10,000 inhabitants; 2. number of engineers and scientists per 10,000 inhabitants; 3. number of doctors and dentists per 10,000 inhabitants; 4. inclusion of children from five to 14 years of age in primary education; 5. average enrollment rates in primary and secondary education; 6. percentage- inclusion of the population ranging between five and 14 years of age in secondary education; 7. percentage inclusion of the population ranging between 20 and 24 years of age in college education.

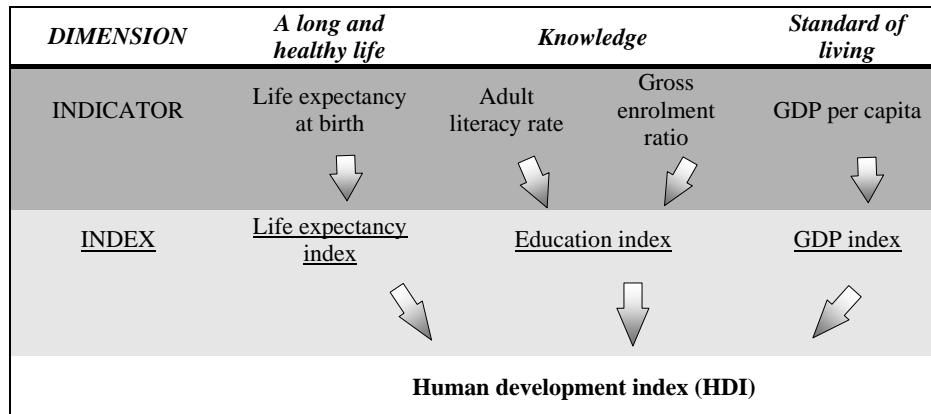
The OUN has recently been calculating the Human Development Index (HDI), which in fact, in terms of its content, represents human resources development index.² Namely, the OUN defines the human development concept in a wider sense; as development of people, development for the people and development by the people (Human Development Report, 1993). The HDI is calculated as a combined index of three indicators. They are: 1. life span and health condition of the population measured by the expected life span; 2. purchasing power of the population; 3. population's education level measured by the literacy rate of adults and by a combined indicator of the share of respective population groups in primary, secondary and tertiary education.

The authors believe that these three indicators satisfactorily describe human resources development on macro level, because the longer expected life span of the population implies better health condition, which results in better psychophysical abilities, i.e. in greater vitality of the people. Purchasing power of the population indirectly reflects higher or lower level of satisfaction of the needs, as well as the level of satisfaction and motivation of the employees. Also, it indirectly, although not precisely enough, (because the subject of consideration is GDP per capita, and not per

² The index was constructed at the beginning of the 1990s by Amartya Sen (Nobel Prize winner), Mahub ul Hak, Gustav Ranis (Yale University), Meghan Desai (London School of Economics) and has been used since by the OUN. It is published in annual Human Development Report

employee), reflects work productivity. In the end, the reached education level indirectly reflects the level of mastering knowledge and skills necessary for achievement of growth and development.

Scheme 1. Human development index



Source: authors; Human Development Indicators

However, in regard to the contribution of human resources to economic growth and development on macro level, it can be established that, in all the papers that have been published so far, it has been measured by the influence of the population's education level on economic growth, i.e. the subject of calculation is correlation between the achieved education level and the achieved GDP per capita.

Contemporary economics of the second half of the 20th century was marked by scientists' efforts to explain the difference between input and output, which has been marked as a residual in the production function. More and more economists have assigned the residual to contribution of knowledge and education (E. Denison, S. Kuznets, M. Reder, M. S. Visnjevic, B. Higgins, M. Adisesiah, S. Lebergot). However, especially significant is realisation that economic growth is influenced not only by quantitative, but also by qualitative components. In the classification of the source of growth, E. Denison claims that the output is not only influenced by the amount of work invested as input, because the output can be increased by investment in education and professional training, health care and professional mobility of employees. (Denison, E., 1972). The point here is investment in human capital. At the same time, Denison claims that the output also depends on allocation of resources; thereby, on allocation of human resources as well, i.e. on adequate assignment of employees to certain work places. In other words, in professional terms, Denison claims that the effects gained by human capital depend on the efficiency of human resources management.

Numerous economists in the second half of the 20th century clearly pointed out the significance of education and the level of education on national economic growth, as well as on prosperity of an individual. Harbison and Myers have established regularity which is manifested as the need for multiple growth of human resources development, in

order to achieve doubling of domestic income per capita. Regarded in the context of four degrees of economic development (first degree being the lowest, and the fourth the highest), the difference in domestic income per capita between first- and second degree countries at the beginning of 1960s was doubled; at the same time, countries of the second degree of development had seven times more developed human resources. The fourth group, i.e. the most developed countries, had up to 13 times higher domestic income per capita than the first group, and 38 times more developed human resources.

At the beginning of the 1970s, L. V. Stepanov (Stepanov, L. V., 1972) pointed out that American society, in accordance with the laws of world economic growth, creates the situation which will result in the rule of educated people, especially those with quality education, over the less-educated. At the beginning of the 21st century, it is evident that population's education has a great influence on developmental inequality between individual countries, and it also influences poverty and income inequalities within individual countries.

The richest countries in the world have the most educated population, and the poorest the most uneducated. Undeveloped countries make efforts to eradicate illiteracy, and the most developed countries have between a quarter and a third of highly educated population with a tendency that the number of highly-educated people in the next 10 years will have increased for more than 40%. For example, in 2005, the most undeveloped African countries (Benin, Senegal, Ethiopia) had the illiteracy rate of 75 to 80%, while the most developed high-income countries managed to eradicate illiteracy (World Development Indicators, 2007). In these countries, 70 to 92% of the population of relevant age group was covered by tertiary education (<http://go.worldbank.org/JVXVANWYYO>, 2/29/2008). Central and East European countries (Estonia, Hungary, Lithuania, Slovenia, Poland, the Czech Republic) had the illiteracy rate of 0,2% to 0,7% in the same year, and about 60% population of relevant age group was covered by tertiary education. Republic of Croatia had 1,9% of illiterate population, and in 2005, only 38,7% of the population of relevant age group was covered by tertiary education (<http://go.worldbank.org/JVXVANWYYO>, 2/29/2008)

Table 1. Countries classified according to the height of human development index in 1988 and 2005

1988.

	A	B	C	D	Total	%
H		3	18	23	44	35,8
M	6	41	3	1	51	41,5
L	22	6			28	22,7
Total	28	50	21	24	123	100,0

2005.

	A	B	C	D	Total	%
H	6	35	11	16	68	38,8
M	79	6			85	48,6
L	22				22	12,6
Total	107	41	11	16	175	100,0

Source: authors according to Human Development Indicators 1990, 2007/2008; Remarks: H – high HDI, M – middle HDI, L – low HDI; A – undeveloped countries, B- lower middle income countries, C – higher middle income countries, D – high developed countries

The Table shows undeveloped countries (A – GDP/pc < 905 USD), lower middle-income countries (B – 906-3595 USD GDP/pc), higher middle-income countries (C – 3596 – 11115 USD GDP/pc) and highly developed countries (D – GDP/pc > 1116 USD), classified according to the criterion of high (H – 0,80-1), medium (M – 0,50-0,80) and low (L – 0,0-0,50) human resources development index.

The comparison indicates that, in the period of 17 years, the share of countries with high human resources development index increased only by three percentage points, and the share of countries with medium human resources development index by 7,1 percentage points. In the observed period, the number of countries with low human resources development index was reduced by 44,4%. The Republic of Croatia was a medium human resources development index country by 1998 (HDI = 0,795) and was ranked 49th country according to human resources development level. Since 1999, the Republic of Croatia has been a high human resources development index country (HDI1999 = 0,803; HDI2000 = 0,809; HDI2001 = 0,818; HDI2002 = 0,830; HDI2003 = 0,841; HDI2004 = 0,846; HDI2005 = 0,850).

The table data lead to the conclusion that the countries which, according to their level of income per capita, fall into the medium- or low-income group, can have high human resources development index. Bolivia is often mentioned as an example; it is a low-income country with high level of human resources development (Human Development Indicators, 2004). Also, countries with equal incomes can be on different levels of human resources development (for example, Egypt and Jordan).

This means that human resources development can be sped up by well-defined economic policy, by greater availability of education, and by activation of local communities with the purpose of increasing the level of inclusion of the population in the educational process. However, in order to reach higher level of economic development, it is necessary to achieve exceptionally great progress in human resources development, as well as in their utilisation. (Harbison, F., Myers, Ch., 1964).³

In Table 2, components of the human resources development index are classified according to the countries' development level (high-, medium- and low-income countries), and according to the human resources development index rate (countries with high, medium and low HDI index).

³ Cf. p. 3; Four degrees of economic development

Table 2. Change of HDI-a, life expectancy index, education index and GDP index from 1998 till 2005

	HDI		LEI		EI		GI		Index 2005/1998			
	98.	05.	98.	05.	98.	05.	98.	05.	HDI	LEI	EI	GI
High HDI countries	0,90	0,897	0,87	0,854	0,96	0,922	0,90	0,915	98,7	98,1	96,0	101,7
Middle HDI countries	0,67	0,698	0,70	0,709	0,73	0,738	0,59	0,649	103,7	101,2	101,1	110,0
Low HDI countries	0,42	0,436	0,43	0,391	0,45	0,516	0,38	0,402	103,6	91,6	114,7	105,8
High income countries	0,92	0,936	0,88	0,903	0,96	0,937	0,91	0,968	101,7	102,6	97,6	106,3
Middle income countries	0,75	0,776	0,73	0,764	0,83	0,843	0,69	0,719	103,5	104,7	101,6	104,2
Low income countries	0,60	0,570	0,64	0,583	0,65	0,589	0,52	0,539	94,7	91,1	90,6	103,7

Source: authors according to Human Development Indicators 1990, 2007/2008; Remarks: HDI – human development index, LEI – life expectancy index, EI – education index, GI – GDP index

Table figures prove the thesis that the number of countries with low HDI has been on the decrease, but they also indicate that the poorest countries lag behind the most in human resources development, and that the biggest growth is not achieved by the richest countries, but rather by medium-income countries. However, this growth is insufficient to compensate the difference in developmental lagging measured by GDP per capita. Namely, in the medium-income group of countries, growth of the human resources development index primarily results from the growth of the expected life span index (growth by 4,7% in the period from 1998 to 2005). Countries with low human resources development index achieved its average increase by 3,6% in the period from 1998 to 2005, which is the result of improvement of educational structure of the population. At the same time, high-income countries increased their income per capita by 6,3% in the observed period, which increases developmental disproportions between the richest and the poorest countries, the income of which grows two times slower.

2. ANALYSIS OF HUMAN RESOURCES DEVELOPMENT IN THE REPUBLIC OF CROATIA AND PRIMORSKO-GORANSKA COUNTY AND THEIR INFLUENCE ON ECONOMIC GROWTH

As pointed out before, the human resources development index (HDI) is a composed index which measures life quality, literacy, education level and income per capita.⁴

Its purpose is establishing whether human resources of a certain country are, in fact, developed, in the process of development or undeveloped, but it also indicates the influence of economic policies on life quality (Davies, A., 2006). Index calculation

⁴ For calculation methodology of the HDI cf., for example: Human Development Report 2007/2008, UNDP, New York, 2007, p. 355, 356.

is complex, and Table 3 shows the results achieved by the Republic of Croatia and Primorsko-goranska County in 1997, 2001 and 2005, observing the expected life span index, human resources education level index, GDP index and human resources development index.

Table 3. Calculation of human development index for Republic of Croatia and Primorsko-Goranska County in selected years

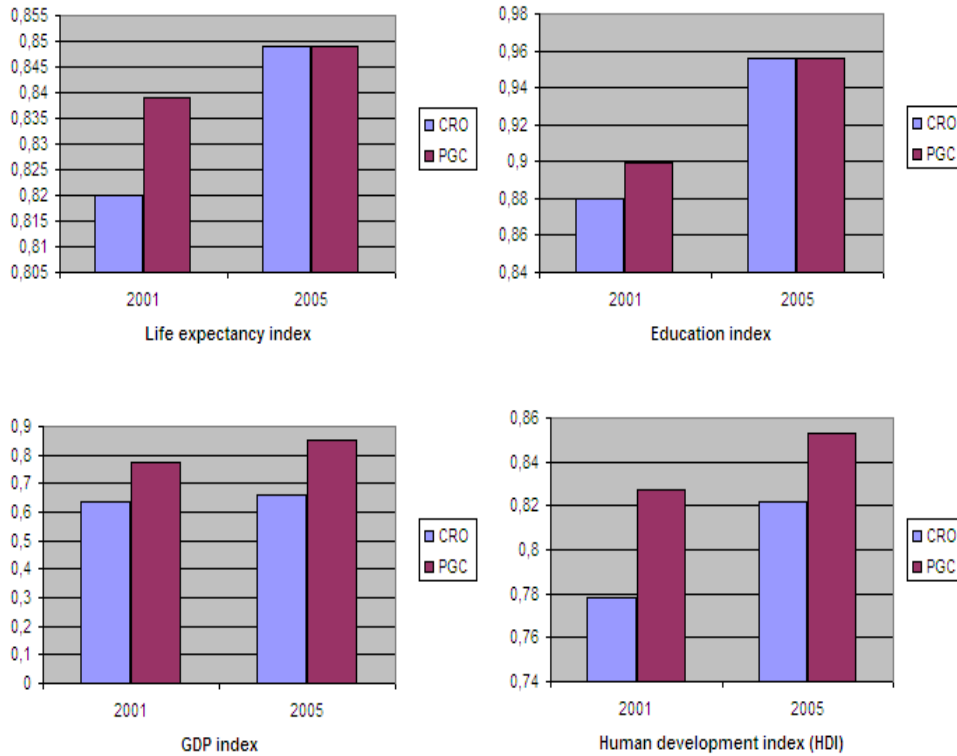
	Republic of Croatia			Primorsko-goranska county*		PG/RH ratio (RH=100,0)	
	1997.	2001.	2005.	2001.	2005.	2001.	2005.
Life expectancy (years)	72,6	74,0	75,30	75,95	75,95	102,6	100,6
Life expectancy index (LEI)	0,79	0,82	0,839	0,849	0,849	103,5	101,2
Adult literacy rate (%)	97,7	98,4	98,1	98,4	98,4	100,0	100,3
Literacy rate index	0,977	0,984	0,981	0,984	0,984	100,0	100,3
Enrolment ratio index	65,0	68,00	75,30	90,05	90,05	132,4	119,6
Education index	0,88	0,88	0,8990	0,9561	0,9561	108,6	106,3
GDP index	0,6315	0,6344	0,7748	0,6614	0,8526	104,2	110,0
Human development index (HDI)	0,7671	0,7781	0,8276	0,8221	0,8527	105,7	103,0

Source: authors according to SLJRH-2007., SLJPGZ-2007., Human development indicators 1999, 2003, 2007/2008

* Remark: HDI was not calculated for 1997 because of the data insufficiency

The expected life span in the Republic of Croatia in 2005 was 75,3 years. The Primorje-Gorski Kotar County has a slightly higher expected life span in relation to the Republic of Croatia, but the expected life span in comparison with 2001 is longer by one year. Although illiteracy has not been completely eradicated, neither in the Republic of Croatia, nor in the Primorje-Gorski Kotar County (1,9% of illiterates in the Republic of Croatia and 1,6% of illiterates in the Primorje-Gorski Kotar County in 2005), the human resources development index, which includes literacy of the population and their inclusion in primary, secondary and tertiary education, is higher by 6% in the County in relation to the Republic of Croatia. Greater inclusion of the County's population in tertiary education has had a crucial influence in this matter. The Primorje-Gorski Kotar County achieved USD579 per capita annually for consumption in 2005. Thus, it can be concluded that higher human resources development index in Primorje-Gorski Kotar County (0,8527) in relation to the Republic of Croatia (0,8276) is primarily the result of greater inclusion in education and greater production results per capita. But, if compared tendency of education index and GDP per capita, it is noticeable that positive deviation of County in the height of GDP per capita is diminishing faster and that it does not succeed in the development sense to use advantages in the human resources education in respect to the average of Republic of Croatia.

Graph 1. Life expectancy index, education index, GDP index and human development index in Republic of Croatia and Primorsko-goranska county in 2001 and 2005



Source: authors according to data from table 3

According to the OUN methodology, the Republic of Croatia, and by that, the Primorsko-goranska County, are included in the high human resources development group. However, regarding the differences between their HDI levels, it is evident that there are significant differences in human resources development between individual Croatian counties. If the level of HDI index in the Republic of Croatia were raised to the average level of Primorsko-goranska County, the Republic of Croatia would move up two places on the world human resources development list.

The influence of human resources development on economic growth will be estimated by means of regression analysis of each of the variables. The subject of research is to which extent the growth resulted from human resources development, and to which extent was it influenced by investments and the growth of employment rate. Considering the fact that the deviation analysis of variables, presented by a straight-line equation, which included the population's educational structure, is explained by a total of 0,9% in primary education and unexplained in secondary and tertiary education (due to the non-existence of the variance), the subject of research will be the influence of employee education level, rather than education level of the population.

Table 4. Investments, employment and employee education and GDP per capita in Republic of Croatia from 1997 till 2005

Year	GDP/PC. USD	Employee (tousand) (A)	Investments (mil. kn) (B)	% employee with primary education (C)	% employee with secondary education (D)	% employee with tertiary education (E)
1997	4398,2	1187000	31137,564	7,12	75,89	17,00
1998	4805,1	1272000	33536,994	6,77	76,08	17,15
1999	4371,1	1263000	34728,100	6,67	76,17	17,17
2000	4152,6	1258000	35328,954	6,03	76,67	17,31
2001	4476,2	1272000	39669,387	5,62	76,57	17,81
2002	5186,9	1289000	48446,864	5,42	76,50	18,08
2003	6665,7	1330000	62492,850	5,20	77,04	17,75
2004	7943,8	1355000	67024,733	4,97	77,29	17,74
2005	8674,4	1371000	71724,916	4,53	77,70	17,77

Source: authors according to SLJRH-2007., ILO-LABORSTA; [http://laborsta.ilo.org/cgi-bin/brokerv8.exe#\(29.2.2008.\)](http://laborsta.ilo.org/cgi-bin/brokerv8.exe#(29.2.2008.))

Although in HDI calculation education of the population is used as one of the variables, Table 4 shows information on the structure of employees with primary, secondary and tertiary education. It is considered that there is a firm correlation between variables listed in the table and the growth of gross domestic product, considering the fact that countries with more developed human resources also achieve faster development. (Barro, R. J.,1999).

What follows are regression equations for data in Table 4.

$$\text{GDP/pc} = -31,7113 + 5,629 \ln A \quad (1)$$

$$R = 0,88501913, R^2 = 0,78325887, F(1,7) = 25,297, p < 0,00151$$

$$\text{GDP/pc} = 5,5088 + 0,8124 \ln B \quad (2)$$

$$R = 0,94980782, R^2 = 0,90213489, F(1,7) = 64,527, p < 0,00009$$

$$\text{GDP/pc} = 14728,30 - 1565,24C \quad (3)$$

$$R = 0,81679786, R^2 = 0,66715874, F(1,7) = 14,031, p < 0,00721$$

$$\text{GDP/pc} = -189532 + 2546D \quad (4)$$

$$R = 0,89201860, R^2 = 0,79569719, F(1,7) = 27,263, p < 0,00122$$

$$\text{GDP/pc} = -3484,2 + 2309E \quad (5)$$

$$R = 0,51237302, R^2 = 0,26252611, F(1,7) = 2,4919, p < 0,15844$$

The regression equations indicate that there is a correlation between all dependent variables and gross domestic product per capita. Regression equations (1) and (2) are exponential equations which prove that the increase in number of employees and investments increase gross domestic product per capita. The significance and constants of these variables indicate that investments result in faster

increase in gross domestic product per capita than change of the number of employees.⁵ Furthermore, the analysis of the influence of the employee number on the growth of GDP per capita (1) indicated that 88% deviations of variables are explained by 0 straight-line equation, 95% in investments; (2) 81% in the employee structure with primary education (3), 88% in the employee structure with secondary education (4). Also, in regression equations (1-4), there is a small probability that the results were obtained at random ($p < 0,05$).⁶

The weakest correlation between the variables is established in the correlation between the gross domestic product growth and the change in the share of employees with tertiary education (50% of variable deviations is explained by the straight-line equation). The P-test indicates that the regression equation (5) should be dismissed for probability that the results are obtained at random and that a highly accurate conclusion on the change of GDP in the observed period could be made without the share of highly-educated employees. The rigidity indicated by the influence of the employee structure with tertiary education leads to the conclusion that, in the Republic of Croatia, many employees with college education still perform secondary education jobs. This also indicates slow changes in the economic structure in terms of increase in the share of modern industries and catering industry, the development of which is based on intellectual tasks.

Analysis of the trend coefficient of regression equations (1-5) proves that the increase in the number of employees, investments and improvement of educational structure in favour of the employees with secondary and tertiary education increases the level of gross domestic product.⁷ The only deviation is evident in the education of employees with primary education. Namely, by increasing the number of employees with primary education, there would be a decrease of gross domestic product, which is in accordance with the conclusion that increase in education structure of the employees has a positive influence on production increase measured by gross domestic product.

Analysis of the influence of increase of observed variables in one unit, it can be established that the most severe loss of the Republic of Croatia in terms of GDP increase results from unfavourable educational employee structure. Namely, in the most developed countries, the share of employees with tertiary education has exceeded 60%, and the number of employees with the lowest level of education amounts from 0,5% to 3%. At the same time, in Croatia, there are only 17% of highly educated employees in full employment.

CONCLUSION

The terms human resources and human capital are often identified, although they should be differentiated in terms of content. Human capital is the value invested in people (employees), primarily through education and health care, with the purpose of

⁵ The investment constant is positive (+5,5088), and negative when it comes to the change in the number of employees (-31,7113).

⁶ The P- test is used to prove independence of the variables; when p is $< 0,05$, the variable is accepted.

⁷ All coefficients with dependent variables have a positive sign, which means that by increasing the variable for one unit, gross domestic product grows.

creation of knowledge, skills and work abilities. Human resources imply overall psychophysical abilities managed by companies which can use them to achieve their business objectives.

The role of human resources in the development of companies and national economies has been on the rise. This results in more frequent attempts at their affirmation and measuring their influence on growth and development. The Human Development Index has been increasingly applied as an indicator of human development, and this paper provides analysis on the reason this index makes a good indicator of human resources development. The research has shown that human resources develop most rapidly in middle-developed countries, including the Republic of Croatia, but not fast enough to drastically reduce developmental differences in comparison with the highly developed countries. In order to reduce developmental differences measured by the achieved GDP per capita, it is necessary to achieve multiple reduction of differences in human resources development.

According to international classification, the analysis of human resources development in the Republic of Croatia and in Primorsko-goranska County indicated high human resources development indices. The index is higher in Primorsko-goranska County; however, in comparison with Croatian average in 2001 and 2005, the conclusion can be made that the advantages of the County have been on the decrease. However, County is not developmentally using advantages in development in human resources because its advantages in GDP per capita are diminishing faster than advantages in human resources education.

The analysis of the influence of investments, employment and education has indicated that education, i.e. tertiary education, has the least influence on the growth of GDP of Republic of Croatia.

The rigidity indicated by the influence of the employee structure with tertiary education leads to the conclusion that, in the Republic of Croatia, many employees with college education still perform secondary education jobs. This also indicates slow changes in the economic structure in terms of increase in the share of modern industries and catering industry, the development of which is based on intellectual tasks.

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