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Human Capital, Entrepreneurship and Rural Growth of the Serbian Economy

Људски капитал, предузетништво и рурални раст српске привреде

Abstract

In the new economy, based on knowledge and innovation, the concept of human capital is becoming an increasingly important factor of growth (and development) not only for urban, but also for rural areas. The studies dealing with the analysis of the available human capital at the local level have highlighted its significant presence in rural areas characterised by a “specific environmental quality”, defined in the literature as rural outdoor amenities. Highly educated individuals who live and work with their families in these areas are responsible for the successful transformation of the local economy, employment growth, the improvement of living standard, development of entrepreneurship, and achievement of high rates of economic growth. This paper is aimed at analysing the relevance of the concept of human capital for rural development, with special emphasis on the rural development of Serbia. The paper presents the results of an

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empirical study of the model of economic growth of rural areas in Serbia, based on the panel data analysis, during a five-year period. According to the results, human capital and entrepreneurship have a significant impact on economic growth. Additionally, there are significant differences in the rate of economic growth between the rural areas with high and low outdoor amenities in Serbia. Human capital and entrepreneurship are represented in the models of rural economy growth as determinants of the development mechanism through which rural economies grow.

Key words: rural areas, outdoor amenities, human capital, entrepreneurship, rural growth, Serbia.

JEL Classification: J24, L26, R12.

Introduction

Important factors which shape economic growth (and development) of rural areas in the 21st century are: *structure of industry*, *volume of human capital*, *volume of entrepreneurial capital*, *natural amenities* (climate and the beauty of natural landscape), *built facilities* (development of infrastructure that provides opportunities for different recreational activities), *rich cultural/historical heritage*, *development of transport infrastructure* and *geographical location* (distance, proximity to the market of inputs and outputs).

Research studies carried out at the end of 20th and the beginning of 21st century are credited for extending the hypothesis on the importance of the concept of human capital for rural development. Although the volume of human capital is smaller in rural areas than in urban, rural development also depends on new combinations of knowledge and ideas (Wojan & McGranahan, 2007; McGranahan, Wojan & Lambert, 2010; Josipović, 2018 a). In addition to the concept of human capital, the concept of entrepreneurial capital is relevant for rural development. At the local level, entrepreneurial capital has been recognized as one of the factors that can ensure linking of knowledge and competencies of individuals with economic growth through its commercialization by establishing new enterprises. The growth of entrepreneurial activities in rural areas provides the necessary capital for diversification of the local economy, primarily through the development of the secondary and tertiary sector. Also, entrepreneurship has proven to be a good option for expanding sources of income, increasing local employment and raising the living standard of rural residents.

This paper is aimed at analysing the relevance of the concept of human capital for rural development, with particular reference to the rural development of Ser-

bia. The presence of human capital and entrepreneurship in the growth models of the rural economy can be seen as determinants of the mechanism through which rural economies grow. Important prerequisites for defining an appropriate model of rural economic growth are *the existence of outdoor amenities and a significant volume of human capital, and the development of entrepreneurship and entrepreneurial spirit within the rural population.*

The basic research questions in this paper are:

- Does the relationship between human capital and the economic growth of a particular rural area depend on two local prerequisites: outdoor amenities of a given rural area and the level of entrepreneurial activity that characterises it?
- Can the relationship between the level of human capital and the economic growth of rural areas in Serbia be identified?
- Are there significant differences in the rate of economic growth between rural areas of high, medium and low outdoor amenities in Serbia?

The paper is divided into five parts. After the introduction, the second part gives an overview of the results of previous empirical research on the role of factors of outdoor amenities in attracting human capital and the relevance of the concept of human capital for rural development. In addition, in this part of the paper, methods for quantifying human capital for the needs of conducting empirical research are explained. The third part gives an overview of the results of previous empirical research on the significance of the concept of entrepreneurship for rural development and explains its role in endogenous growth models. The fourth part of the paper contains the results of the application of the model of the economic growth of rural areas in Serbia based on panel data analysis that includes outdoor amenities, human capital and entrepreneurship as factors that can have a significant impact on rural economic growth. The last part of the paper refers to concluding observations and recommendations for rural policy. A special importance is given to the instruments for improvement of rural environment and stimulation of investments necessary for improvement of the quality of available human capital and growth of entrepreneurial activities in rural areas in Serbia.

1 Human capital and rural outdoor amenities

According to traditional models, the direction of migration of the population is significantly shaped by economic factors such as employment opportunities, income levels, real estate prices, etc. Due to the technological development, increase in living standard and change in people's preferences, demand for specific rural outdoor amenities is rising.

In developed economies, outdoor amenities (natural, built and cultural) play an important role in shaping the migration movements of the population between the urban and rural areas. Different factors of rural outdoor amenities (pleasant climate, different topography, rich water and forest resources, possibilities for rest and recreation in nature, rich cultural/historical heritage, etc.) can be in the function of attracting and retaining the working age population, new entrepreneurs, tourists, as well as the retired population.

Rural areas characterised by outdoor amenities and significant human capital have a greater potential for economic growth than other rural areas. In the growth models of rural economy, outdoor amenities and human capital are the part of a mechanism that can provide the necessary transformation and growth of the rural economy (Josipović, 2018, p. 49). In order to provide a theoretical explanation and empirical confirmation of the impact of outdoor amenities on rural economic performance Deller, Tsai & Marcouiller (2001) presented a structural model of regional economic growth, which includes the impact of rural amenities. The basic assumption of the model is that an increase in national income increases the demand for outdoor amenities and other factors that improve the living conditions. The model was estimated on a sample of 2,243 rural areas in the US with the use of econometric comparative data models. According to the research results, economic growth is influenced by four groups of factors: *market, human capital, fiscal policy measures and outdoor amenities* (climate, land, available water resources, winter recreational activities and infrastructure development). The outdoor amenities affect rural economic growth in the following way (Deller et al., 2001, pp. 361-362):

- *The climate* has a strong impact on the growth of the rural population.
- Rural areas that are rich in *water resources* have higher rates of population growth and income per capita.
- The development of *regional infrastructure* and *the availability of winter recreational activities* have a significant, positive impact on the growth of population, employment and income per capita.

Wu & Gopinath (2008) analysed the impact of factors such as natural amenities, available human and physical capital, and geographical position, on spatial differences in terms of economic development. Their contribution is reflected in providing a theoretical explanation and empirical confirmation of the relationship between the natural amenities and the spatial differences in terms of the amount of average income per capita and the price of real estates. According to the developed theoretical model, the individual chooses the location for life and work to maximise the overall usefulness taking into account the trade-off between the amount of income that can be earned, the prices of real estates and the outdoor amenities of the given locations.

Rural amenities affect economic growth (employment growth and rural entrepreneurship development) indirectly through the impact on net-migrations, whose most significant part are highly educated individuals (Figure 1).

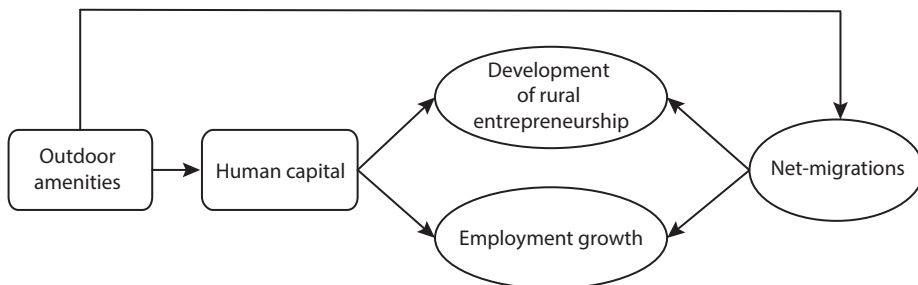


Figure 1. Link between the concept of outdoor amenities and the concept of human capital with rural development

Source: Author's presentation

The results of research on the role of human capital in rural growth (and development) have confirmed the hypothesis: *if rural areas are characterized by a high volume of human capital, then knowledge and skills of individuals are more important for the development of local economies* (McGranahan et al., 2010; Ulrich-Schad, 2015). In the US and the EU member states, a significant part of the migration flow of the population between the urban and rural areas is highly educated, creative and talented individuals who are willing to move from cities and start their own business in rural areas of high outdoor amenities. These areas are mostly inhabited by individuals between 25 and 50 who want to provide the best possible conditions for raising their families and the possibility for rest and recreation in nature. Also, these individuals are often new rural entrepreneurs. They are ready to launch the initiative and take the risk of a new business venture characterized by a high degree of uncertainty. Mostly the population between 15 and 34 leave these rural areas in order to gain education, build a career and provide financial security.

In order to test the hypothesis on the connection of human capital with economic growth, one can ask the following question: *How can the level of available human capital in a particular geographical area be best measured (quantified)?* According to the approach that has been long present in the literature, human capital can be viewed through the level of formal education of the population/employees. It starts from the assumption that education represents the most important investment in human capital.

Lucas (1988) pointed to the importance of clustering, the creation of a human capital cluster in a specific geographic area. The biggest economic growth

is characteristic for the cities whose greatest competitive advantage is reflected in the creation of the so-called “*human capital clusters*” that enable the transfer of knowledge and information and are becoming more and more important for the development of innovation and increase in productivity at the regional level. Knowledge relates to individuals, not to certain industries, and thanks to the process of clustering (grouping) of highly educated individuals and their skills, talent and entrepreneurial abilities, the so-called *externalities of human capital* that generate economic growth. The most developed cities are “*incubators*” of creativity and innovation where human capital plays an important role in fostering economic growth.

At the beginning of 21st century, the concept of human capital was defined as creative human capital (Florida, Mellander & Stolarick, 2008). According to this concept, the extent of human capital can be measured by the structure of employee profession. Human capital consists of individuals who perform the so-called *creative professions* such as: computers and mathematics, engineering, management, education, finance and business, art, design, entertainment, sports, media, etc. Today, both concepts of human capital are relevant and have a complementary role in economic growth (and development). Highly educated individuals and the creative class represent a good approximation for the extent of available human capital in a specific geographic area (Florida et al., 2008). Creative capital represents a better measure of human capital when considering its impact on economic growth as a determinant of regional productivity. Unlike creative capital, human capital observed through the level of achieved formal education of employees contributes to the increase in total wealth at the regional level.

2 Human capital and rural entrepreneurship

The role of entrepreneurship in the exploitation of knowledge has been recognized in the third generation of the endogenous growth model. A high level of accumulated capital of knowledge is needed, but it is not a sufficient condition for economic growth (Acs, Audretsch, Braunerhjelm & Carlsson, 2004). The achievement of a high rate of economic growth, at the national and regional level, depends equally on the resources provided for creating knowledge (investment in research and development) and the development of entrepreneurial skills and abilities. Economic growth requires researchers who create inventions and entrepreneurs who successfully commercialise them.

Empirical research carried out in the member countries of the Organization for Economic Co-operation and Development (OECD)³ confirmed the hypothesis that entrepreneurship is a link between the created knowledge on the one

³ See more in: Acs et. al., 2004.

hand and its commercialisation in new business ventures on the other. The developed model of economic growth with entrepreneurship was assessed using econometric methods and panel data analysis (a model of fixed effects) and it was concluded that entrepreneurship had a significant, positive impact on the growth of gross domestic product during the period 1981-2001. The highest rates of economic growth were characteristic for the member states that had high investments in research and development during the period and the high participation of entrepreneurs in the total number of employees. Also, research studies carried out in the US area (Michelacci, 2003) that analysed the impact of R & D activities (number of patents, % of the population engaged in research and development activities) and entrepreneurship (measured by the participation of the number of the self-employed in the total number of the employed) on economic growth (unemployment rate and gross domestic product) have confirmed the hypothesis that high investments in research and development will not contribute to economic growth due to the lack of entrepreneurial abilities of the working population.

The role of human capital in creating and developing entrepreneurial initiatives in rural areas is significant. Human capital has been recognized as one of the factors that stimulate the growth of entrepreneurial activities at the local level (Audretsch, Lehmann & Seitz, 2017). In developed economies, rural areas of exceptional outdoor amenities that have significant human capital have better economic performance thanks to innovations and dynamic entrepreneurship.

There is a gap in the literature regarding realised empirical research whose tasks are reflected in the role of entrepreneurship in rural economic growth (and development) and the analysis of factors that stimulate the development of entrepreneurship in rural areas. The results of the previous research (Acs et al., 2004; Audretsch, Bönte & Keilbach, 2008; McGranahan et al., 2010; Fritsch & Sorgner, 2013; Komarek & Loveridge, 2014; Josipović, 2018b) pointed to the following: *if rural areas are characterized by a high level of entrepreneurial activities, then entrepreneurship has a positive impact on rural economic growth*. Rural areas with great outdoor amenities⁴ that had a high volume of human capital and a high volume of entrepreneurial activities, had the greatest economic growth, the growth in employment rates and the number of SMEs and entrepreneurs in the 1990s in the United States. Thanks to these rural areas, the national economy has been transformed entirely by reducing the dependence on traditional sectors such as agriculture, forestry and mining and developing the processing industry and tertiary activities such as trade, services and rural tourism. The contribution of the

⁴ Identified on the basis of the widely accepted composite index of outdoor amenities (McGranahan et al., 2010) as a synthetic indicator of various factors of natural and built amenities of the rural environment.

outdoor amenities is reflected in ensuring the long-term sustainable interaction of human capital and entrepreneurship, ie enabling long-term growth of both human capital and entrepreneurial activities. Today, the growth of entrepreneurial activity in rural areas with great outdoor amenities is most often associated with the service sector: computer programming, data processing and other computer services, engineering services, broker and dealer services, legal services, banking and financial services, insurance services, accounting and auditing, bookkeeping services and others.

Regional variations in terms of the volume of entrepreneurial activities can be explained by various factors, such as: the volume of human capital, the structure of industry, the level of income, the unemployment rate, outdoor amenities as important indicators of living conditions, population density, etc. Empirical research (Gottlieb, 1994, p. 273) carried out using interviews as research techniques confirmed that factors determining living conditions have a significant impact when entrepreneurs decide on a potential location for running a business. Factors such as climate conditions, recreational and cultural facilities, good schools and environmental protection are ranked at the very top. Traditional factors for locating enterprises in rural areas (cheap labour, lower taxes, tax rates, etc.) are less important and are most often ranked below the outdoor amenities factor. Factors such as labour supply and proximity to the market are more important than outdoor amenities.

Since outdoor amenities are locally specific, non-market goods and services that are primarily benefit for the existing and new rural residents, the question may arise: *Do specific local outdoor amenities have the power to attract and retain new rural highly educated entrepreneurs?* In the literature that explains the connection between human capital and entrepreneurship, the so-called *entrepreneurial human capital* was introduced as the term that relates to knowledge and skills (competences) held by entrepreneurs (Skuras, Meccheri, Moreira, Rosell & Stathopoulou, 2005). Formal (education and training) and informal elements (work experience, business experience, environment, etc.) have a significant role in the accumulation of entrepreneurial human capital in a particular rural area.

The economic goals of the entrepreneur and the social goals of economic development are more strongly linked in the rural areas than in the urban (Harpa, 2017, p. 966). *The concept of rural entrepreneurship* is relevant for the rural areas with great outdoor amenities (Korsgaard, Müller & Tanvig, 2015). This specific form of entrepreneurship refers to all forms of entrepreneurship which are based on a firm connection between an entrepreneurial activity and a particular rural environment, that is, unique factors of a certain rural area. Factors of outdoor amenities (natural, recreational, historical and cultural) represent the necessary inputs for the development of rural entrepreneurship. Rural entrepreneurs create

a new economic value through a creative combination of different locally specific rural resources. He is the owner-manager who is ready to take risks, manages business opportunities, gets a reward for success, but also bears consequences in case of failure. As managers, they decide on their own when they will be innovative, what innovations they will adopt and how they will provide the capital needed to initiate change and provide competitive advantage. The most common motivators that influence the decision of an individual to become a rural entrepreneur have been identified: the ability to realize their own ideas, the possibility of additional income and return to the labour market (alternative to unemployment) (Păunescu, Staicu & Pop, 2018).

The basis of rural entrepreneurship is the combination of locally specific resources aimed at creating value added not only for entrepreneurs, but also for the rural economy. The specificity of rural entrepreneurship in relation to other forms of entrepreneurship is reflected in its close connection with a particular rural area. Its advantage is reflected in the contribution to the efficient use of available rural resources and the connection with a particular rural area over a longer period of time (Korsgaard et al., 2015).

Entrepreneurship, the founding and growth of new enterprises is an important dimension of innovation and a key indicator of smart rural development (Naldi, Nilsson, Westlund & Wixe, 2015, p. 96). New businesses are created as a result of creativity of entrepreneurs and create a new value for the local economy through new products, services and new forms of business and contribute to the improvement of local living conditions. In addition to numerous advantages for the development of rural entrepreneurship (locally specific advantages that make up the natural, recreational, cultural and social amenities, low-cost labor, availability and low price of land, focus on business in a particular market niche, etc.), rural areas are characterized by certain barriers which make it difficult to launch entrepreneurial initiatives. The most common barriers are: underdevelopment of local infrastructure and institutions, low volume of human capital and underdevelopment of business networks and financial markets.

In the new economy, rural development must be based on the creation of new knowledge, ideas and innovations and the development of entrepreneurship. In this process, a key role belongs to the highly educated individuals who inhabit rural areas to enjoy locally specific benefits provided by their high quality living conditions (rich natural landscape, leisure and recreation possibilities and rich cultural facilities). It is necessary to improve entrepreneurial capital in rural areas through local strategies for developing entrepreneurship and by formulating appropriate policies and instruments. Entrepreneurial capital represents the capacity of the region, the city or the state to encourage and support new entrepreneurial initiatives by providing assistance in problem solving, reducing

bureaucracy, organizing training aimed at providing support in planning and developing managerial skills within rural population by securing favorable sources of financing from banks and other financial institutions, etc. (Audretsch et al., 2008, pp. 687-688). In addition, entrepreneurial capital can be treated as an environment of agents, practices, traditions and institutions of economy, region or society which stimulates entrepreneurial behavior and the culture of risk taking.

3 The model of economic growth of rural areas in Serbia

After the theoretical explanation and the given literature review on the importance of the three concepts (outdoor amenities, human capital and entrepreneurship) for rural development, in this part of the paper a developed model of economic growth of rural areas in Serbia is presented. The model was developed to analyse the impact of human capital on the economic growth of Serbia's rural economy over a five-year period. Also, in this part of the paper we will present the results of the conducted empirical research obtained by the assessment of the proposed model of economic growth using appropriate statistical methods, econometric models and panel methods.

3.1 Description of the model and research hypotheses

Basically, the developed model of economic growth of rural areas in Serbia includes outdoor amenities, human capital and entrepreneurship as factors that can have a significant impact on economic growth. The model was developed in order to:

- analyse the impact of human capital on the growth of the rural economy in Serbia,
- research the correlation between the growth in the volume of human capital and the growth of entrepreneurial activities in the rural areas in Serbia and
- analyse the connection between outdoor amenities (natural and built) and the growth of the rural economy in Serbia.

There are two starting hypotheses in empirical research:

H1: *Human capital has a significant, positive impact on the economic growth of the rural areas in Serbia.*

H2: *There are significant differences in the rate of economic growth between the rural areas of high and low outdoor amenities in Serbia.*

Table 1 describes the variables from the developed model of economic growth of the rural areas in Serbia.

Table 1

Description of variables from the model of rural economic growth of Serbia

Variables	Description
Human capital	<i>Traditional measure</i> - participation of the number of employees with higher education in the total number of employees. Source: Department of Labor Force Survey, Statistical Office of the Republic of Serbia, 2009-2013.
Entrepreneurs	Participation of the number of entrepreneurs in the total number of enterprises (entrepreneurs, micro, small, medium and large enterprises). Source: “ <i>Report on Small and Medium Enterprises and Entrepreneurship</i> ”, Ministry of Economy, Planning and Regional Development, Republic Institute for Development and National Agency for Regional Development, 2009-2013.
Primary sector - employment	Participation in the number of employees in the primary sector (Agriculture, forestry and water management; Mining; Mining and Quarrying) in the total number of employees. Source: “ <i>Municipalities and Regions in the Republic of Serbia</i> ”, Statistical Office of the Republic of Serbia, 2009-2013.
Secondary sector - employment	Participation in the number of employees in the secondary sector (Manufacturing industry; Electricity, gas and steam supply; Water supply and waste water management; Civil Engineering) in the total number of employees. Source: “ <i>Municipalities and Regions in the Republic of Serbia</i> ”, Statistical Office of the Republic of Serbia, 2009-2013.
Tertiary sector - employment	Participation in the number of employees in the tertiary sector (Wholesale and retail trade and repair of motor vehicles; Transport and storage; Accommodation and food services; Information and communication; Financial activities and insurance activities; Real estate activities) in the total number of employees. Source: “ <i>Municipalities and Regions in the Republic of Serbia</i> ”, Statistical Office of the Republic of Serbia, 2009-2013.
Quaternary sector - employment	Participation in the number of employees in the quaternary sector (Professional, scientific, innovation and technical activities; Administrative and support service activities; State administration and compulsory social security; Education; Health and social protection; Art, entertainment and recreation; Other service activities) in the total number of employees. Source: “ <i>Municipalities and Regions in the Republic of Serbia</i> ”, Statistical Office of the Republic of Serbia 2009-2013.
Working age population	Participation in the number of inhabitants aged 15 to 65 in the total population. Source: “ <i>Municipalities and Regions in the Republic of Serbia</i> ”, Statistical Office of the Republic of Serbia, 2009-2013.
Young population	Participation in the number of inhabitants up to 14 in the total number of inhabitants. Source: “ <i>Municipalities and Regions in the Republic of Serbia</i> ”, Statistical Office of the Republic of Serbia, 2009-2013.
The rate of the rural economic growth (dependent variable)	Growth rate of the number of entrepreneurs in the total number of employees calculated as the participation of the number of entrepreneurs in the total number of employees in the current year in relation to the number of entrepreneurs in the total number of employees in the previous year. Source: “ <i>Report on Small and Medium Enterprises and Entrepreneurship</i> ”, Ministry of Economy, Planning and Regional Development, Republic Institute for Development and National Agency for Regional Development, 2009-2013 and “ <i>Municipalities and Regions in the Republic of Serbia</i> ”, Statistical Office of the Republic of Serbia, 2009-2013.

Source: Author's presentation

For the purpose of assessing the developed model of rural economic growth in Serbia, human capital has been quantified based on the approach that takes human capital as “*highly educated*” human capital. *Human capital* has been quantified through the analysis of the level of formal education of employees in the rural areas in Serbia, that is, as the participation of the number of employees with higher education in the total number of employees.

In empirical research, the measurement of the volume of entrepreneurial activities in a particular area most often depends on the available statistical data. Given that rural areas are not homogeneous in terms of the size of their territory, in empirical research in order to compare the range of entrepreneurial activities between different rural areas, the number of entrepreneurs is usually standardised in relation to the total number of enterprises (*ecological approach*) or in relation to the total number of employees (*labour markets approach*) (Josipović, Dondur & Pokrajac, 2018). Given the heterogeneity of the observed rural areas in Serbia, the volume of entrepreneurial activity in each observed rural area has been measured by the participation of the number of entrepreneurs in the total number of enterprises.

In addition to human capital and the number of entrepreneurs, other independent variables are included in the model, which, according to similar studies (McGranahan et al., 2010), can have a significant impact on economic growth during the observed five-year period: *employment by sector, working age population and young population*. Rural economic growth (dependent variable) has been quantified by *the growth rate of the number of entrepreneurs in the total number of employees*.

The influence of all independent variables from the model on the growth rate of the number of entrepreneurs in the total number of employees was analysed during the period 2009-2013 on a sample consisting of 24 rural areas in Serbia⁵. In order to analyse the relationship between outdoor amenities and economic growth, the rural areas are classified into three groups (areas of high, medium and low outdoor amenities) based on research that presented the classification of the rural areas in Serbia in terms of outdoor amenities (Josipović, 2018 b; Rikalović & Josipović, 2018).

3.2 Results of empirical research

Since the number of observation units (rural areas) included in the survey is small (24 rural areas) and there is no possibility of their increase, the econometric models and panel analyses were used to test the starting hypotheses. The initial specification of the panel analyses for evaluating the determinants of the rural economic growth in Serbia is a *pooled data analysis with dummy variables*. Also,

⁵ Due to lack of data the survey will not include the rural areas of Kosovo and Metohija.

the panel analysis with dummy variables was selected to include the heterogeneity between the rural areas in Serbia in terms of outdoor amenities that distinguish them. The model includes dummy variables for three groups of the rural areas: areas of high, medium and low outdoor amenities. In this way, the variation of the dependent variable (the growth rate of the number of entrepreneurs in the total number of employees) in the rural areas is directly included in the model. The selected pooled data analysis with dummy variables is a model with a constant, which makes the number of dummy variables smaller by one than the number of formed groups of the rural areas. The model includes two dummy variables, one related to the rural areas of high outdoor amenities and the other relating to rural areas of medium outdoor amenities.

The pooled data analysis of economic growth in Serbia with two dummy variables can be expressed in the following form:

$$SR_{it} = \beta_1 + \beta_{12}V_2 + \beta_{13}V_3 + \beta_2K_{it} + \beta_3P_{it} + \beta_4KP_{it} + \beta_5PR_{it} + \beta_6SE_{it} + \beta_7TER_{it} + \beta_8KVA_{it} + \beta_9RS_{it} + \beta_{10}MP_{it} + u_{it}$$

where:

SR_{it} – the growth rate of the number of entrepreneurs in the total number of employees,

V_2 – dummy variable, takes value 1 for the rural areas of high outdoor amenities, and value 0 for other rural areas,

V_3 – dummy variable, takes value 1 for the rural areas of the medium outdoor amenities, and the value 0 for other rural areas,

K_{it} – human capital,

P_{it} – entrepreneurs,

KP_{it} – interaction of human capital and entrepreneurship,

PR_{it} – employment (primary sector),

SE_{it} – employment (secondary sector),

TER_{it} – employment (tertiary sector)

KVA_{it} – employment (quaternary sector),

RS_{it} – participation of the working age population (15-65 years old) in the total population;

MP_{it} – participation of the young population (0-14 years old) in the total population;

u_{it} – random model error.

Table 2 shows the descriptive statistics of all variables from the model.

Table 2

Descriptive statistics of all variables from the pooled data analysis of the rural economic growth in Serbia with two dummy variables

Variable		Mean	Minimum	Maximum	Std. dev.
Rate of growth of the number of entrepreneurs in the total number of employees	total	3.10	-11.19	27.75	7.27
	between		-2.71	8.54	2.43
	within		-8.12	23.54	6.87
"Highly educated" human capital	total	17.05	7.76	30.01	4.64
	between		10.36	25.63	3.92
	within		10.91	23.69	2.50
Participation in the number of entrepreneurs in the total number of enterprises	total	77.62	56.99	84.62	5.30
	between		58.78	83.81	5.35
	within		74.45	79.53	0.70
Employment – primary sector	total	5.52	0.98	15.72	3.55
	between		1.33	14.49	3.55
	within		3.64	8.05	0.62
Employment – secondary sector	total	38.77	26.98	52.71	6.01
	between		29.11	50.20	5.97
	within		33.93	43.57	1.29
Employment – tertiary sector	total	20.44	10.38	32.27	4.76
	between		12.34	30.42	4.67
	within		16.53	24.14	1.27
Employment – quaternary sector	total	35.17	20.72	48.24	5.10
	between		27.39	46.13	4.72
	within		28.08	39.50	2.12
Working age population	total	67.20	63.08	69.91	1.64
	between		63.84	69.58	1.62
	within		65.72	68.26	0.41
Young population	total	14.52	11.49	20.65	1.68
	between		11.86	19.33	1.59
	within		11.83	16.71	0.62

Source: Author' presentation

Pooled data analysis with two dummy variables was evaluated by the generalised least squares method due to the identified presence of autocorrelation and heteroskedasticity. Table 3 shows the results of testing the starting assumptions of the panel data analysis with dummy variables.

Table 3

Test of the starting assumptions of the Model of rural economic growth in Serbia

Assumption / Test	Realised value of statistics (p – value)
Autocorrelation / Wooldridge Test	12.18 (0.0020)
Heteroskedasticity / Breusch Pagan/ Cook Weisberg Test	10.83 (0.0013)
Specification error / RESET test	0.88 (0.4547)

Source: Author's presentation

Table 4 shows the results of the evaluation of the starting and final pooled data analysis of economic growth of the rural areas in Serbia with two dummy variables by the generalised least squares method. The final (reduced) model is a starting model without a variable which according to the results does not have a significant influence on the growth rate of the number of entrepreneurs in the total number of employees, ie without the participation of the number of employees in the quaternary sector in the total number of employees.

Table 4

Results of the evaluation of the starting and final pooled data analysis of economic growth of the rural areas in Serbia

Independent variables	Model with all variables		Final model	
	Estimated reg. coefficient	p - value	Estimated reg. coefficient	p- value
Constant	-210.023	0.001	-164.016	0.027
Human capital	8.137	0.002	8.133	0.002
Entrepreneurship	2.303	0.000	2.312	0.000
Human capital* Entrepreneurship	-0.103	0.002	-0.102	0.002
Employment – primary sector	1.677	0.000	1.242	0.000
Employment – secondary sector	1.133	0.001	0.708	0.000
Employment – tertiary sector	1.660	0.000	1.255	0.000
Employment – quaternary sector	0.434	0.172	-	-
Working age population	-1.484	0.000	-1.546	0.000
Young population	2.040	0.000	2.038	0.000
Rural areas of high outdoor amenities	-4.575	0.002	-4.692	0.002
Rural areas of medium outdoor amenities	-1.891	0.228	-2.089	0.190
R ² (R ² corrected)	0.41 (0.35)		0.40 (0.35)	
F statistics	6.71 (0.00)		7.31 (0.00)	

Source: Author's presentation

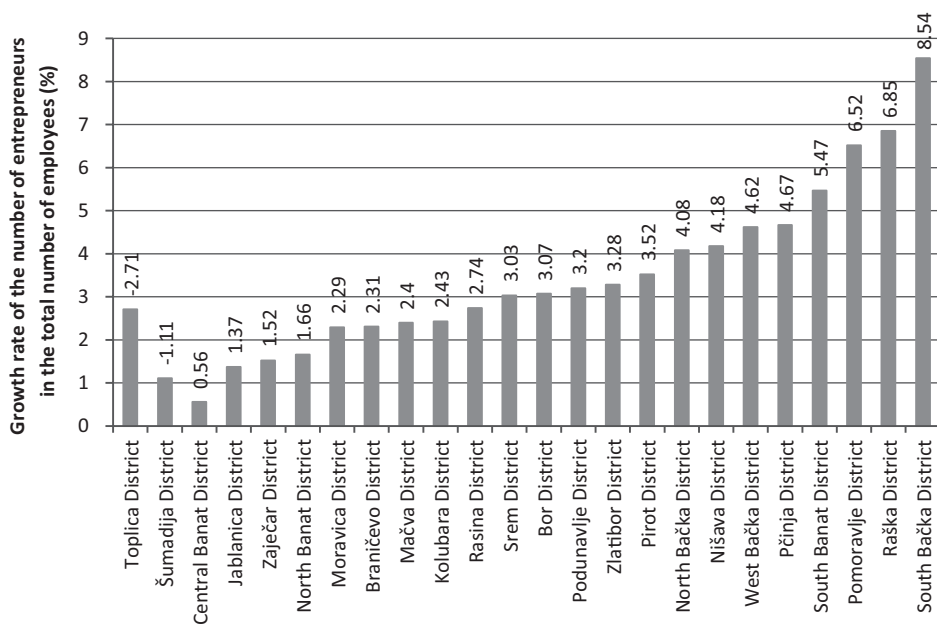
Based on the presented results of evaluating the developed model of economic growth of the rural areas in Serbia, we can conclude the following:

- The whole regression is statistically significant (at the level of significance of 1%).
- We can confirm the starting hypothesis H1, *human capital has a significant and positive impact on the growth rate of the number of entrepreneurs in the total number of employees.*
- Other explanatory variables in the model, apart from the participation of the number of employees in the quaternary sector, are statistically significant. The increase in the number of employees in the primary, secondary and tertiary sector as well as in young population has a significant and positive impact on the growth rate of the number of entrepreneurs in the total number of employees (the associated probability of F statistics is less than 0.05). The growth of the working age population does not contribute to the increase in the growth rate of the number of entrepreneurs in the total number of employees.
- All independent variables included in the model explain about 40% of variations of the dependent variable, the growth rate of the number of entrepreneurs in the total number of employees.
- We can confirm the starting hypothesis H2 that *there are significant differences in terms of the rate of economic growth between rural areas of high and low outdoor amenities in Serbia.* The included dummy variable in the model that refers to the rural areas of high outdoor amenities is significant with the negative sign of the estimated coefficient, meaning that the rural areas of high outdoor amenities (Zlatibor, Raška, Moravica, Pčinja and Bor Districts) have a lower growth rate of the number of entrepreneurs in the total number of employees in relation to the rural areas of low outdoor amenities (Srem, South Banat, Central Banat, North Bačka, Podunavlje, West Bačka and North Banat Districts).

3.3 Discussion

The empirical research results show that human capital and entrepreneurship have a significant positive impact on rural growth in Serbia. Unlike the results of similar surveys carried out in the rural areas in the United States and EU Member States (Wojan & McGranahan, 2007; Fritsch & Sorgner, 2013; McGranahan et al., 2010), rural areas of high outdoor amenities in Serbia did not use their comparative advantage (pleasant climate reflected in lower temperature fluctuations between summer and winter temperatures, different topography, rich water and forest resources, possibility for different recreational activities and developed transport infrastructure) as an instrument for the development of rural entrepreneurship.

Rural areas of high outdoor amenities in Serbia failed to attract a higher volume of human capital over the observed period compared to the rural areas of medium and low outdoor amenities. The volume of human capital above the average for all rural areas (16.90%) is a characteristic of only three rural areas of high outdoor amenities, Raška (19.20%), Bor (17.83%) and Moravica Districts (17.31%). Also, during the observed period 2009-2013 only three out of five rural areas of high outdoor amenities (Raška, Pčinja and Zlatibor Districts) had the average rate of economic growth above the average for all rural areas of 3.10% (Chart 1). During the observed period South Banat District which belongs to the group of rural areas of medium outdoor amenities had the highest average economic growth rate (8.54%).



Graph 1. The growth rate of the number of entrepreneurs in the total number of employees, the average for the period 2009-2013.

Source: Presentation of the author based on the data from the publication: “*Report on Small and Medium Enterprises and Entrepreneurship*” (2009, 2010, 2011, 2012, 2013) and publication: “*Municipalities and Regions in the Republic of Serbia*” (2008, 2009, 2011, 2012, 2013.)

The results of the evaluation of the rural economic growth model developed by McGranahan et al. (2010) pointed to the synergetic effect of human capital and entrepreneurship on economic growth of the rural areas in the US during the 1990s. Human capital is more strongly linked to the rural economy which

has a high volume of entrepreneurial activities. And vice versa, entrepreneurship will have a significant impact on economic growth if it has an advantage reflected in the knowledge, innovation and talent of human capital. Rural areas of high outdoor amenities which had a high volume of both human capital and entrepreneurial activities had the highest economic growth (growth of the employment rate and small and medium enterprises and entrepreneurs).

Based on the obtained results of the evaluation of the model of economic growth of rural areas in Serbia, it can not be concluded if human capital will be more strongly linked to the rural economy which has a high volume of entrepreneurial activities. The negative sign of the estimated coefficient with the variable interaction of human capital and the number of entrepreneurs in the total number of enterprises (Table 4) indicates the possible interdependence between the effects of human capital and the number of entrepreneurs on the rate of economic growth. The negative sign can indicate that at the higher levels of the volume of entrepreneurial activity, the relationship of human capital and the growth rate of the number of entrepreneurs in the total number of employees is weaker, i.e. it weakens as the values of the first predictor (the number of entrepreneurs in the total number of companies) grow. Table 5 gives calculation of the correlation coefficient between human capital and the rate of economic growth for the rural areas characterized by the lowest participation of the number of entrepreneurs in the total number of enterprises (six rural areas, 25% of the sample).

Table 5

Relationship between human capital and the rate of economic growth - rural areas with low participation of the number of entrepreneurs in the total number of enterprises

Rural areas with low participation of the number of entrepreneurs in the total number of enterprises	“Highly educated” human capital	The rate of economic growth	Correlation coefficient of human capital and the rate of economic growth
Moravica District	17.31	2.29	0.72
West Bačka District	20.58	4.62	
Nišava District	25.63	4.18	
North Banat District	17.54	1.66	
South Bačka District	24.91	8.54	
North Bačka District	17.56	4.08	

Source: Presentation of the author based on data calculated for the observed period 2009-2013

The correlation coefficient between human capital and the rate of economic growth for the rural areas characterized by the lowest participation of the number of entrepreneurs in the total number of enterprises is high, amounting to 0.72, which is confirmed by the negative sign of the estimated coefficient with the variable interaction of human capital and the number of entrepreneurs, indicat-

ing a more intensive relationship between human capital and economic growth in rural areas with the least participation of the number of entrepreneurs in the total number of enterprises.

Table 6 calculates the correlation coefficient between human capital and the rate of economic growth for rural areas with the highest participation of entrepreneurs in the total number of enterprises (six rural areas, 25% of the sample). Based on the data from the table, we can conclude that only one out of the six rural areas with the highest participation of the number of entrepreneurs in the total number of enterprises is the rural area of high outdoor amenities (Zlatibor District with participation of 15.11%).

Table 6

Relationship between human capital and the rate of economic growth - rural areas with high participation of the number of entrepreneurs in the total number of enterprises

Rural areas with high participation of the number of entrepreneurs in the total number of enterprises	“Highly educated” human capital	The rate of economic growth	Correlation coefficient of human capital and the rate of economic growth
Toplica District	16.90	-2.71	
Jablanica District	13.55	1.37	
Zlatibor District	15.11	3.28	
Zaječar District	18.80	1.52	-0.49
Šumadija District	20.54	-1.11	
Rasina District	15.43	2.74	

Source: Presentation of the author based on data calculated for the observed period 2009-2013

The correlation coefficient between human capital and the rate of economic growth for the rural areas with the highest participation of the number of entrepreneurs in the total number of enterprises is negative and amounts to -0.49. From the above, we can conclude once again that the relationship between human capital and economic growth is weaker in rural areas with the higher participation of the number of entrepreneurs in the total number of enterprise.

In the following period, appropriate local strategies will have to be adopted that will focus on sustainable management of outdoor amenities, improvement of human capital in the rural areas and development of entrepreneurship. The role of rural policy is to help regions create an entrepreneurial ecosystem defined by four key elements: the policies and program of development should generate entrepreneurship culture, education and training for entrepreneurship, business networks connecting entrepreneurs with suppliers and sources of capital, and ensuring access to capital, infrastructure and institution support (Rikalović & Molnar, 2014, pp. 46- 47).

Conclusion

Although the volume of human capital is lower in the rural areas than in the urban, in a knowledge-based economy for sustainable rural development it is necessary to ensure the development of new products and services through the development of innovations and the launching of entrepreneurial initiatives by highly educated individuals. Many research studies have pointed out to the relevance of the concept of human capital to rural development. The relationship between human capital and economic growth of a particular rural area depends on two local prerequisites: outdoor amenities of a given rural area and the level of entrepreneurial activity.

Due to the technological development, the increase in living standard and the change in people's preferences, demand for specific rural outdoor amenities is rising. In the US and EU member states, a significant proportion of the population's migration flows between urban and rural areas are highly educated individuals who are willing to move from cities and start their own businesses in rural areas of high outdoor amenities. Rural amenities affect economic growth indirectly through the impact on net migration, whose most important part are working age highly educated individuals. Rural areas that have outstanding outdoor amenities and significant human capital have a greater potential for economic growth than other rural areas. They have the opportunity to base their economic development on innovations and dynamic entrepreneurship.

The concept of rural entrepreneurship is relevant to the rural areas with rich outdoor amenities. This specific form of entrepreneurship refers to all forms of entrepreneurship based on a firm connection between entrepreneurial activity and a particular rural area, that is, unique factors that characterise a certain rural area. Rural entrepreneurs create a new economic value through a creative combination of different locally specific rural resources.

The role of human capital in creating and developing entrepreneurial initiatives in rural areas is significant. Human capital has been recognized as one of the factors that stimulates the growth of entrepreneurial activities at the local level. The literature that explains the relationship between human capital and entrepreneurship, has introduced the so-called term entrepreneurial human capital that relates to knowledge and skills held by entrepreneurs. Knowledge and skills of rural residents are more strongly linked to the local economy characterized by high entrepreneurial capital. Human and entrepreneurial capital must have a complementary role in rural development. The role of entrepreneurial capital is reflected in ensuring the connection of knowledge and competencies of individuals with economic growth through its commercialisation by establishing new enterprises. The growth of entrepreneurial activities facilitates the provision of necessary capital for diversifying local economy and contributes to the expansion

of sources of income generation, increase in local employment and increase in the living standard of rural residents.

The aim of this paper was to point to the importance of human capital for the rural development of Serbia. In order to analyse the influence of human capital on the growth of rural economy, investigate the relationship between human capital and entrepreneurial activities in the rural areas and analyse the relationship between outdoor amenities and the growth of rural economy, the paper presents the model of economic growth of the rural areas in Serbia. The developed model is based on outdoor amenities, human capital and entrepreneurship as factors that can have a significant impact on economic growth. In order to test the starting hypotheses, appropriate statistical methods and econometric models and panel analyses (pooled data analysis with two dummy variables) were used.

The starting hypotheses confirmed the results of the study. Human capital has a significant and positive impact on economic growth observed through the growth rate of the number of entrepreneurs in the total number of employees. The growth in the number of employees in the primary, secondary and tertiary sector, as well as the young population has a significant and positive impact on the economic growth rate. Also, there are significant differences in the rate of economic growth between the rural areas of high and low outdoor amenities in Serbia. Rural areas of high outdoor amenities (Zlatibor, Raška, Moravica, Pčinja and Bor Districts) have a lower growth rate, participation of the number of entrepreneurs in the total number of employees, compared to the rural areas of low outdoor amenities (Srem, South Banat, Central Banat, North Bačka, Podunavlje, West Bačka and North Banat Districts).

Despite the favorable environment for the development of rural entrepreneurship, rural areas in Serbia are characterized by certain barriers that hinder the growth of entrepreneurial activities. The most common barriers are: high dependence on the sector of agriculture, underdevelopment of local infrastructure and institutions, low volume of human capital as a result of unfavorable demographic structure of the population, insufficient use of information and communication technologies and smaller market. Rural entrepreneurs often lack the technical and managerial skills necessary to achieve set business goals. Also, the lack of examples of good practice (successful entrepreneurs as role models) and the underdevelopment of business networks slow down the development of entrepreneurship in rural areas.

Only by creating better economic conditions outdoor amenities can be used to initiate the migration flow of the population from urban areas to rural and to increase the available human capital in rural areas. The development of entrepreneurial culture in a particular rural area depends on the available human capital, the orientation of the working population to entrepreneurship, and the existence of local, financial and educational institutions that will support entrepreneurial

initiatives. Ensuring a stronger link between specific rural outdoor amenities and human and entrepreneurial capital is a necessary condition for achieving the goals of rural policy: the diversification of rural economy, job creation, productivity growth and competitiveness, the development of innovations and the improvement of living standard of the population.

Appropriate local strategies need to be developed to support rural entrepreneurs in the exploitation of local amenities, knowledge and skills of rural residents and locally specific resources. Local strategies for managing outdoor amenities and developing entrepreneurship, as well as formulating appropriate policies and instruments, can improve entrepreneurial capital in the rural areas in Serbia.

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Резиме

У новој економији, заснованој на знању и иновацијама, концепт људског капитала постаје све значајнији фактор раста (и развоја) не само урбаних, већ и руралних области. Истраживања која су се бавила анализом расположивог људског капитала на локалном нивоу указала су на његово значајно присуство у руралним областима које одликује „специфичан квалитет окружења” који је у литератури дефинисан као руралне погодности амбијента. Високообразовани појединци који са својим породицама живе и раде у овим областима заслужни су за успешну трансформацију локалне економије, раст запослености, побољшање животног стандарда, развој предузетништва, као и за остварење високих стопа економског раста. Предмет овога рада је анализа релевантности концепта људског капитала за рурални развој, са посебним освртом на рурални развој Србије. У раду су представљени резултати оцјене модела панела економског раста руралних области у Србији током петогодишњег периода. Резултати указују на значајан утицај људског капитала и предузетништва на економски раст, као и на постојање значајних разлика у погледу темпа економског раста између руралних области високих и ниских погодности амбијента у Србији. Људски капитал и предузетништво јављају се у моделима руралног економског раста као детерминанте механизма развоја кроз који руралне економије расту.

Кључне речи: руралне области, погодности амбијента, људски капитал, предузетништво, рурални раст, Србија.