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THE ECONOMIC AND ENVIRONMENTAL FACTORS' INFLUENCE ON HDI IN SOUTHEAST EUROPEAN COUNTRIES

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Abstract: *Human development can be defined as the process of enriching the basic freedoms, capabilities and opportunities of individuals with the aim of improving their general well-being. This concept includes the people's knowledge, abilities and skills enrichment, the expansion of their possibilities of choice, the encouragement of freedoms and the human rights enjoyment as wider determinants of the societal development. This article is devoted to the study of the impact of some economic and environmental factors on the Human Development Index (HDI) in nine selected countries of Southeast Europe in the period from 2006 to 2019. In addition to the presented HDI calculation methodology, the article also uses the Cross-sectional Seemingly Unrelated Regression (SUR) estimation technique, which indicated a positive and significant impact of the living standard, but at the same time a negative and significant impact of industrial development and the service sector on the HDI. On the*

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other hand, a negative and significant impact of renewable energy sources is also observable, which suggests that decision-makers should encourage appropriate measures, innovations and investments in renewable energy sources more intensively with the aim of boosting further human development and environmental protection.

Keywords: *Human Development Index (HDI) / standard of living / industrial development / service sector / renewable energy sources.*

INTRODUCTION

Human development is a concept that goes far beyond the traditional paradigm of economic development and the achieved standard of living, directing its attention to social welfare, quality of life and satisfaction of individuals as its central focal points. Human development is based on economic progress, quality education, adequate health protection policies and other social sciences, while its ultimate goal is the realization of social justice, both at the individual level and at the level of society itself. Therefore, Drewery (2011, p. 9) emphasizes that for individuals and contemporary countries, human development represents both a global and a moral project. While this concept was initially built on the economic and income dimensions, recently it has increasingly begun to take into account wider social determinants such as the development of people's knowledge, abilities and skills; the expansion of choices; the promotion of freedoms; and the enjoyment of basic human rights. The importance of human development is reflected in the shifting of the developmental economic goals from measures that boost national income and economic productivity to more people-focused policies (Ransure, 2019). Thus, human development got its broader meaning and interpretation, by capturing economic, political, social, cultural and environmental dimensions, while human resources began to be treated as a source of potential wealth of a country that is dedicated to achieving overall social prosperity. Human development is also aligned with the concept of sustainable development, which today has a central role in considering the progress and survival of contemporary humanity, placing special emphasis on knowledge and accumulated intellectual capital (Mitrović, 2020, p. 14). In addition to the ecological dimension, the concept of sustainable development also includes economic and social aspects aimed at achieving the well-being of the population and dignified socio-economic living conditions (Đurić, Tomaš Simin, Lukač Bulatović, Marković & Glavaš Trbić, 2023, p. 81).

The contemporary concept of human development is related to the Pakistani economist Mahbub ul Haq, who considered equalities, sustainability, productivity and empowerment as the four main pillars of the modern human development paradigm. Haq, in his epoch-making book from 1995, "Reflections on Human Development", points out that human development should be equated with improving the quality of life of citizens, as well as that the goals of economic development should be subordinated to the more general goals of social development. Haq (1995, pp. 13-23) thus expands the perception of development to the educational and health dimension of people, pointing out the importance of their knowledge, skills, experience, abilities, talents, mental and physical health, opportunities and freedom of choice for the development of the observed society. Making a string of well-thought-out arguments, Haq finally vividly describes that economic development does not provide guarantees for rich countries and individuals to help in improving health, education or other human development outcomes for poor ones (Quinn, 2017, p.3). In this way, Haq laid the foundations for the creation of the Human Development Index (HDI), which is widely used today as one of the most representative indicators of the achieved level of human growth in modern society.

The purpose of this article is to determine the impact of the most important economic factors, as well as ecological aspects on the trend of human development in selected countries of Southeast Europe in the period from 2006 to 2019. The following section deals with a brief literature overview devoted to this challenging topic, while the third one explains the essence and methodology of calculating the Human Development Index. The fourth section describes the data used and the applied research methodology, while the fifth section provides a discussion of the obtained results. The final section concludes the paper, providing concrete recommendations and guidance to policy makers.

LITERATURE REVIEW

Recently, a rich body of literature has been published that is dedicated to studying the impact of various economic, social, educational, institutional and political factors on HDI, as well as the reverse impact of HDI components on various dimensions of social development. Ahmad, Saranani and Rumbia (2019) apply structural equation modelling through the Partial Least Square (PLS) approach. They use a sample of 10 observed districts and 2 cities in Southeast Sulawesi in the period from 2010 to 2018, examining the impact of the main HDI pillars on the poverty level. The authors conclude that the HDI has a negative and significant effect on poverty, while of the three observed HDI main pillars, the education dimension plays a dominant role in enhancing human development and poverty eradication in the given sample units. Dinar, Hasan, Ahmad and Ma`ruf (2019) conduct a quantitative analysis of the impact of life expectancy, consumption per capita, the average duration of education and the literacy rate on economic growth in South Sulawesi Province in the period from 2008 to 2017. Using Multiple linear regression approach, the authors conclude that the three determinants of HDI in the form of life expectancy, per capita consumption and literacy rate have a positive and statistically significant impact on the economic growth in a given province. Fossaceca (2019) examines the national income efficiency of rentier states by applying regression analysis on a sample of 20 oil-exporting countries, whose economic development is mainly based on oil rents, in the period from 2012 to 2014. The author concludes that a significant part of HDI variations in oil exports dependent economies can be explained by the value added of various economic sectors such as services and agriculture, forestry and fishing. The author remarks that the effectiveness of government policy, services and the rate of urbanization have a positive impact on HDI, while the level of gender equality, agriculture and oil rents have a negative impact on this indicator as a proxy variable for the achieved developmental level.

Hamid (2019) examines the impact of the main HDI pillars on the Global Competitiveness Index (GCI) while considering 10 ASEAN countries in the period from 2010 to 2015. The author applies panel Granger causality test, panel data Regression model and Non-hierarchical clustering panel analysis with the aim of decoupling countries into two separate clusters and concludes that HDI and its components only partially affect the level of their global competitiveness. Gülcemal (2020) uses a panel Fixed Effects Model (FEM) and Random Effects Model (REM) to test the long-term impact of human and physical capital on gross domestic product. Based on a sample of 16 developing countries in the period from 1990 to 2018, the author concludes that human development expressed through the HDI encourages economic growth and development in developing countries. Priambodo (2020) uses an associative correlation analysis of the unemployment and poverty impact on HDI and economic growth on the example of Purbalingga Regency in the period from 2010 to 2019. The author also concludes that unemployment and poverty have a negative and statistically significant impact on economic growth and human development. Using the example of India for the period from 1990 to 2014, Prajapati (2020) confirms the existence of behavioural discrepancies between the old and new HDI indicator measured by the changed methodology from 2010. The author compares economic growth expressed by the gross national income per capita (GNI pc) growth rate and HDI and concludes that while GNI per capita achieves its exceptional growth, its impact on HDI is still low compared to the impact of life expectancy indicators. More precisely, while the Life Expectancy Index has the greatest impact, followed by the GNI pc, the Education Index shows the least impact on the HDI. The author also reveals the slow growth rate of human development in India.

Rohmah, Kuswanto and Wicaksana (2021) also examine the impact of health measured through the Life Expectancy Index, average and expected duration of education and per capita economic expenditure on HDI, by applying panel data Regression analysis on a sample of 9 districts and 2 cities in Jambi Province in the period from 2010 to 2020. The authors conclude that all considered components of human development have a positive and significant impact on HDI. Unlike them, Abdullah, Olilingo and Arham (2023) analyse the reverse impact of HDI and capital expenditure on economic growth. The authors apply a Double linear regression to a sample of observed regencies/cities in North Sulawesi in the period from 2012 to 2021. They came to the conclusion that human development has a positive and significant effect on economic growth, that the same holds for capital expenditures, as well as that both of these variables simultaneously significantly affect economic growth.

Purwaningsih, Inderanata and Fauziah (2023) use Spatial analysis to investigate the impact of regional development performance on the literacy rate, health dimension, education and economic component of HDI, on the example of the observed Indonesian provinces in the period from 2018 to 2020, confirming the existence of a relationship among all considered variables. Finally, Suryanto, Gravitiani, Diswandi and Arintoko (2023) use the Panel Vector Error Correction Model (PVECM) on a sample of 38 Asian countries in the period from 2012 to 2019. The authors introduce an ecological and psychological dimension into the consideration of human development by keeping track of two competing models and investigate the impact of human well-being and the Happiness Index (HI) on the level of energy consumption in both the short and long term. They concluded that there is a relationship between the level of energy consumption and human well-being, but also that the growth of energy consumption does not directly affect the quality of human life and well-being, but rather affects the growth of income through which it achieves its indirect impact on human welfare.

HUMAN DEVELOPMENT INDEX CALCULATION METHODOLOGY

During the last few decades, there has been a growing interest in developing a multidimensional indicator of well-being that would replace traditional, one-dimensional indicators of development such as gross national income (GNI), gross domestic product (GDP), GNI per capita, GDP per capita, public expenditures, public consumption, etc. This was the way of the Human Development Index creation in its attempt to integrate a number of relevant aspects of human development assessments. At the same time, human development can be defined as the process of obtaining resources that are necessary for a healthy and quality life of individuals and society itself (Akar, Saritas & Kizilkaya, 2021, p. 307). Today HDI is widely used, starting from the purpose of measuring achieved development and comparing developmental outcomes, all the way to making decisions about public policies and presenting the (un)desirable development outcomes of a certain country. As an alternative indicator to GDP and GNP, HDI undoubtedly represents a step forward, both in terms of encompassing the complex nature of social development and in terms of its refined theoretical basis.

The HDI was initially introduced during the 90s of the last century, in parallel with the beginning of the publication of Human Development Reports (HDRs) by the United Nations Development Program (UNDP). The HDI is a composite index that measures the average achieved progress in the health, education and economic dimensions of human development. More precisely, this indicator measures the achieved progress in terms of a decent standard of living through GNI per capita, in terms of access to knowledge and education by average and expected years of schooling, and in terms of long and healthy life by the average life expectancy of the population (UNDP, 2022, p. 27). The structure of the HDI calculation has been a subject to changes over time, so that today it has grown into a comprehensive tool for measuring the achieved progress in the mentioned dimensions and ranking countries accordingly. In addition, HDI is a comprehensive comparative measure that in a broader sense assesses the following six basic pillars of human development: equity, sustainability, productivity, empowerment, cooperation and security (Smith, 2016, p. 1). This indicator is calculated as the geometric mean of the normalized indices of its three basic dimensions, based on the following formula (UNDP, 2023):

$$HDI = \sqrt[3]{HDI_{Health} \times HDI_{Education} \times HDI_{Income}}$$

where HDI_{Health} is the Life Expectancy at Birth Sub-Index expressed in years, $HDI_{Education}$ is the Knowledge Sub-Index measured by expected and average years of schooling, while HDI_{Income} refers to the Sub-Index of Living Standard measured through GNI per capita. At the same time, when calculating these sub-indices, the minimum and maximum levels of the used indicators are determined in order to ensure the standardization of the component indicators, which are generally obtained based on the following formula (UNDP, 2023):

$$Component\ Sub - Index = \frac{actual\ value - minimum\ vaule}{maximum\ value - minimum\ value}$$

The HDI ranges from 0 to 1, where its higher values indicate a higher level of achieved human development and vice versa (Hoa, Liem &Phuoc, 2016, p. 4).

DATA AND APPLIED METHODOLOGY

The aim of this article is to investigate the impact of some economic, ecological and structural factors on human development in selected countries of Southeast Europe (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Montenegro, North Macedonia, Romania and Serbia) from 2006 until 2019. For this purpose, a sample of 9 countries with high and very high HDI levels for which it was possible to obtain and collect data was compiled. In its latest Human Development Report from 2022, UNDP defines Very high HDI countries as those whose values of this indicator range from 0.8 to 1, while the class of High HDI countries comprise of those countries whose HDI values range from 0.7 to 0.8 (UNDP, 2022, pp. 24-25). The data on HDI were derived from the UNDP database, while the other data used in the analysis came from the World Bank`s World Development Indicators (WDI) database, which ensured their complete comparability. The independent variables were first transformed by the natural logarithm with the aim of their normalization and stabilization. In the first step of the analysis, we employed a One-way Random Effects Panel Data Model on a sample of $N = 9$ observed countries and $T = 14$ periods, which makes a total of 126 balanced observations. After this step, the more suitable Cross-sectional Seemingly Unobserved Regression (SUR) estimation technique was applied with the aim of taking into account heteroscedasticity and simultaneous cross-sectional correlation of residuals.

The article examines the impact of a certain number of economic, sectorial and environmental variables on the level of HDI in selected countries of Southeast Europe for the period from 2006 to 2019, which are described in more detail in Table 1.

First, the Random Effects Model (REM) was used in the analysis, which assumes that the intercept values of each observed country are randomly drawn, that is the intercepts represent random variables. Random Effects Models also assume that the intercept and slope are constant, while treating differences of individual-specific effects in the error variance (Fitrianto & Musakkal, 2016, p. 245). At the beginning of methodological research, the article used the One-way Random Effects Model, which can be written by the following equation (Gujarati, 2012, p. 298):

Table 1. *Description of variables used in the research*

Variables	Variables code	Variables description	Variables type	Data source
Human Development Index (HDI)	HDI	HDI level calculated by UNDP staff	Dependent	UNDP
GNI per capita	GNI pc	GNI per capita in constant 2015 US$	Independent	WDI
Industry	IND	Industrial value added as a % of GDP	Independent	WDI
Services	SER	Services value added as a % of GDP	Independent	WDI
CO_2 emissions	CO_2	CO_2 emissions in metric tonnes per capita	Control	WDI
Renewables	RENEW	Renewable energy consumption as a % of total final energy consumption	Control	WDI

Source: Authors

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \cdots + \varepsilon_i + u_{it}$$

for $i = 1, \dots, N$ and $t = 1, \dots, T$ and where α is the intercept, X_{it} are independent variables that vary in time, ε_i is an individually specific error term component (cross-section random), while u_{it} is an idiosyncratic random (zero mean random disturbance with variance σ_u^2). After that step, the article approached to the Cross-sectional Seemingly Unrelated Regression technique in order to eliminate the effects of the observed heteroskedasticity and cross-sectional residuals` correlation.

RESULTS AND DISCUSSION

In the first step of the research, a correlation analysis was performed between all considered variables with the aim of determining the possible multicollinearity problem (Table 2). Since none of the Pearson`s bivariate correlation coefficients exceeded their threshold value of 0.9 (Tabachnick & Fidell, 2013, p. 89), it was concluded that the risk of multicollinearity was reduced, which allowed us to proceed with this analysis.

Table 2. *Matrix of Pearson`s correlation coefficients*

Correlation (Probability)	HDI	Ln(GNI pc)	Ln(IND)	Ln(SER)	Ln(CO_2)	Ln(RENEW)
HDI	1					
Ln(GNI pc)	0.4756* (0.0000)	1				
Ln(IND)	-0.3316* (0.0001)	-0.3706* (0.0000)	1			
Ln(SER)	0.3912* (0.0000)	0.7526* (0.0000)	-0.7201* (0.0000)	1		
Ln(CO_2)	0.2398 (0.0068)	0.4616* (0.0000)	-0.0949 (0.2903)	0.5748* (0.0000)	1	
Ln(RENEW)	-0.1769* (0.0476)	-0.2792* (0.0015)	-0.1346 (0.1330)	-0.3114* (0.0004)	-0.7070* (0.0000)	1

Note: * denotes statistical significance at the level of 0.05

Source: Authors` calculations

Detected cross-sectional dependence effects were also pronounced in the sample of nine observed Southeast European countries, which was confirmed by the results of the Pesaran (2004) Cross-sectional Dependence (CD) test that are presented in the following Table 3. This further means that there was a certain level of dependence among the observed countries of Southeast Europe in terms of their economic, environmental, energy and other policies, which confirmed the appropriateness of applying the second generation of panel unit root tests.

Table 3. *Results of the conducted Pesaran CD test*

Variables	Pesaran CD test statistic	Prob.
HDI	17.1240*	0.0000
Ln(GNI pc)	12.6167*	0.0000
Ln(IND)	3.4616*	0.0005
Ln(SER)	7.1562*	0.0000
Ln(CO_2)	3.1044*	0.0019
Ln(RENEW)	3.1318*	0.0000

Note: * denotes statistical significance at the level of 0.05

Source: Authors` calculations

After this step, we proceeded to conduct a unit root test on all considered variables at their levels with the aim of determining their stationarity (Table 4). For this purpose, we applied a panel Covariate Augmented Dickey-Fuller (CADF) unit root test corrected for the effects of observed cross-sectional correlations, with the aim of determining the state of unit roots in the observed variables. The CADF test was also used in the article since it was shown that it brings power gains, that it is applicable to small size macroeconomic panels and that it is based on the correct conditional model, without large distortions (Constantini & Lupi, 2011). The following Table 4 indicates the results of the applied CADF test.

Table 4. *CADF panel data unit root test results*

Variables	CADF test statistic	Status of time series
HDI	-2.8462* (0.0022)	Stationary
Ln(GNI pc)	-2.7771* (0.0027)	Stationary
Ln(IND)	-3.4698* (0.0003)	Stationary
Ln(SER)	-4.2758** (9.523e-06)	Stationary
Ln(CO_2)	-1.4541*** (0.0730)	Stationary
Ln(RENEW)	-3.4749* (0.0003)	Stationary

Note: * denotes statistical significance at the level of 0.01, ** denotes statistical significance at the level of 0.05, while *** denotes statistical significance at the level of 0.1

Source: Authors` calculations

After we established stationarity of all observed time series, in the next step of the analysis, the Breusch-Pagan Lagrange Multiplier (LM) test was applied with the aim of determining the significance of random effects in the observed structure of panel data. The results of the conducted Breusch-Pagan LM test indicated the presence of statistically significant cross-sectional random effects (BP Cross-section = 485.5537, p = 0.0000 < 0.05). In the next step of the research, the Hausman test was applied with the aim of choosing the preferred model in the ultimate choice between the FEM and REM options. The results of the conducted Hausman test also indicated that the Random Effects Model appeared as the preferred solution (Hausman Test Chi-Sq. statistic = 6.4837, p = 0.2620 > 0.05).

However, due to the observed cross-sectional dependence in the considered time series, but also the assumption that the observed Southeast European countries owing to their geographical proximity influence each other in terms of experience, common problems, adopted practices and the policies they lead, and following the approach of Adrangi and Kerr (2022, pp. 6-7), we applied several competing panel estimation methods. These estimation techniques corresponded to balanced panel data and included the next considered methods: a) Pooled OLS (POLS) panel data estimation, b) One-way Fixed Cross-sectional Effects Model estimation, c) estimation of One-way Random Cross-sectional Effects Model, and d) the assessment of Cross-sectional Seemingly Unrelated Regression (SUR) technique. Cross-sectional SUR technique is otherwise suitable for long (large T) and narrow (small N) stacked panel data which was also the case with the panel data used in this article. In doing so, we applied the Cross-sectional SUR Feasible Generalized Least Squares (FGLS) estimators, also called Parks estimators, which allow and correct for heteroscedasticity and contemporaneous correlation of cross-sectional residuals (Zellner, 1962). The results of all applied competing panel data estimation models are presented in the following Table 5.

Table 5. *Results of competing panel data models*

Models	Pooled OLS	One-way Fixed Cross-sectional Effects	One-way Random Cross-sectional Effects	Cross-sectional SUR
Intercept (C)	1.5458* (0.1565)	-0.0600 (0.1853)	-0.0359 (0.1848)	1.4359* (0.0391)
Ln(GNI pc)	0.0565* (0.0049)	0.1410* (0.0109)	0.1364* (0.0107)	0.0551* (0.0021)
Ln(Industry)	-0.1059* (0.0125)	-0.0425** (0.0196)	-0.0414** (0.0194)	-0.0978* (0.0031)
Ln(Services)	-0.2214* (0.0368)	-0.0970** (0.0390)	-0.0947** (0.0388)	-0.1997* (0.0081)
Ln(CO_2)	0.0115*** (0.0060)	0.0073 (0.0103)	0.0081 (0.0102)	0.0114* (0.0007)
Ln(Renewables)	-0.0202* (0.0052)	0.0346* (0.0060)	0.0354* (0.0059)	-0.0168* (0.0015)
R-squared	0.2980	0.9632	0.7492	0.9412
Adjusted R-squared	0.2934	0.9590	0.7388	0.9388
S.E. of regression	0.0410	0.0099	0.0099	0.9967
F-statistic	63.6865*	225.6749*	71.7036*	384.41*
Prob. (F-statistic)	0.0000	0.0000	0.0000	0.0000

Note:* denotes statistical significance at the level of 0.01, ** denotes statistical significance at the level of 0.05, *** denotes statistical significance at the level of 0.10 and standard errors in parenthesis

Source: Authors` calculations

The results of the chosen Cross-sectional SUR estimation technique indicated that it explained 93.88% of the variations in the dependent variable HDI. In addition, the statistically significant value of the F-statistic at the level of $\alpha = 0.01$ indicated that all predictors jointly contributed significantly to the HDI trend, also suggesting that it was a valid and well-fitted model. Besides, the considered model had a normal distribution of residuals (Jarque-Bera = 3.5216, p = 0.1719 > 0.05), while there was no heteroscedasticity in the proposed model (Breusch-Pagan LM test statistic = 15.6897, p = 0.9987 > 0.05), also indicating that it was a well-founded solution.

The obtained results of the estimated panel model first indicated that the standard of living measured by GNI per capita had the greatest positive and significant impact on the HDI of the observed Southeast European countries. With the growth of this indicator by one unit, there is also an increase in the HDI level of the observed countries by 0.0551 percentage points. However, at the same time, a negative correlation was observed among industrial and service value added, on the one hand, and the HDI scores on the other hand. In other words, the growth of industrial production and the service sector does not lead to the growth of HDI in the observed countries, indicating that most likely some other economic, but also wider social, educational, health, environmental and other factors determine the growth of HDI. The negative impact of these variables on HDI was also confirmed in all other considered models. This stems from the fact that in the observed sample countries, a distinct trend of deindustrialization and the decline of the service sector can be observed, which could also have contributed to these findings. In addition, it is also well-known that the growth of industrial production and services expansion leads to the growth of pollution, harmful greenhouse gas (GHG) emissions and endangerment of the environment, which in turn has a negative impact on people's health and quality of life, and therefore on the overall HDI scores. While the growth of CO_2 emissions also had a positive and statistically significant impact on HDI, it is surprising that the use of renewable energy sources showed a negative and statistically significant relationship with HDI. This further means that the observed countries did not sufficiently and seriously enough take into account this important source of economic growth, suggesting the need to encourage the reliance of future economic growth on greener technologies, as well as on renewables. With the increase in the share of renewable energy sources in the total final energy consumption by 1%, the HDI decreases by 0.0168 percentage points. This relationship can also be explained by the fact that it is about countries where the use of alternative and renewable energy sources is still in its infancy.

CONCLUSION

This article examines the impact of industrial production and the service sector, as well as some environmental factors on the trend of HDI in selected countries of Southeast Europe in the period from 2006 to 2019. The research analysed the case of Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Montenegro, North Macedonia, Romania and Serbia as countries for which it was possible to obtain data in the given time frame. For this purpose, a balanced panel of $N = 9$ cross sections and $T = 14$ time periods were created, which made 126 balanced observations. The article used the Cross-sectional SUR model that takes into account and corrects the assumed heteroscedasticity and the detected contemporaneous correlation of cross-sectional residuals.

The research findings indicated that the standard of living has the largest and statistically significantly positive influence on the HDI trend of the given countries, followed by a statistically significant influence of CO_2 emissions. On the other hand, the results of all four applied mutually competitive models indicated a negative and statistically significant impact of both industrial value added and services value added on HDI. This further means that, beyond all expectations, the growth of these variables affects the decline of the HDI, suggesting that increasing industrial development and the growth of services also lead to the growth of pollution and environmental devastation, which in turn have disastrous consequences for people's health, comfort and quality of life, and therefore for the overall HDI values. Finally, the use of renewable energy sources also gave quite unexpected, negative and significant results, pointing to the need for taking further steps towards the more intensive use of greener technologies with the aim of contributing better to human development in the observed countries. The objective limitations of this analysis stem from the fact that it considers a relatively small number of countries, while their additional inclusion in the sample could change to some extent its obtained findings. Future research directions could be aimed at covering the countries of Central Europe in a slightly wider time frame in order to get a broader picture of these factors' influence on human development in the European area. Yet, this article is especially instructive for decision-makers and policy makers, who would have to encourage innovation and investment in renewables, as well as to focus more intensively and seriously on solving local and global climate change issues. These findings could also help them in implementing appropriate fiscal and energy policy measures that would influence the further development of renewable energy, as well as encourage further research efforts in the direction of efficient use of natural resources with the aim of boosting human development and preserving the planet Earth.

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UTICAJ EKONOMSKIH I EKOLOŠKIH FAKTORA NA HDI U ZEMLJAMA JUGOISTOČNE EVROPE

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Sažetak: *Humani razvoj se može definisati kao proces obogaćivanja osnovnih sloboda, sposobnosti i mogućnosti pojedinaca sa ciljem unapređivanja njihovog opšteg blagostanja. Ovaj koncept uključuje znanja, sposobnosti i veštine ljudi, ekspanziju mogućnosti izbora, podsticanje sloboda i ostvarivanja ljudskih prava u vidu širih determinanti razvoja društva. Ovaj članak je posvećen izučavanju uticaja nekih ekonomskih i ekoloških faktora na Indeks humanog razvoja (HDI) u devet odabranih zemalja jugoistočne Evrope u periodu od 2006. do 2019. godine. Pored predstavljene metodologije izračunavanja HDI, u članku je bio primenjen i model Naizgled nepovezanih regresija (SUR) koji je ukazao na pozitivan i značajan uticaj životnog standarda, ali istovremeno i na negativan i značajan uticaj industrijskog razvoja i sektora usluga na HDI. Sa druge strane se uočava i negativan i značajan uticaj obnovljivih izvora energije, koji ukazuje na to da bi donosioci odluka trebalo intenzivnije da podstiču odgovarajuće mere, inovacije i ulaganja u obnovljive izvore energije sa ciljem pospešivanja daljeg humanog razvoja i očuvanja životne sredine.*

Ključne reči: *Indeks humanog razvoja (HDI) / životni standard / industrijski razvoj / sektor usluga / obnovljivi izvori energije.*