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FACTORS OF BUDGETARY FUNDING FOR HIGHER EDUCATION IN THE EUROPEAN COUNTRIES IN THE CONTEXT OF SUSTAINABLE AND HUMAN DEVELOPMENT: EXPERIENCE FOR UKRAINE

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ABSTRACT

The experience of the EU countries in the formation of the general government expenditures on tertiary education in order to adapt it to the social and economic conditions of Ukraine has been investigated. The purpose of the article is to find out the peculiarities and basic regularities of governmental funding for tertiary education in the EU countries in view of sustainable and human development and to define prospects for improving budgetary support for this sector in the economy of Ukraine. Such scientific methods as induction, deduction, comparison and econometric modelling have been applied. The author has worked out the scientific and methodological approach to identifying factors influencing the governmental financing of tertiary education in the EU countries for sustainable and human development: to carry out a comparative analysis of the dynamics of key indicators of the general government expenditures on tertiary education and evaluate their variation; to determine the main factors which influence the general government expenditures on tertiary education by means of multiple econometric modelling. The following public financing features of higher education in the EU countries are specified: the tendency to increase the volume of the general government expenditures on tertiary education per capita; changing in their structure; their sustainability by GDP. The analysis of the variation indicators has showed the existence of a significant level of differentiation in the general government expenditures on tertiary education per capita in these countries and relative homogeneity for other indicators (general government expenditures on tertiary education (% of GDP and % of the general government expenditures), their growth rates (% of the previous year). Based on the multiple econometric models, it is determined that GDP at market prices, the total annual net earnings of a single person without children, the situation in the labour market for people with tertiary education, the number of students enrolled in tertiary education (on bachelor's or equivalent level and at public education institutions) influenced the budgetary funding of higher education in the EU countries. Taking into account the experience of the EU countries, the author has substantiated that in Ukraine, upgrading the government funding of tertiary education for the sustainable and human development is associated with macroeconomic stability, improving the material well-being of individuals and a decrease in unemployment.

Keywords: educational public goods, vocational skills, higher education, funding, general government expenditure, sustainable and human development, econometric modelling

JEL Classification: C10, H52, I22, O15

INTRODUCTION

The acquisition of vocational skills through a tertiary education system promotes the improvement of qualitative parameters of human potential, increase productivity, socialization of economic relations and the formation of eco-oriented behaviour. In view of these positive externalities, educational public goods occupy one of the most important places in the system of sustainable and human development of the national

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economy, predetermining the necessity of formation of an effective model for financing higher educational institutions (HEI). The need for the specification of the tertiary education public financing factors in the EU countries is updated to outline the efficiency of budgetary support of the services of this sector in the Ukrainian economy.

LITERATURE REVIEW

Formation of scientific and methodological approaches to structuring the main regularities of public financing of educational public goods and tertiary education systems in the national economy and the economy of the EU in the context of sustainable and human development is debatable. The directions and conditions for reforming the HEI of Ukraine are determined on the position of ensuring their competitiveness in the European educational space by A. Pidgornyand T. Korol'ova [1]. Scientific approaches to improving the public financing of the HEI in Ukraine as subjects of a market economy are developed by Yu. Vitrenko [2]. In order to refine the control over the effective use of budget funds, it is proposed by I. Parasiy-Vergunenکو to evaluate budget expenditures of HEI based on the use of methodology of factor analysis [3]. The main trends in the dynamics and structure of education financing in the leading countries of the West in the conditions of the digital economy are analysed by I. Ershova, O. Belyaeva and G. Obukhova [4]. M. Kichurchak has evaluated peculiarities of social capital formation from the position of infrastructure development of educational public goods and formed scientific and methodological approaches to the specification of spatial characteristics of their provision in the Ukrainian economy [5; 6]. A. Vorontsova, T. Vasylieva and T. Mayborodahave substantiated the effectiveness of financial support in the countries of Central and Eastern Europe in the context of development and transformation of the structure of the national economy [7].

By the means of the methodology of nonparametric modelling T. Agasisti has analysed the effectiveness of public expenditures for tertiary education in the EU countries [8]. Based on a comparison of policies in the higher education sector in the EU countries S. Hoareau, J. Ritzen and G. Marconi found out that the expansion of university autonomy and increase in public funding affects positively the innovative potential [9]. Comparative analysis of higher education system financing models in the leading countries of the world and factors that affect this process was carried out by A. Goksu and G. G. Goksu [10]. By using economic and mathematical analysis Ya. Dissou, S. Didic, and T. Yakautsava substantiated the influence of government expenditures on education for accumulation of human capital and economic growth [11]. T. Haussen and S. Uebelmesser have identified the influence of foreign students' migration for government decisions making relating to private financing of tertiary education in OECD countries [12]. Features of global trends influence on the transformation of higher education financing in the UK are determined by S. Marginson [13].

Scientific approaches to improving the system of financing tertiary education in a market economy through the introduction by the government of the lending model, which depends on income, are formed by N. V. Long [14]. Taking into account the methodology of econometric modelling, R. Lozano and M. Barreiro-Gens specified social and economic factors that influence the incorporation of the concept of sustainable development in the system of tertiary education of the EU countries to obtain vocational skills [15]. A. Pleśniarska has conducted a comparative analysis and revealed positive trends in achieving a goal of sustainable development as far as the improvement of the quality of educational services provided by HEI in the EU countries is concerned [16]. Based on the methodology of regression analysis, M. Krstić, J. A. Filipe and J. Chavaglia substantiated interconnections between financial, scientific and knowledge indicators of HEI functioning in the EU countries and the competitiveness of the economy and sustainable development [17]. At the same time, there is a need for the specification of factors that influence the volume of general government expenditures on tertiary education (GGETE) in the EU countries through the implementation of the strategy of sustainable and human development to adapt this experience into Ukrainian budgeting practices.

AIMS AND OBJECTIVES

The purpose of the article is to find out the peculiarities and basic regularities of governmental funding for tertiary education in the EU countries in view of sustainable and human development and to define prospects for improving budgetary support for this sector in the economy of Ukraine. In order to achieve this goal, it is necessary to come out of such basic assumptions and means of their proof: the differentiation of the GGETE in the EU countries, which involves comparative analysis of their dynamics and evaluation of variation indicators; the existence of a system of interconnections between the volumes and structure of the GGETE in the EU countries and a set of economic and socio-demographic development indicators, and the basis is the methodology of multiple regression modelling.

METHODOLOGY AND RESEARCH METHODS

The following scientific methods are used: analysis and synthesis, induction and deduction, comparative analysis and econometric modelling. The scope and coefficients of variation, the sample variance for the set of indicators of the general government expenditures on tertiary education in the EU countries are calculated. Determining the main factors for multiple regression equations influencing the funding and structure of the GGETE in the EU countries is based on the methodology of step-by-step regression.

RESULTS

In 2013–2019, the general trend in the EU countries is an increase in volume of the GGETE per capita by an average of 10.9 % (Table 1). This indicates that at the national level they try to ensure equal access to higher education for the implementation of the objectives of sustainable development «Quality Education» [19]. However, an increase in the GGETE per capita in some EU countries had a wave-like character, in 2015–2017 mainly recorded their reduction. Such countries as Sweden, Slovakia, Lithuania and Italy by 2019 reduced them constantly. These differences are caused by the current macroeconomic situation in the analysed countries, demographic processes and public finance condition. In view of the sustainable and human development, the state support of the higher education system adapts to the existing socio-economic conditions and the possibilities of the general budget to ensure the goal of «Quality Education». For Ukraine, this means that the GGETE per capita should gradually increase, taking into account the peculiarities of the macroeconomic and security situation in the country, measures to implement a strategy of sustainable and human development.

Table 1. Main trends in the general government expenditures on tertiary education (levels 5–8) in the EU countries in 2013–2019

Country	2013				2015					2018					2019				
	GGETE*, euro per capita	GGETE % of the GGE on education	GGETE, % of the GGE	GGETE, % of GDP	GGETE, euro per capita	GGETE % of the GGE on education	GGETE, % of the GGE	GGETE, % of GDP	Growth rate of the GGETE, % of the p. y.	GGETE, euro per capita	GGETE % of the GGE on education	GGETE, % of the GGE	GGETE, % of GDP	Growth rate of the GGETE, % of the p. y.	GGETE, euro per capita	GGETE % of the GGE on education	GGETE, % of the GGE	GGETE, % of GDP	Growth rate of the GGETE, % of the p. y.
EU **	213.76	16.8	1.7	0.8	223.73	17.0	1.7	0.8	104.1	230.43	16.3	1.6	0.8	104.2	237.18	16.2	1.6	0.8	103.0
Belgium	339.87	15.1	1.7	1.0	336.76	14.4	1.7	0.9	102.5	349.33	14.0	1.7	0.9	103.5	361.17	14.2	1.7	0.9	104.0
Bulgaria	45.93	21.5	2.1	0.8	52.38	21.0	2.0	0.8	98.0	50.08	17.8	1.7	0.6	100.8	62.56	18.4	2.0	0.7	124.0
Czechia	130.41	19.0	2.0	0.9	127.18	18.0	1.9	0.8	99.8	158.24	17.5	2.0	0.8	135.5	160.49	15.6	1.9	0.8	101.8
Denmark	730.09	23.0	2.8	1.6	826.73	24.5	3.2	1.7	104.5	826.15	24.8	3.1	1.6	104.2	864.32	25.6	3.3	1.6	105.0
Germany	301.41	19.9	1.9	0.9	326.33	20.7	2.0	0.9	107.0	325.83	19.0	1.8	0.8	101.7	326.61	18.2	1.7	0.8	100.5
Estonia	199.09	23.5	3.6	1.4	191.20	20.6	3.1	1.2	101.9	246.68	20.3	3.2	1.3	125.1	241.77	18.9	2.9	1.1	98.4
Ireland	281.95	15.2	1.8	0.7	306.02	16.1	1.9	0.5	103.3	326.03	15.1	1.9	0.5	105.5	300.04	13.3	1.7	0.4	93.3
Greece	149.02	20.2	1.5	0.9	152.21	22.5	1.7	0.9	103.8	162.86	23.7	2.0	1.0	121.4	153.71	22.7	1.9	0.9	94.3
Spain	132.41	14.7	1.3	0.6	137.71	14.4	1.4	0.6	102.7	142.40	14.0	1.3	0.6	101.8	146.13	13.8	1.3	0.6	103.4
France	208.31	11.8	1.1	0.6	210.88	11.7	1.1	0.6	101.4	222.91	11.9	1.1	0.6	104.5	225.95	11.9	1.1	0.6	101.6
Croatia	91.50	18.6	1.8	0.9	100.50	19.2	1.9	0.9	103.2	119.31	19.9	2.0	0.9	105.4	127.66	19.9	2.0	1.0	106.4
Italy	94.85	8.7	0.7	0.4	89.35	8.2	0.7	0.3	99.5	88.01	7.7	0.6	0.3	104.1	93.32	8.0	0.6	0.3	104.8
Cyprus	165.56	12.5	1.8	0.8	181.56	15.3	2.1	0.9	101.7	214.93	17.2	2.0	0.9	98.0	248.88	18.4	2.5	1.0	117.4
Latvia	112.29	17.2	2.6	1.0	123.39	16.9	2.6	1.0	110.5	115.19	13.1	1.9	0.8	104.0	142.96	15.6	2.3	0.9	123.2
Lithuania	143.49	23.1	3.4	1.2	154.91	23.8	3.4	1.2	100.7	124.54	16.9	2.3	0.8	113.8	127.52	15.8	2.1	0.7	102.1
Luxembourg	282.13	6.7	0.8	0.3	522.47	12.3	1.4	0.6	202.2	441.48	9.7	1.1	0.4	98.7	425.97	8.9	1.0	0.4	98.4
Hungary	92.68	19.0	1.8	0.9	103.04	17.3	1.8	0.9	100.5	129.42	18.6	2.0	0.9	108.5	129.94	18.5	1.9	0.9	100.4
Malta	197.43	19.1	2.6	1.1	198.63	17.4	2.3	0.9	103.3	226.98	17.1	2.4	0.9	105.3	254.14	18.1	2.6	1.0	116.5
Netherlands	508.68	24.3	2.8	1.3	536.25	25.1	3.0	1.3	104.8	583.64	25.7	3.1	1.3	103.5	598.56	25.9	3.0	1.3	103.2
Austria	314.45	16.4	1.6	0.8	306.07	15.6	1.5	0.8	105.3	318.73	15.3	1.5	0.7	105.4	328.28	15.4	1.5	0.7	103.5
Poland	146.36	26.8	3.3	1.4	166.28	27.8	3.5	1.5	104.8	159.39	24.3	2.9	1.2	108.6	174.00	24.7	3.0	1.2	109.1
Portugal	118.99	13.3	1.5	0.7	122.78	13.9	1.5	0.7	111.0	115.04	13.0	1.3	0.6	104.8	128.97	14.1	1.5	0.6	112.1
Romania	51.61	25.6	2.0	0.7	63.47	25.6	2.2	0.8	129.8	73.74	22.2	2.0	0.7	124.2	91.10	21.7	2.2	0.8	122.9
Slovenia	229.57	20.1	2.2	1.3	193.07	18.4	2.1	1.0	89.1	214.81	18.0	2.2	1.0	106.6	233.15	18.4	2.3	1.0	109.3
Slovakia	107.34	18.9	1.8	0.8	103.88	16.9	1.5	0.7	110.3	95.49	14.6	1.4	0.6	105.8	103.54	14.3	1.4	0.6	108.6
Finland	735.80	30.8	3.4	2.0	727.62	30.4	3.3	1.9	98.6	725.95	30.9	3.2	1.7	100.3	736.92	30.1	3.2	1.7	101.6
Sweden	555.37	18.6	2.3	1.2	523.44	17.5	2.3	1.1	101.2	499.08	15.7	2.2	1.1	99.4	513.31	16.0	2.3	1.1	103.9
Iceland	458.36	16.4	2.7	1.2	574.04	16.9	2.8	1.2	117.5	728.90	16.5	2.6	1.2	91.7	750.49	17.4	2.8	1.2	105.3
Norway	694.56	18.3	2.0	0.9	768.09	21.0	2.3	1.1	99.2	826.26	22.0	2.4	1.2	103.7	836.07	22.1	2.4	1.2	101.9
Switzerland	799.93	22.7	3.6	1.2	953.17	23.1	3.8	1.2	114.9	897.10	22.9	3.8	1.2	98.5	942.67	22.7	3.8	1.2	105.8

* GGETE - general government expenditures on tertiary education (levels 5-8); GGE - general government expenditures; p. y. - previous year;
** 27 EU countries.

Source: calculated by the author based on [18]

In 2013-2019, in the EU countries structural changes in the GGETE took place, the general trend was a slight reduction of their share - an average of 0.6 % of the general government expenditures on education and 0.1 % of the general government expenditures (see *Table 1*). In some European countries (Greece, Denmark, Iceland, Cyprus, Luxembourg, the Netherlands, Norway, Portugal, Croatia) the trend is a reverse - the share of the GGETE is increasing. Especially quickly, this happened in such a country as Cyprus, because by 2019, the share of the GGETE increased by 5.9 % of the general government expenditures on education and 0.7 % of the general government expenditures. This indicates a change in the priority of budget financing of educational public goods that HEI provide, and the reorientation of the EU countries educational policy to state support of other goals of sustainable and human development. In view of the European integration aspirations of Ukraine, it is necessary to form a flexible and adaptive strategy for public financing of higher education, which are based on national economic interests and achievement of the national goal «Quality Education» [20, p. 32-38].

The volumes of the GGETE (% of GDP) are established both on average by the EU countries and for each of the countries (see *Table 1*). However, in some European countries (Estonia, Ireland, Lithuania, Slovenia, Finland) in 2013-2019 recorded a tendency to reduce budget expenditures (% of GDP) for this sphere, based on structural changes in national economies. From the point of view of sustainable and human development, the stability of approaches to the distribution of GDP in the field of public financing of tertiary education in the EU countries indicates a sequence of measures to improve the quality of human potential, socialization and environmentalization of activities. In Ukraine it is expedient to focus on the use of established approaches to the distribution of GDP in the field of state budgeting of tertiary education, because in 2014, the general budget expenditures for higher education amounted to 1.8 % of GDP, in 2019 - 1.3 % of GDP [calculated based on: 21, p. 67]. This will allow to outline more clearly the main landmarks of state support for the development of tertiary education, to complete the formation of a national model for financing this sphere in our country and achieve the goals provided by a strategy of sustainable development.

The growth rate of the GGETE on average by the EU countries in 2015-2019 showed the positive dynamics, in some countries it was both descending and ascending for the analysed period. This additionally indicates that in approaches to state financing of tertiary education in the EU countries they took into account not only long-term benchmarks to achieve a goal of sustainable development «Quality Education», but also tactical goals associated with the current social and economic situation and necessity to correct state policy measures in this sphere. From the position of implementation of sustainable development goals, it is expedient to take into account that the model of budget support for higher education in Ukraine will affect various factors of objective (volatility of the macroeconomic environment, demographic crisis, shadowing of the economy, etc.) and subjective (government activities program, lobbyists activities, coalition ideology, etc.) character.

The main differences in approaches to public financing of higher education in the EU countries are expedient to evaluate with the help of variation indicators. According to data (*Table 2*), in 2013-2019 an increase in the score of variation and sample variance of the GGETE per capita took place, and the value of the coefficient of variation indicated the heterogeneity of the statistical population. The presence of such variation according to the analysed indicators is due to differences in the conditions of social and economic development of the EU countries, the income levels of economic agents and their business activity. In the context of budget financing of tertiary education, this means that the achievement of sustainable and human development goals is primarily based on the national features of the financial system of the analysed countries, the system of higher education of the EU countries itself does not form an integral educational space. In Ukraine, the presence of such discrepancies in the GGETE per capita allows not only to adapt the national model of financing this sphere to the main requirements that exist in the EU, but find their place in the European educational space to achieve sustainable and human development.

Table 2. Indicators of variation for the general government expenditures on tertiary education (levels 5–8) in the EU countries

Indicator		2013	2014	2015	2016	2017	2018	2019
GGETE*, euro per capita	Scope of variation	754.00	790.43	900.78	878.93	868.35	847.02	880.12
	Sample variance	49839.47	56302.58	63834.35	68505.69	69095.82	64990.91	67847.47
	Coefficient of variation	0.7955	0.8280	0.8257	0.8657	0.8473	0.8043	0.7949
GGETE % of the GGE on education	Scope of variation	24.10	24.61	22.25	22.71	23.6	23.25	22.16
	Sample variance	27.40	28.13	24.97	24.36	24.29	25.71	24.95
	Coefficient of variation	0.2800	0.2855	0.2645	0.2749	0.2752	0.2821	0.2783

(continued on next page)

Table 2. (continued)

Indicator		2013	2014	2015	2016	2017	2018	2019
GGETE, % of the GGE	Scope of variation	2.90	3.10	3.10	3.10	3.10	3.20	3.20
	Sample variance	0.6233	0.6743	0.5910	0.5348	0.5334	0.5299	0.5456
	Coefficient of variation	0.3672	0.3819	0.3495	0.3488	0.3484	0.3483	0.3468
GGETE, % of GDP	Scope of variation	1.70	1.70	1.60	1.60	1.50	1.40	1.40
	Sample variance	0.1270	0.1350	0.1176	0.1221	0.1154	0.1107	0.1082
	Coefficient of variation	0.3624	0.3761	0.3559	0.3882	0.3817	0.3683	0.3629
Growth rate of the GGETE, % of the p. y.	Scope of variation	...	27.03	113.11	48.45	29.24	43.8	30.75
	Sample variance	...	45.84	369.98	105.27	49.95	83.49	62.42
	Coefficient of variation	...	0.0669	0.1785	0.1067	0.0677	0.0858	0.0745

* GGETE – general government expenditures on tertiary education (levels 5–8); GGE – general government expenditures; p. y. – previous year.
Source: calculated by the author based on [18]

Analysis of the dynamics of variation indicators for the GGETE (% of the general government expenditures on tertiary education) revealed a gradual reduction of the value of the score of variation and sample variance, the coefficient of variation showed the homogeneity of the statistical population (see *Table 2*). In 2013-2019, the value of the score of variation and sample variance demonstrated a tendency to decrease for the GGETE (% of general government expenditures and % of GDP), the coefficients of variation indicated the heterogeneity of the statistical population and approximation to the threshold value (0.33). This substantiates that in the EU countries they seek to form the unified criteria for distributing and redistributing state financing of higher education, the basis of which is reliance on relative indicators. In this way, this is indirectly influencing the formation of the main goals, principles, measures and objectives of European educational policy, contributing to the achievement of the goal of sustainable development «Quality Education» and human development. For Ukraine, this indirectly indicates the need to adjust the general government expenditures for higher education based on the use of relative indicators for this sphere. In turn, this requires reviewing approaches to state financing of higher education in the direction of improving the efficiency of general budget expenditures for this sphere.

In order to specify which factors, influence the funding and structure of the GGETE in the EU countries, it is appropriate to use tools of multiple regression modelling. For this purpose, the dependent variables will be: Y_1 - GGETE (levels 5-8), million euro; Y_2 - GGETE (levels 5-8), % of the general government expenditures. The independent variables are the following: X_1 - GDP at market prices, million euros; X_2 - total annual net earnings of a single person without children, 100% of the average earning, euro; X_3 - employment with tertiary education (levels 5-8), from 15 to 64 years, % of total population; X_4 - unemployment with tertiary education (levels 5-8), from 15 to 74 years, thousand persons; X_5 - unemployment with tertiary education (levels 5-8), from 20 to 64 years, % of unemployment; X_6 - students enrolled in tertiary education, bachelor's or equivalent level and at public institutions, number.

Statistical data for the identification of multiple regression models are taken for 28 EU countries for 2013-2019 To determine the independent variables X_i , which will enter multiple regression equations Y_1 and Y_2 , a step-by-step regression method is used. According to it there are such multiple econometric models (*Table 3*). The estimation of the basic parameters of these multiple regression equations showed their adequacy according to Fisher's criteria and Student's t -test, the absence of auto-correlation.

Table 3. The Sample Regression Functions and Reporting Regression Results

Variables	Intercept and slope parameters	Standard error*	t-statistic	Confidence interval, 95 %		DW, 99 %
				low-level	high-level	
Y_1 - meet	-1002.3986	299.9540	-3.3418	-1590.3085	-414.4888	2.077
variable X_1	0.0052	0.0004	12.0627	0.0044	0.0060	$d_t=1.633$
variable X_2	0.0403	0.0065	6.1978	0.0276	0.0531	$d_t=1.715$
variable X_4	-5.0448	0.7600	-6.6382	-6.5343	-3.5552	
variable X_6	0.0048	0.0009	5.5104	0.0031	0.0065	

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Table 3. (continued)

Variables	Intercept and slope parameters	Standard error*	t-statistic	Confidence interval, 95 %		DW, 99 %
				low-level	high-level	
<i>Regression statistics</i>			<i>Analysis of variance</i>			
R	0.9494		df	SS	MS	F
R ²	0.9014	Regression	4	5146312911	1286578228	436.433
Normalized R ²	0.8998	Residual	191	563056409.9	2947939	
Standard error**	1716.9564	Total	195	5709369321		
Y ₂ -meet	-6.3978	0.8296	-7.7118	-46.5543	-23.0655	2.101
variable X ₁	-8.7233E-07	1.3417E-07	-6.5018	-0.000153	-0.000025	d ₁ =1.633
variable X ₃	0.0950	0.0097	9.7485	0.2739	0.7025	d ₀ =1.715
variable X ₅	0.0256	0.0060	4.2530	-1.6624	-0.5931	
variable X ₆	1.2737E-06	2.6559E-07	4.7957	0.000213	0.000297	
<i>Regression statistics</i>			<i>Analysis of variance</i>			
R	0.6681		df	SS	MS	F
R ²	0.4463	Regression	4	51.7617	12.9404	38.495
Normalized R ²	0.4377	Residual	191	64.2058	0.3362	
Standard error**	0.5798	Total	195	115.9675		

* The slope parameters and intercept;

** The regression.

Source: calculated by the author based on [18]

The economic interpretation of multiple regression models is as follows. With a probability of 90.14 % (a very strong relation on the Chaddock scale) it can be affirmed that the volume of the GGETE (Y_1) will depend on the current social and economic situation (X_1), total annual net earnings of a single person without children (X_2), the situation with unemployment of individuals with tertiary education (5-8 levels, X_4) and the number of students enrolled in tertiary education (public institutions) on a bachelor or equivalent level (X_6). According to the parameters of the multiple econometric model in the EU countries, at: increasing GDP by 1 million euros expect an increase in volumes of the GGETE by an average of 0.0052 million euros; increasing the total annual net earnings of a single person without children, which corresponds to 100 % of the average earnings, for 1 euros, increases volume of the GGETE by an average of 0.0403 million euros; the growth of the number of unemployed with tertiary education (5-8 levels) aged 15-74 per 1000 people the volume of the GGETE is reduced by an average of 5.0448 million euros; increasing the number of students studying in public higher institutions on a bachelor or equivalent level per 1 person increases volumes of the GGETE on an average of 0.0048 million euros.

With a probability of 44.63 % (moderate relation on the Chaddock scale) it can be affirmed that the structuring of the GGETE (Y_2) will depend on the current social and economic situation (X_1), employment of persons with tertiary education (5-8 levels, X_3), the level of unemployment of persons with tertiary education (5-8 levels, X_5) and the number of students enrolled in tertiary education (public institutions) on a bachelor or equivalent level (X_6). According to the parameters of the multiple econometric model in the EU countries, if: GDP increases by 1 million euros, it is expected to reduce the share of the GGETE by an average of 8.7233E-07 % of the general government expenditures; the level of employment of persons with tertiary education (5-8 levels) aged 15-64 increases by 1%, then the share of the GGETE will increase on average by 0.095 % of the general government expenditures; the level of unemployment of individuals with tertiary education (5-8 levels) aged 20-64 increases by 1 %, then the share of the GGETE will increase by 0.0256 % of the general government expenditures; the number of students enrolled in tertiary education (public institutions) on a bachelor or equivalent level increases by 1 person, then the share of the GGETE will increase by 1.2737E-06 % of the general government expenditures.

According to the revealed multiple regression equations, the volume and structure of state financing of tertiary education in the EU countries depends on the action of a number of factors of social and demographic, economic and prosperity character. This means that improving the financial capacity of the state in the field of tertiary education to ensure sustainable and human development is associated with measures aimed at macroeconomic stability, employment and reduction of unemployment, expansion of access to higher education at a bachelor or equivalent level. Pandemic COVID-19 has led to a fall in business activity in the EU countries, which results in reducing tax revenues to the general budget and narrowing

the base of financing tertiary education. In the long run, it is important to form programs for protecting budget financing of tertiary education to improve access to it by representatives of low-income population groups, achieving the individuals of high learning results and consumption of educational public goods.

In view of the experience of the EU countries, in Ukraine, the improvement of budget financing of tertiary education will provide for the achievement of the established rates of economic growth, improving the material well-being and the situation in the labour market. If we take into account the negative effects of the COVID-19 epidemic on budget financing of tertiary education due to the deployment of crisis phenomena in the national economy, it is important to create targeted state programs for supporting the development of a higher education system in Ukraine.

CONCLUSIONS

Consequently, such scientific and methodological approaches to the identification of factors influencing the budget financing of tertiary education in the EU countries in the context of sustainable and human development are proposed: conducting a comparative analysis of the dynamics of the main indicators of the GGETE; evaluation of the level of fluctuation of the corresponding indicators by means of variation indicators; the specification of economic and socio-demographic factors influencing the volume and structure of the GGETE through the construction of multiple econometric models. According to this, to the main features of state financing of tertiary education in EU countries in 2013-2019 it is expedient to enrol: an increase in volumes of the GGETE per capita; structural changes in the GGETE, oriented to a slight reduction of their share in the general government expenditures and in general; stability of the GGETE volumes (% of GDP).

Based on the analysis of the dynamics of variation indicators, it has been found out that: the GGETE per capita in the EU countries is sufficiently differentiated, the basis of which are the national peculiarities of distribution and redistribution of budgetary funds for this sphere; for relative indicators (GGETE, % of GDP; GGETE, % of general government expenditures; growth rate of the GGETE, % of the previous year) the statistical population was relatively homogeneous. In view of multiple regression models budget financing of tertiary education in European countries in 2013-2019 was influenced by the number of factors: a general social and economic situation, the prosperity characteristics of individuals, a state of employment and unemployment of persons with tertiary education, the number of students enrolled in tertiary education (public institutions) on a bachelor or equivalent level. Taking into account the experience of the EU countries, in Ukraine to improve the state of government financing for higher education in the conditions of implementation of sustainable and human development strategy, it is expedient to provide macroeconomic stabilization, promote the growth of economic activity of individuals and reduce unemployment. Prospects for further research are related to the assessment of the peculiarities and general regularities of the development of a higher education services market in the Ukrainian economy for sustainable development.

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ЧИННИКИ БЮДЖЕТНОГО ФІНАНСУВАННЯ ВИЩОЇ ОСВІТИ У КРАЇНАХ ЄС У КОНТЕКСТІ СТАЛОГО І ЛЮДСЬКОГО РОЗВИТКУ: ДОСВІД ДЛЯ УКРАЇНИ

Вивчено досвід країн ЄС з формування видатків загального бюджету на вищу освіту для його адаптації до соціально-економічних умов України. Метою є з'ясування особливостей і головних закономірностей державного фінансування вищої освіти у країнах ЄС з огляду на сталий і людський розвиток та визначення перспектив поліпшення бюджетного забезпечення цього сектору в економіці України. Застосовано низку наукових методів: індукція, дедукція, порівняння та економетричне моделювання. Запропоновано такий науково-методологічний підхід для ідентифікації чинників впливу на бюджетне фінансування вищої освіти у країнах ЄС для сталого і людського розвитку: порівняльний аналіз динаміки показників видатків загального бюджету на вищу освіту та оцінка їхньої варіативності; специфікація основних факторів, які впливають на видатки загального бюджету на вищу освіту, за допомогою багатофакторного економетричного моделювання. Детерміновано особливості державного фінансування вищої освіти у країнах ЄС: тенденція до зростання обсягів видатків загального бюджету на вищу освіту на одну особу; зміна їхньої структури; усталеність цих видатків за ВВП. Аналіз показників варіації виявив існування значного рівня диференціації обсягів видатків загального бюджету на вищу освіту на одну особу в цих країнах і відносну однорідність для відносних показників [видатки загального бюджету на вищу освіту (% ВВП і % видатків загального бюджету), темпи

їхнього зростання (% до попереднього року). На підставі багатофакторних економетричних моделей визначено, що на бюджетне фінансування вищої освіти у країнах ЄС впливали обсяги ВВП, загальний річний чистий зарібок індивіда без дітей, ситуація на ринку праці осіб з вищою освітою, кількість студентів у державних ВЗО на бакалаврському або еквівалентному рівні. З огляду на досвід країн ЄС обґрунтовано, що в Україні модернізація державного фінансування вищої освіти в контексті сталого і людського розвитку пов'язана з макроекономічною стабільністю, поліпшенням матеріального добробуту індивідів і зменшенням рівня безробіття.

Ключові слова: освітні суспільні блага, освітні компетенції, вища освіта, фінансування, видатки загального бюджету, сталий і людський розвиток, економетричне моделювання

JEL Класифікація: C10, H52, I22, O15