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Contents

Editorial Words

Dear Distinguished Readers,

In the realm of academia, where the pursuit of knowledge and the sharing of wisdom take center stage, we are delighted to introduce the second issue of Volume 27 of the ASEJ Scientific Journal. This publication, in partnership with the Bielsko-Biala School of Finance and Law, continues to serve as a repository of intellectual exploration and a testament to the wealth of contemporary research.

Within the pages of this volume, a diverse collection of scholarly articles awaits. Each article represents a facet of our collective commitment to understanding the intricate tapestry of global concerns. From the realm of education to the intricacies of energy security, from the digital landscape to geopolitical intricacies, these articles provide valuable insights and open doors to meaningful discourse.

The essence of this volume lies in its unwavering dedication to furthering our comprehension of complex subjects. These articles, penned by experts and scholars who are leaders in their fields, are a testament to the rigorous examination and exploration of topics that resonate with our ever-evolving world.

As you embark on this intellectual journey through Volume 27, No. 2, we invite you to consider the broader tapestry of knowledge it presents. Each article adds depth and dimension to the ongoing conversations surrounding the most pressing issues of our time. Together, they form a mosaic of thought, offering fresh perspectives, innovative solutions, and a deeper understanding of the complexities that define our contemporary world.

These articles are more than words on paper; they represent the collective pursuit of wisdom and the desire to share it with our readers. In each piece, you will find the dedication of researchers who have invested their time, expertise, and energy to illuminate the issues at hand.

We encourage you to engage with these articles, to discuss and debate their findings, and to contribute to the ongoing dialogue that drives the pursuit of knowledge. We trust that this volume will not only inform but also inspire, and that the insights it offers will be a valuable addition to your intellectual journey.

The imperative role of risk management in ensuring the security of logistics processes within small service enterprises is illuminated, emphasizing the significance of mitigating risks in this sector. Safety management in the context of ISO 9000 quality management systems is dissected, underscoring the pivotal role of these systems in ensuring the safety and quality of organizations.

We invite you to immerse yourselves in this eclectic collection of scholarly works, each a beacon of knowledge and insight into these crucial subjects. The articles contained within this volume aspire to stimulate discussion, foster a deeper understanding, and inspire further exploration. We trust that the journey through these pages will be an intellectually enriching experience for all our readers.

Doc. Dr Kateryna Pilova
Editor of the ASEJ, Issue 2, Volume 27, 2023.

Economic and financial indicators of the higher education system: experience of Ukraine, Poland and Germany

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***Abstract*— The article is devoted to a comparative analysis of the main economic and financial indicators of the functioning of higher education in such countries as Ukraine, Poland, and Germany for the period 2010-2021. Considering the military aggression against Ukraine and the assistance of the specified neighboring states, such monitoring of statistical data is useful and can serve as a basis for further forecasts regarding the development of the higher education system in Europe. Although in the modern conditions of the multi-system crisis in Ukraine, any forecasting is a rather difficult matter.**

The main trends regarding the number of higher education institutions, the number of students and teachers, as the basic factors determining the effectiveness of the functioning of the higher education system in Ukraine, Poland and Germany, were determined. The article uses official statistical data from the State Statistics Service of Ukraine, Statistics Poland, and the German Federal Statistical Office.

The following indicators of financial policy in the education sector were analyzed, such as: budget expenditures in the education sector; Total balance sheet of enterprises in the education sector; financial results in the education sector; profitability of operating activities of the HEI; costs per student.

The following trends were identified in 2021 according to the cranes: Germany – increase in the number of staff, number of students, increase in financing of the education sector; Poland – increasing the number of students and funding, although not at such high rates as in Germany; stable number of personnel. Ukraine – reducing the number of students, employees and funding. The indicated trends and differences are due to economic, socio-demographic factors in each country. Despite the identified differences, it is necessary to develop international cooperation, which will positively affect the financial policy in the field of education.

Keywords— branching of the HEI network; demand and supply in the market of educational services; economic efficiency in the field of education; financial policy of HEI; statistical analysis; Ukraine; Poland; Germany.

I. INTRODUCTION

Financing of the education system is viewed by the international community as an investment in personal development, as the basis of human and social capital that ensures socioeconomic growth and competitiveness of the country. The legislation of the leading countries of the world defines the right of every citizen to receive formal, non-formal and informal education throughout life (pre-school, complete general secondary, out-of-school, vocational, professional, higher education, adult education).

The financial support of the education system has its own peculiarities in each country (wner.wes.org). In addition, education in many countries has undergone radical changes due to multisystemic crises. In particular, the Covid-19 pandemic has led to changes in the structure of the educational process, which has negatively affected the efficiency and effectiveness of education worldwide. The military aggression against Ukraine resulted in the migration of Ukrainian students and teachers. The governments of leading countries have created special conditions for education and integration of the Ukrainian educational community around the world. Therefore, the financial support of the education system plays an important role as never before.

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II. ANALYSIS OF RECENT RESEARCH

Financing models of higher education institutions in foreign countries were studied by such authors as: (Leshanych L., Miahkykh I., Shkoda M., 2019); comparative analysis of higher education financing models is studied in the works of (Praneviciene B., Pūraitė Aurelija, Vasiliauskienė Violeta, Simanaviciene Zaneta 2017); (Shust O., Hrynchuk Y., Rybak N., 2021); innovations in higher education financing (Varghese N.V., Jinusha Panigrahi, 2023).

The works of (Dan Lang, Pier-André Bouchard St-Amant, Martin Maltais, 2023) are devoted to the study of funding sources, in particular at the federal and regional levels of Education; (Kotlińska J., Nucinska J., Bednar J., 2021); (Papcunová V., Hornyák Gregáňová R., Hudakova J., 2020); (Skotnicka B., Mrózek S., 2023).

The financial policy in the field of education in Poland is studied in the works of (Kotlińska J., Nucinska J., Bednar J., 2021); (Trippner P., Jóźwicki R., 2022); formal, informal, informal education (Kowalska I., 2016); education financing for foreign students in Poland (Pogorzała E., 2023).

The mechanism of management and financing of education in Germany is studied in the works of (Küpper A., 2003); (Hans-Georg P., Markus K., 2008); (Stylianopoulos P., Hertner L., Heinz A., Penka S., 2023); financing academic mobility in Germany (Marcel Gérard, Silke Übelmesser, 2014); the financial mechanism for ensuring the education system in Europe (Lung M., Moldovan I., Lung A., 2012); (Zeynep Ozkok, 2016).

The financial policy in the education sector in Ukraine is studied in the scientific works of such scientists as: (Beztelesna L., Pliashko O., Shevchuk L., Petryk I., 2022); (Bykov I., 2023); (Malyshko V., Jaremenko L., Petryk B., 2022).

The financial aspect of the functioning of educational institutions of Ukraine in the conditions of military aggression and in the post-war period, the cooperation of Ukrainian higher education institutions and the European educational community was investigated in the works of (Tarasenko I., Tarasenko O., 2022); (Yurchyshena L., 2022).

The comparative analysis of the functioning and financial support of education systems in Ukraine, Poland and Germany is of scientific interest. This area of research is especially relevant in connection with the assistance provided by the international educational community and European countries in response to military aggression against Ukraine.

III. PRESENTATION OF THE MAIN MATERIAL

Monitoring the performance of higher education in Ukraine. Since the introduction of the Bologna Process, there has been a significant expansion of higher education systems, accompanied by significant reforms of degree structures and systems to ensure quality, compatibility, competitiveness and attractiveness for students. The structure of the education system, including the number of educational levels, varies from country to country(wener.wes.org). The peculiarities of the education system in different countries are primarily due to socio-demographic, economic and administrative factors (Lisun et all. 2022). For example, the number of students and teaching staff is determined by the total population of a country. For example, according to Digital Overview 2021(datareportal.com), the total population in Ukraine was 43,6 million people; in Poland – 37,82 million people; in Germany – 83,84 million people.

The financing of the education system is determined by the economic level of development of the country; the specifics of state regulation; and the availability and balance of individual and public funding. Financial resources are the main factor and driver that significantly affects supply and demand in the education market. In this case, we are talking about the financial capacity of the target audience to receive education on a paid basis. Creating a quality educational product requires significant expenditures from the HEI to ensure the work and professional development of academic staff; upgrade fixed assets and software of the HEI; and expenditures for international indexation of academic publications and developments of the HEI.

When studying the issue of financing higher education institutions, it is necessary to take into account the integration interaction with various market actors: interaction between other domestic and foreign higher education institutions; business structures; international integration of national higher education systems, which allows for the implementation of large research projects. This contributes to improving the quality of educational programmes and research; development and implementation of postgraduate and lifelong learning programmes. There are changes in financing instruments towards the transition from traditional financing approaches (based on input parameters) to results-based financing methods (based on output parameters) (Shust 2021, Yurchyshena 2022)

Education statistics vary somewhat by country, which makes data comparability difficult. Therefore, let us consider financial and economic indicators of the functioning of the higher education system by country: Ukraine, Poland, Germany. Monitoring the financial performance of the higher education system also requires a general overview of the development of the HEI network based on the following indicators: number of HEIs; number of students; number of admitted and graduated students; average number of staff; level of hiring and dismissal of employees.

For the sake of comparability, we provide information on the official exchange rate of the Ministry of Finance of Ukraine as of 30.06.2022: 1 USD. (USD) equals 29,25 hryvnias (UAH); 1 hryvnia (UAH) equals 6,56 Polish zlotys (PLN) (minfin.com.ua)

Financial and economic indicators of the functioning of the higher education system in Ukraine. As of the 2021/2022 academic year, there were 386 higher education institutions in Ukraine with 1047,0 thousand students (Table 1).

Over the period 2000-2021, the number of HEIs in Ukraine increased from 315 to 386 institutions. At the same time, the

total number of students decreased from 1402,9 thousand in 2000 to 1047,0 thousand in 2021, which is a negative phenomenon. The decline in the number of students has been observed since 2015, due to demographic and economic factors in the country (Ukrastat 2021).

TABLE 1. INSTITUTIONS OF HIGHER EDUCATION FOR 2000-2021

	2000	**2005**	**2010**	**2015**	**2019**	**2021**	**2021/ 2000**	**2021/ 2019**
Number of higher education institutions	315	345	349	288	281	386	1,22	1,37
Number of students, thousand	1402,9	2203,8	2129,8	1375,2	1266,1	1047,0	0,74	0,82
Number of people admitted to study, thousand.	346,4	503,03	392,03	259,93	250,13	239,21	0,69	0,95
Number of people graduating from higher education institutions, thousand	273,6	372,44	543,74	374,04	333,64	261,78	0,95	0,78
The ratio of the number of people admitted to study to the number of graduates	1,27	1,35	0,72	0,69	0,75	0,91	0,71	1,21

Source: based on: (Ukrastat 2017, p.126; Ukrastat 2019, p.123; Ukrastat 2021, p. 113)

The admission and graduation of specialists by higher education institutions by sources of funding for their education in 2021 shows that 42,3% of those admitted to study were funded by the budget. By educational degree, the proportion of masters who studied at the expense of the budget in 2020 was 47,5% (Ukrastat 2021, p. 120).

An analysis of the distribution of universities, academies, and institutes by region shows that in 2021/2022 the highest concentration of higher education institutions is characteristic of the following regions: Kyiv city – 83 (253,8 thousand students); Kharkiv region – 46 (122,4 thousand students); Dnipro region – 39 (70,3 thousand students); Lviv region – 21 (90,4 thousand students); Odesa region – 22 (67,7 thousand students); Zaporizhzhia region – 14 (46,0 thousand students) (Ukrastat 2021 p. 121)

The number of business entities in the field of education increased from 10,8 to 17,9 thousand in 2010–2021. Individual entrepreneurs predominate in the field of education, with a share of 84,9% as of 2021; the share of small enterprises in the field of education in 2021 was 98,0%. Despite the structural advantage of individual entrepreneurs in the education sector, the largest volumes of products (services) sold and the number of employees are accounted for by large enterprises (large HEIs). (Ukrastat 2021, p. 380)

The average number of full-time employees in the education sector decreased from 1668 thousand in 2010 to 1157 thousand in 2021, which was 69% of the 2010 year level (Table 2).

TABLE 2. AVERAGE NUMBER OF FULL-TIME EMPLOYEES IN EDUCATION FOR 2010-2021

	2010	**2015**	**2019**	**2020**	**2021**	**2020/ 2010**	**2021/ 2010**
Total by type of economic activity, thousand people	10758	8065	7443	7345	7096	0,68	
Education, thousand people	**1668**	**1434**	**1315**	**1319**	**1157**	**0,79**	**0,69**

Source: (Ukrastat 2019, Ukrastat 2021)

The average number of full-time employees is determined by staff movements, in particular, the level of hiring and dismissal. In the education sector, the rate of dismissals (15,9% in 2020) exceeds the rate of recruitment (14,3% in 2020), which leads to a reduction in the number of full-time employees. A more favourable situation was observed in 2021: the rate of recruitment (21,2%) exceeded the rate of dismissal (17,9%) (Table 3).

TABLE 3 RECRUITMENT AND DISMISSAL RATES IN THE EDUCATION SECTOR (% OF THE AVERAGE NUMBER OF FULL-TIME EMPLOYEES)

	2010	**2015**	**2019**	**2020**	**2021**	**2021-2010**	**2021-2020**
Total by type of economic activity							
Accepted, %	25,3	20,4	28,2	24,9	28,7	+3,4	+3,8
Dismissed, %.	28,1	30,2	32,7	29,3	30,8	+2,7	+1,5
Education							
Accepted, %	13,2	14,1	15,2	14,3	21,2	+8,0	+6,9
Released, %	13,3	15,5	17,4	15,9	17,9	+4,6	+2,0

Source: (Ukrastat 2017, p. 69; Ukrastat 2019, p.64; Ukrastat 2020, p.62;Ukrastat 2021, p.61)

In the field of education, 1497 hours were worked per full-time employee in 2021, which is 75,1% of the time sheet. For comparison: in the field of information and telecommunications – 1731 hours (86,8% of the time sheet); in the field of professional, scientific and technical activities – 1620 hours (81,2% of the time sheet) (Ukrastat 2021, p.62).

Financing education accounts for a significant portion of Ukraine's budget expenditures. Over the period 2005–2021, the total budget expenditures in the field of education increased in absolute terms from UAH 26801,8 million in 2005 to UAH 312917,9 million in 2020 (Table 4).

TABLE 4 UKRAINE'S BUDGET EXPENDITURES IN THE EDUCATION SECTOR IN 2005-2021

Year	Consolidated, UAH million	including			
		state		local	
		in total, UAH million	percentage of the consolidated budget, %	in total, UAH million	percentage of the consolidated budget, %
2005	26801,8	9932,8	37,1	16869,0	62,9
2010	79826,0	28807,5	36,1	51018,5	63,9
2015	114193,5	30185,7	26,4	84007,8	73,6
2018	210032,3	44324,3	21,1	165708,0	78,9
2019	238758,7	51656,6	21,6	187102,1	78,4
2020	252283,7	52857,8	21,0	199425,9	79,0
2021	312917,9	63839,7	20,4	4 249078,3	79,6

Source: (Ukrastat 2015, p. 214; Ukrastat 2020, p.205; Ukrastat 2021, p. 203)

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Consolidated budget expenditures are formed from relevant expenditures at the state and local levels. In 2021, the share of education expenditures from the state budget in total consolidated budget expenditures on education was 20,4%; from the local budget – 79,6%. Over the period 2005–2020, the contribution of the state budget to the expenditures of the consolidated budget of Ukraine in the field of education decreased from 37,1% to 20,4%; at the local budget level, it increased from 62,9% to 79,6%. Thus, the largest financial burden in the education sector is borne by local budgets as a source of funding compared to the state budget. The volume of products sold in the education sector increased from UAH 1943,8 thousand to UAH 16649,7 thousand in 2010–2021 (more than 5.8 times, but inflation should also be taken into account and figures should be compared in comparable prices). In 2010, the share of products (services) sold by enterprises in the education sector was 79,9%, and in 2021 it was only 43,5%. Thus, individual entrepreneurs have intensified their activities, with their share in the education sector increasing from 20,1% to 56,5% between 2010 and 2021 (Table 5).

TABLE 5. VOLUME OF PRODUCTS (GOODS AND SERVICES) SOLD BY BUSINESS ENTITIES IN THE EDUCATION SECTOR IN 2010-2020

	2010	**2015**	**2019**	**2020**	**2021**	**2021/ 2010**	**2021/ 2020**
Education, UAH mn	1943,8	3101,7	9905,6	11357,1	16649,7	8,5	1,46
enterprises,%	79,9	63,7	51,5	48,1	43,5	0,54	0,90
individual entrepreneurs,%	20,1	36,3	48,5	51,9	56,5	2,8	1,08

Source:(Ukrastat 2015, p. 444; Ukrastat 2017, p.445; Ukrastat 2019, p. 393, Ukrastat 2021, p. 385)

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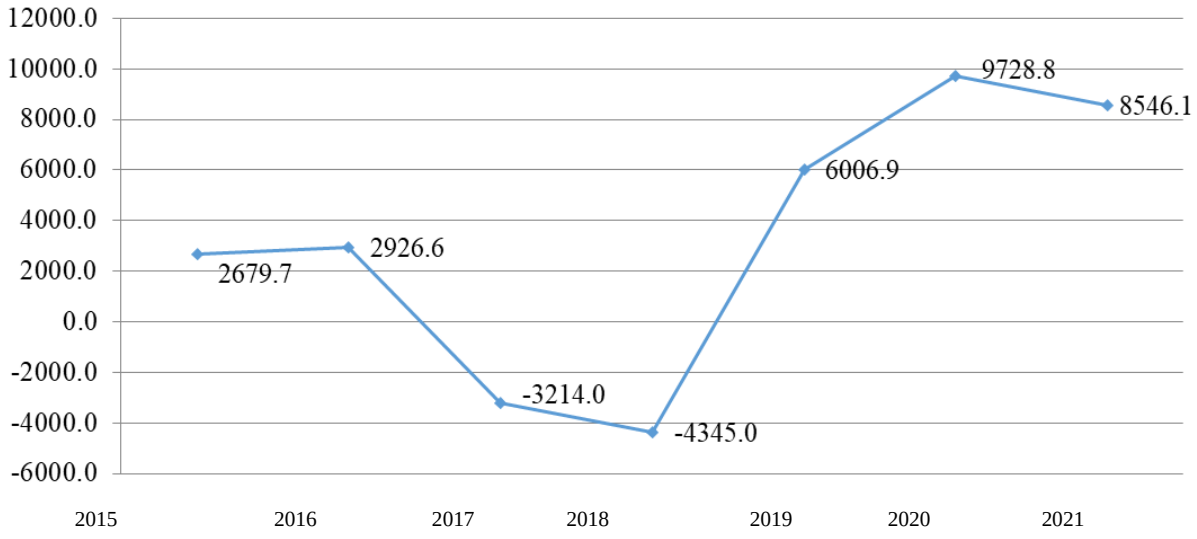
The volume of products sold, services rendered and other operating activities generate financial income. At the same time, financial expenses are required to create products and services in the field of education. The generalised financial indicator of the functioning of an economic entity is the balance sheet total. An increase in the balance sheet total at the end of the reporting period is a positive development. Thus, the total balance sheet of enterprises in the field of education for the period 2015–2020 increased by 3,6 times, from UAH 2679,7 million in 2015 to UAH 8546,1 million in 2021.

FIGURE 1 TOTAL BALANCE SHEET OF ENTERPRISES IN THE EDUCATION SECTOR IN 2015-2021



Developed by the author based on: Ukrastat 2021, p. 401

In 2010–2021, the financial result (balance) of the activities of enterprises in the education sector increased from UAH 88,3 million to UAH 126,7 million. In 2021, losses (UAH 414,7 million) were lower than profits (UAH 541,4 million). The share of companies that made losses in 2021 was 33,9%. Over the past 10 years, from 2010 to 2020, the share of unprofitable

enterprises in the education sector of Ukraine has not significantly decreased, which is a negative phenomenon and indicates the need to find ways to strengthen the financial sustainability of enterprises in the education sector (Table 6).

TABLE 6. FINANCIAL RESULTS (BEFORE TAX) IN THE EDUCATION SECTOR OF UKRAINE FOR 2010-2021

	2010	**2015**	**2018**	**2019**	**2020**	**2021**	**2021/ 2010**	**2021/ 2020**
financial result (balance), UAH million	88,3	105,3	178,6	377,7	143,8	126,7	1,43	0,88
Profit, UAH million	163,1	225,7	363,5	558,2	551,5	541,4	3,31	0,98
loss, UAH million	74,8	120,4	184,9	180,5	407,7	414,7	5,54	1,01
Share of enterprises that incurred a loss,%	35,7	28,5	30,0	31,1	33,6	33,9	0,94	1,01

Developed based on kiev.ukrastat.gov.ua

The profitability of enterprises in the education sector was 5,6% in 2021. During 2010–2021, the lowest level of profitability of 3,7% was observed in 2017, and the highest 11,0% in 2019 (Table 7). The information and telecommunications sector did not experience any significant financial shocks and in 2017–2020 demonstrated an increase in operating profitability of 13–15% (Table 7). For comparison, the profitability of other types of economic activity in 2020 was as follows: industrial production 11,2%; wholesale and retail trade; repair of motor vehicles and motorcycles 17,9%; administrative and support services 7,1%. During 2010–2019, the profitability of operating activities in the healthcare and social assistance sector did not exceed 4,5%, and in 2020 it was 11,2%, which is explained by the difficult situation with the COVID19 pandemic (Table 7).

TABLE 7. PROFITABILITY OF OPERATING ACTIVITIES BY TYPES OF ECONOMIC ACTIVITY IN UKRAINE FOR 2010-2021

	2010	**2015**	**2018**	**2019**	**2020**	**2021**	**2021-2010**
Total, %	4,0	1,0	8,1	10,4	6,2	12,6	+6,4
Industry, %	3,5	0,9	6,3	5,8	3,9	11,2	+7,7
Wholesale and retail trade; repair of motor vehicles and motorcycles,%	9,8	–0,9	23,3	25,7	16,2	17,9	+8,1
Information and telecommunications,%	7,4	0,5	13,1	15,4	14,7	15,6	+8,2
Professional, scientific and technical activities,%	–6,6	–1,1	8,9	23,7	2,4	4,1	+10,7
Activities in the field of administrative and support services, %	–3,3	–11,9	0,1	7,0	5,5	7,1	+10,4
Education,%	4,9	5,7	5,8	11,0	7,1	5,6	+0,7
Healthcare and social assistance, %	4,0	–0,6	3,7	3,0	11,2	0,0	–4,0
Arts, sports, entertainment and recreation,%	–26,9	–25,3	–1,5	1,5	–10,6	–12,5	–1,9

Source: Based on kiev.ukrastat.gov.ua

The situation with the COVID-19 pandemic has had a significant impact on medicine and healthcare, the provision of educational services, as well as on processes in the field of information and telecommunications. In 2019–2020, the provision of educational services took place in a mixed format, but mostly online. The arts, sports, entertainment, and recreation sector was also negatively affected and restricted by the COVID-19 pandemic. At the same time, art, entertainment and recreation have also moved online, which contributes to the development of new applied technologies in the field of graphics and visual content, music and communication.

In general, education expenditures account for the smallest share in the structure of household expenditures by major consumer expenditure items in 2010-2020. The number of people enrolled in higher education institutions is significantly affected by the turbulence and dynamism of society, as the development of digital technologies has given rise to new modern virtual learning technologies (which was also facilitated by the COVID-19 pandemic).

Monitoring the performance of higher education in Poland. Poland is a neighbouring country to Ukraine, so let's analyse the financial and economic support for the functioning of the higher education system in Poland. Statistical data on the functioning of the higher education system in Poland According to official statistics (POL-on register), in the 2020/21 academic year, 368 higher education institutions operated on the Polish education market. The total number of students in all Polish higher education institutions in 2020 was 1,218 million. The share of students enrolled in public higher education institutions in 2020/21 was 69,89% of the total number of students. At the same time, in 2020/21, the number of students in non-state HEIs increased by 7% (Table 8).

The number of students enrolled in Polish higher education institutions in 2005–2019 decreased from 1953,8 thousand to 1230,3 thousand. In 2019, the number of students in Polish HEIs was only 62,96% of the same indicator in 2005 (Table 8). The Polish higher education system is represented by higher education institutions of various types (Table 9) Due to changes in the Polish education system, starting in 2019, the distribution of HEIs by type of institution is different, as shown in Table 10

TABLE 8. NUMBER OF STUDENTS IN POLISH HEIS IN 2005-2020

	2005	**2010**	**2015**	**2018**	**2019**	**2020**	**2020/ 2005**
Total number of students, thousand	1953,8	1841,3	1405,1	1230,3	1204,0	1218,0	0,62
Number of students in state-owned HEIs, thousand	1333,0	1261,2	1075,2	901,8	862,34	851,35	0,63
Share of students in state-owned higher education institutions, %.	*68,22*	*68,49*	*76,52*	*73,29*	*71,62*	*69,89*	*1,02*
Number of students in non-governmental HEIs, thousand	620,8	580,1	329,9	328,5	341,66	366,70	0,59
Share of students of nongovernmental higher education institutions, %	*31,78*	*31,51*	*23,48*	*26,71*	*28,38*	*30,11*	*0,94*

Source: Based on (GUS 2019, p.33, GUS 2020, p.16)

TABLE 9. NUMBER OF STUDENTS IN POLAND BY TYPES OF HIGHER EDUCATION INSTITUTIONS IN 2005-2018

	2005	**2010**	**2015**	**2018**	**2018/ 2015**
Total number of students, thousand	1953,8	1841,3	1405,1	1230,3	0,8756
Universities	563,1	526,8	422,2	363,6	0,8612
Higher schools of technology	331,1	318,7	301,4	235,1	0,7800
Higher schools of agriculture	107,7	80,5	70,8	56,7	0,8008
Higher schools of economics	407,8	278,4	179,8	173,4	0,9644
Higher schools of pedagogy	111,8	102,5	46,1	39,9	0,8655
Medical universities	48,8	62,0	60,6	65,4	1,0792
Maritime universities	11,5	10,4	9,4	7,4	0,7872
Higher schools of sport	28,2	27,6	24,7	19,4	0,7854
Higher schools of arts	15,4	16,4	16,9	16,8	0,9940
Higher schools of theology	10,4	6,8	5,5	5,0	0,9090
Higher schools of the Ministry of National Defence and Ministry of the Interior and Administration	14,0	23,7	29,7	22,3	0,7508
Other higher education institutions	304,2	387,4	237,9	225,2	0,9466

Source: Based on GUS 2019, GUS 2020

TABLE 10. NUMBER OF STUDENTS IN POLISH HIGHER EDUCATION INSTITUTIONS IN 2019-2020

	2019	**2020**	**2020/ 2019**	Share of HEIs in the total number of students, %	
				2019	**2020**
Total number of students, thousand	**1203998**	**1218046**	**1,011**	**100**	**100**
HEIs supervised by the minister responsible for higher education	1077787	1091492	1,0127	89,52	89,61
HEIs supervised by the minister responsible for health	66145	67050	1,0137	5,49	5,50
HEIs supervised by the minister responsible for maritime economy	6597	6540	0,9913	0,55	0,54
HEIs supervised by the minister responsible for culture and protection of national heritage	15833	15906	1,005	1,32	1,31
HEIs supervised by the minister responsible for national defence	16820	16608	0,9874	1,40	1,36
HEIs supervised by the Ministry of the interior and administration	4229	–	–	0,35	–
HEIs supervised by the minister responsible for internal affairs and the minister responsible for justice	50	4146	82,92	0,42	0,34
HEIs run by churches and other religious associations	16537	16304	0,9859	1,37	1,34%

Source: Based on GUS 2019, p. 17

Higher education institutions in Poland are subordinated to a number of specialised ministries, such as: the minister responsible for higher education; the minister responsible for health; the minister responsible for maritime economy; the minister responsible for culture and protection of national heritage; the minister responsible for national defence; the minister responsible for internal affairs and the minister responsible for justice. Some higher education institutions are also subordinated to churches and other religious associations. In 2020, the vast majority of higher education institutions (89,61%) were subordinated to the Ministry of Higher Education (minister responsible for higher education).

According to 2018 data (GUS 2019, p. 15), the largest Polish higher education institutions that provide training for a significant number of students in popular specialities are: University of Warsaw; Jagiellonian University in Cracow; Adam Mickiewicz University in Poznań; Warsaw University of Technology; University of Lodz; University of Wrocław; AGH University of Science and Technology in Cracow; University of Gdańsk; University of Silesia in Katowice; Nicolaus Copernicus University in Toruń; Maria Curie-Skłodowska University in Lublin.

In 2021, the most popular fields of study chosen by students in Poland were: business and administration – 18,2% of the total number of students; medicine and healthcare – 12,1%; social and behavioural sciences – 10,8%; engineering – 8,2%; education – 6,2%; and philology – 5,2% (Table 11).

TABLE 11. THE MOST POPULAR FIELDS OF KNOWLEDGE IN POLAND FOR 2015-2021 (% OF THE TOTAL NUMBER OF STUDENTS)

	2015	**2018**	**2019**	**2020**	**2021**	**2021/ 2015**	**2021/ 2020**
business and administration	18,6	17,9	18,1	18,1	18,2	0,97	1,01
medicine and healthcare	8,8	10,8	10,9	11,3	12,1	1,37	1,07
social and behavioural sciences	9,7	9,9	9,7	10,3	10,8	1,11	1,05
engineering	10,8	10,3	8,9	8,7	8,2	0,76	0,94
education	8,0	6,8	6,4	6,3	6,2	0,77	0,98
philology	5,3	5,2	5,2	5,2	5,2	0,99	1,00
others	38,8	39,1	40,8	40,1	39,9	–	–

Source: Based on GUS 2018, p.20, GUS 2019, p.11, GUS 2020, p.1

A significant number of foreign students study in Polish HEIs, the number of which increased by 7,75 times between 2005 and 2018 (Table 12)

TABLE 12. NUMBER OF FOREIGN STUDENTS IN POLISH HIGHER EDUCATION INSTITUTIONS FOR 2005-2020

	2005	2010	2015	2016	2018	2020
NUMBER OF INTERNATIONAL STUDENTS	10092	21474	57119	65793	78259	84689
INDEX OF CHANGE IN THE INDICATOR COMPARED TO THE PREVIOUS PERIOD IN THE TABLE	–	2,13	2,66	1,15	1,08	1,08

Source: Based on GUS 2019, GUS 2020

According to official statistics (POL-on register stat.gov.pl), in 2020/21 academic year the number of foreign students in Poland was 84689, of which about 49,83% (42201 people) studied at public HEIs; about 50,17% (42488 people) at non-public HEIs. Most foreign students are represented by the following countries: Ukraine (50,1%), India (4,6%), Spain (2,7%), Turkey (2,5%), Czech Republic (2,1%).

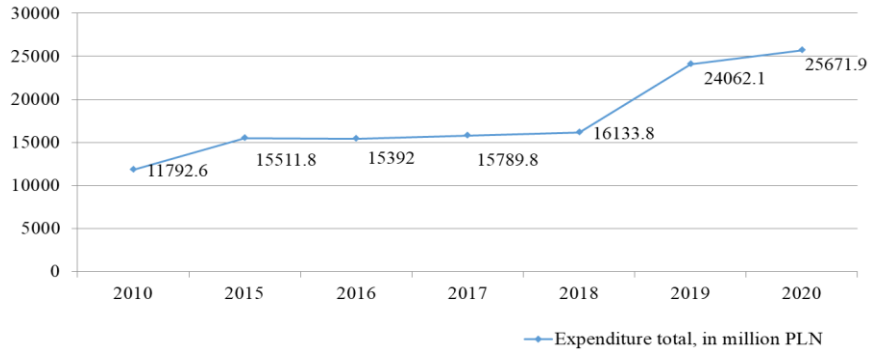
The total number of employees in Polish HEIs in the 2020/2021 academic year was 161124 people, of which the teaching staff – 54,79%; non-teaching staff – 45,21% (Table 13). The teaching staff, as of 2020/21 academic year, in general, in Polish HEIs is characterised by the following structure: professors – 29,43%; assistant professors – 43,97%; assistant lectures – 14,23%. [2, C. 126]. Budget expenditures on higher education in Poland increased by 2,17 times between 2010 and 2020, from PLN 11792,6 million to PLN 25671,9 million (Fig. 2). The share of state budget expenditures in Poland's GDP in 2020 was 1,1%. The state budget predominates as a source of funding, while local budget expenditures on education are much smaller (Table .14)

TABLE 13. THE NUMBER OF FULL-TIME SCIENTIFIC AND PEDAGOGICAL AND NON-PEDAGOGICAL EMPLOYEES OF POLISH HIGHER EDUCATION INSTITUTIONS FOR 2019-2020

	2019/20	**2020/21**	**2020/ 2019**	**2021/ 2020**
Academic teachers and non-teaching employees	160433	161124	1,003	1,004
Academic teachers, total	88675	88284	0,995	0,996
Non-teaching employees, total	71758	72840	1,014	1,015

Source: Based on GUS 2019, GUS 2020

FIGURE 2 TOTAL EXPERDITURE ON EDUCATION IN POLAND FOR 2010-2020, MILLION ZLOTYS



Source: Based on stat.gov.pl

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TABLE 14. STATE BUDGET EXPENDITURES ON HIGHER EDUCATION IN POLAND FOR 2010-2020

	2010	**2015**	**2018**	**2019**	**2020**	**2020/ 2010**
Total expenses, million PLN	11792,6	15511,8	16133,8	24062,1	25671,9	2,17
– state budget expenditures, million PLN	11722,4	15477,7	16093,9	24008,0	25613,9	2,18
– local budget expenditures, million PLN	70,2	34,1	39,9	54,1	58,0	0,83
Share of public expenditure in GDP, %	0,71	0,72	0,76	1,06	1,10	+0,39

Source: Based on stat.gov.pl

Expenditures on higher education institutions of all forms of ownership in Poland in 2020 totalled PLN 26941221,2 thousand. Expenditures per student totalled PLN 23164; expenditures per student in state-owned HEIs amounted to PLN 28622; expenditures per student in non-state-owned HEIs amounted to PLN 8673 (Table 15). In 2020, the total revenues of Polish higher education institutions amounted to PLN 27,386.6 million, of which 24,372.1 million were from state-owned institutions, which is 2.8% less than in 2019. Total revenues in the Polish higher education system in 2020 exceeded expenses and amounted to PLN 27386628,6 thousand. The net financial result of the Polish higher education system in 2019 amounted to PLN 1924644,6 thousand, which is almost 2,74 times higher than in 2018.

In 2020, the net financial result of the higher education system amounted to PLN 1275207.8 thousand, which was only 66% of the same indicator in 2019. In 2020, the net financial result of public HEIs decreased and amounted to 54% of the level of 2019. In contrast, the net financial result of non-public HEIs increased by 2% in 2020 compared to 2019 (Table 16). The main source of operating income of Polish public HEIs in 2020 was the state grant aimed at maintaining teaching and research potential (70.4%). At the same time, nongovernmental HEIs in Poland received their income in 2020 mainly from fees for educational services (76,5%) (Table 17). The net financial performance of Polish HEIs in the period 2015–2020 increased from PLN 607,9 million to PLN 1275,2 million (Table 18).

TABLE 15. COSTS PER STUDENT IN POLAND IN 2020/2021

	Expenditure on education, thousand PLN	**Expenditure per student, PLN**	**Share of scholarship fund expenditures in total education expenditures, %.**
Total	26941221,2	23164	5,4
State higher education institutions	24066780,3	28622	4,7
Non-governmental higher education institutions	2874440,9	8673	11,3

Source: Based on stat.gov.pl

TABLE 16. KEY FINANCIAL INDICATORS OF POLISH HEIS FOR 2018-2020, THOUSAND PLN

	2018	2019	2020	2019/ 2018	2020/ 2019
Total HEIs					
Total revenues	24591938,2	28170918,1	27386628,6	1,15	0,97
Total costs	23885775,6	26241826,9	26107003,9	1,10	0,99
Gross financial result	706162,6	1929091,2	1279624,7	2,73	0,66
Taxes and duties	3124,6	4446,6	4416,9	1,42	0,99
Net financial result	703038,0	1924644,6	1275207,8	2,74	0,66

Source: Based on (GUS 2018, p. 240, GUS 2019, p. 205, GSU 2020, p. 151)

TABLE 17. BREAKDOWN OF OPERATING INCOME BY SOURCE OF INCOME POLISH HIGHER EDUCATION INSTITUTIONS IN 2020

	State HEI	Nonstate HEI
Subsidy to support teaching and research potential, %	70,4	9,8
Subsidies from the state budget, %	4,9	2,5
Fee for educational services, %	7,6	76,5
Funds for projects funded by the National Research and Development Centre, %	1,4	2,8
Funds for projects funded by the National Science Centre, %	2,7	0,5
Other sources of income, %	13,0	7,9
Total, %	100	100

Source: Based on GUS, 2020, p. 15

TABLE 18. NET FINANCIAL RESULT OF THE ACTIVITIES OF POLISH UNIVERSITIES IN 2015-2021

	2015	2016	2017	2018	2019	2020	2021
Net financial result, million PLN							
Total universities	*607,9*	*562,2*	*699,9*	*703,0*	*1924,6*	*1275,2*	*1405,3*
State universities	655,2	549,3	653,1	630,3	1763,0	949,2	961,3
Non-state universities	-47,3	12,9	46,8	72,7	161,6	326,0	444,0
Index of changes in the indicator compared to the previous period							
Total universities	–	*0,925*	*1,245*	*1,004*	*2,730*	*0,662*	*1,102*

Source: Based on (GUS 2018-2021)

The most financially productive period was 2018–2019 (the net financial result of Polish HEIs increased by 2,73 times). In 2020, due to the Covid-19 pandemic, this indicator decreased significantly and amounted to 66,2% of the 2019 level. Thus, we can conclude that the market of educational services in Poland operates in a competitive environment and globalisation.

The issues of student recruitment, staffing, financing, and foreign cooperation remain relevant. At the same time, cooperation between Ukraine and Poland plays an important role as a partnership of neighbouring states, especially in the context of the global Covid-19 crisis and military aggression against Ukraine.

Monitoring the performance of higher education in Germany. The performance of the education sector is determined mainly by demographic indicators for the country, such as the population, which in Germany in 2021 was 83,237 million people. The total number of students in German higher education institutions was 2,941 million, including 440,000 foreign students. Over the period 2005–2020, the total number of students increased from 1,985 thousand to 2,941 thousand. The number of foreign students almost doubled from 248,357 thousand in 2005 to 440,564 thousand in 2021 (Table 19).

TABLE 19. INFORMATION ON THE NUMBER OF STUDENTS IN HIGHER EDUCATION INSTITUTIONS IN GERMANY FOR 2005–2020

	2005	**2010**	**2015**	**2019**	**2020**	**2021**
Total number of students, million people	1,985	2,217	2,757	2,891	2,944	2,941
Index of change in the indicator compared to the previous period	–	*1,12*	*1,24*	*1,04*	*1,01*	*0,99*
Number of foreign students, thousand people	248,357	252,03	340,305	411,601	416,437	440,564
Index of change in the indicator compared to the previous period	–	*1,014*	*1,35*	*1,209*	*1,011*	*1,057*

Source: Based on genesis.destatis.de

The number of first-year students in German HEIs increased by a third between 2005 and 2021, from 299,839 thousand in 2005 to 395,845 thousand in 2021. The number of international students in the first year of study doubled from 47,840 thousand in 2005 to 86,146 thousand in 2021.

The most popular fields of study in Germany in terms of the number of students in 2021 were: business administration – 240,866 thousand people; electronics – 64,404 thousand people; pedagogy – 61,591 thousand people; engineering sciences – 57,930 thousand people; English philology – 48,558 thousand people. people; chemistry – 41.687 thousand people; architecture – 41.570 thousand people; medical sciences/medical management – 40.203 thousand people; graphic design/communication design – 25.773 thousand people; agricultural sciences – 15.682 thousand people; automotive engineering – 12.355 thousand people.

In general, in 2015-2021, the total number of academic staff in Germany increased by 11% from 385,311 to 427,698. The number of administrative, technical and service personnel increased by 18% in 2015-2021, from 299,074 to 354,484 thousand people (Table 20).

TABLE 20. THE NUMBER AND STRUCTURE OF SCIENTIFIC-PEDAGOGICAL AND NON-PEDAGOGICAL EMPLOYEES OF THE GERMAN HIGHER EDUCATION SYSTEM FOR 2015-2021

	2015		**2019**	**2020**	**2021**		**2021/ 2015**
	thousand people	**%**	thousand people	thousand people	thousand people	**%**	thousand people
Total academic and creative arts staff, including	385,311	56,31	406,659	414,832	427,698	54,75	1,11
– full-time employees	239,200	62,08	260,611	269,275	275,599	64,43	1,15
– part-time workers	146,111	37,92	146,048	145,557	152,099	35,57	1,04
Total administrative, technical and service personnel	299,074	43,69	331,103	344,233	353,484	45,25	1,18
Total	684,385	100	737,762	759,065	781,182	100	1,14

Source: Based on genesis.destatis.de

The share of academic staff in the total staff structure of the German higher education system in 2021 was 54,75%. The share of part-time employees was 35,60% (Table 20). By staff category in 2021, professors accounted for 18,27%; academic and creative arts staff – 76,47%.

Analysing the change in the structure of academic and non-academic staff of the German higher education system in 2015–2021, it should be noted that in 2021, compared to 2015, the number of library staff decreased by 11% and there was an increase in the number of medical staff of higher education institutions by 23%, which can be explained by the processes caused by the Covid-19 pandemic (Table 21) In 2021, compared to 2020, there was a 4% reduction in library staff and a 3% reduction in technical staff (Table 21). Such trends are also explained by the active use of digital technologies at the level of individual users in learning and processes that support the educational process.

Expenditures on higher education in Germany in 2021 amounted to 67.201 million EUR.. Over the period 2010–2021, spending on education in Germany increased by 63%, from 41,149 to 67,201 million EUR. (Table 22)..

TABLE 21. NUMBER OF ACADEMIC AND NON-ACADEMIC STAFF OF THE GERMAN HIGHER EDUCATION SYSTEM IN 2015-2021, THOUSAND PEOPLE

	2015	2019	2020	2021	2021/ 2015	2021/ 2020
Full-time employees	**294,811**	**325,179**	**338,666**	**347,482**	**1,17**	**1,026**
Administrative staff	89,697	106,984	109,859	113,138	1,27	1,029
Library staff	10,568	9,937	9,751	9,442	0,89	0,96
Technical staff	56,425	57,257	59,385	58,096	1,03	0,97
Other staff	55,007	54,502	56,031	58,706	1,06	1,047
Nursing staff	66,526	74,694	79,158	82,402	1,23	1,041
Apprentices	15,123	19,935	22,421	23,230	1,53	1,036
Trainees/interns	1,465	1,870	2,061	2,468	1,68	1,19
Part-time employees	**4,263**	**5,924**	**5,567**	**6,002**	**1,41**	**1,078**
Other assistants	4,263	5,924	5,567	6,002	1,41	1,078
Total	**299,074**	**331,103**	**344,233**	**353,484**	**1,18**	**1,027**

Source: Based on genesis.destatis.de

TABLE 22. EXPENDITURES FOR HIGHER EDUCATION IN GERMANY BY TYPES OF HIGHER EDUCATION INSTITUTIONS FOR 2010-2021 MILLION EUR

	2010	2015	2019	2020	2021	2021/ 2010	2021, 2020
Universities	1,264	1,476	1,633	1,639	1,693	1,29	1,003
Medical universities	18,793	22,590	29,064	31,481	33,017	1,75	1,083
Colleges of Education	0,118	0,142	0,171	0,177	0,183	1,54	1,033
Colleges of technology	0,353	0,434	0,485	0,477	0,455	1,28	0,95
Colleges of arts	0,581	0,622	0,771	0,750	0,821	1,41	1,094
Colleges of applied sciences	4,289	5,926	7,131	7,508	8,033	1,87	1,069
Colleges of Public Administration	0,291	0,375	0,614	0,655	0,682	2,34	1,041
Total	41,149	50,028	61,012	64,436	67,201	1,63	1,042

Source: Based on genesis.destatis.de

In 2021, compared to 2020, spending on higher education in Germany increased by 4,2%. Medical facilities at universities are the most funded institutions – 33,017 million EUR. EUR in 2021 and universities of applied sciences – 8,033 million EUR

I. CONCLUSIONS AND PERSPECTIVES FOR FURTHER RESEARCH

The strategic priorities of the European Education Area are: ensuring inclusiveness and effectiveness of education; improving the quality of education and training; providing opportunities for lifelong learning and mobility; enhancing competences and motivation in education and professional sphere; strengthening the role and development of higher education; developing environmental «green» and digital transformations through education and training, as well as in education and training (ec.europa.eu)

Financial indicators of HEIs are determined by many factors, such as: supply and demand in the market of educational services; the network of HEIs and coverage of the target audience; tuition fees; purchasing power of the target audience. Funding of higher education institutions and a rational balance of individual and public funding are also important. When financing higher education institutions, the following methods are used: «agreed budgets»; benchmarking; «performance-based» financing; tender-based financing; contractbased financing; and the introduction of a system of vouchers and educational loans.

In the current competitive environment in the educational services market, diversification of funding sources remains a relevant tool: raising funds under international and national grant programmes; conducting research and innovative development in cooperation with business.

Threatening trends affecting demand in the market for educational services and financing of higher education institutions in general, and in Ukraine in particular, are:

– information asymmetry – the choice of an applicant's HEI and speciality based on limited information about the quality of the educational service (inability to assess the quality of the educational service in advance);

– demand-driven funding can lead to the curtailment of educational programmes that are important to society and are financially unattractive(mon.gov.ua)

The situation varies by source of funding, depending on the country. For example, in Ukraine in 2021, funding from the state and local budgets was 20/80. That is, the share of education funding in Ukraine from the state budget was 20%. At the same time, the share of education funding in Poland from the state budget was less than 0.5%. Almost all education funding in Poland is channelled through local budgets.

In many countries, private HEIs, if not directly supported through subsidies, have indirect channels of public funding, such as government student loans and tax breaks.

In general, a supply- and demand-driven system of higher education funding encourages a combination of public and private investment, which stimulates competition, innovation and efficiency

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