FINANCIAL ANALYSIS AND COMPETITIVENESS OF PUBLIC UNIVERSITIES OF SLOVAKIA IN THE CONTEXT OF FINANCIAL MANAGEMENT

Jenčová S., Vašaničová P., Štefko R., Lukáčová M.[*]

Abstract: The aim of the paper is to apply methods in the financial management of public decision-making units in the educational services industry in Slovakia that is represented as NACE Rev. 2 85.42.0 - Tertiary education. The paper provides a closer look at the funding of public universities in Slovakia from 1989 to the present. The idea is to deal with the position of public universities and the development of the entire tertiary education. Attention is paid to financial and non-financial indicators of the tertiary education sector, retrospective financial analysis of public universities in Slovakia and their competitiveness. Results of such or similar analyzes with a focus on the public higher education sector are absent. The results show that the funding of public universities in Slovakia is at a low level compared to selected EU countries. The Technical University of Kosice, Pavol Jozef Safarik University in Kosice, and Comenius University in Bratislava represent the ranking of the best decision-making units of the tertiary education system at the national level. Universities in Slovakia must adapt to the needs of the future; otherwise, a large group of the unemployed will increase in a few years. Cooperation between universities and businesses at national and international level is important, all on the issue of paying attention to the goals of sustainable development.

Key words: sector, financial metrics, funding, public university, educational services, financial analysis.

DOI: 10.17512/pjms.2021.24.2.10

Article history:
Received August 16, 2021; *Revised* September 20, 2021*; Accepted* October 03, 2021

Introduction

The present represents a multidimensional and ambiguous period when the process of social transformation penetrates every area. The changing world of economics, politics, social structures, value orientations, globalization, automation, or digitization accelerates the development of world science, contacts and increases the ability to compete. Educational services as an open system have a defined environment that determines what happens at school and directly enters school life. Their operation is affected by political, demographic, social, cultural, competitive,

---

[*] **Sylvia Jenčová** Assoc. Prof. Ing., PhD., **Petra Vašaničová** PhDr., PhD., **Marta Lukáčová** Mgr., Department of Finance, Accounting and Mathematical Methods, University of Prešov, Faculty of Management, **Róbert Štefko** Prof. Ing.**,** PhD. Department of Marketing and International Trade, University Prešov, Faculty of Management**.**
✉ corresponding author: sylvia.jencova@unipo.sk;
✉ sylvia.jencova@unipo.sk; petra.vasanicova@unipo.sk; robert.stefko@unipo.sk; marta.lukacova@smail.unipo.sk

POLISH JOURNAL OF MANAGEMENT STUDIES
Jenčová S., Vašaničová P., Štefko R., Lukáčová M.

2021
Vol.24 No.2

and other influences, to which they must respond adequately and have an appropriate capacity to adapt.

In 2018, the Presidents of the Rectors' Conferences of the Czech Republic, Poland, Slovakia, Slovenia, Croatia, Serbia, Austria, Germany, Switzerland and Italy signed a joint declaration University for enlightenment (U4E). The aim was to establish a platform to develop the principles of academic freedom and integrity of research and teaching, institutional autonomy, participatory management of universities and public responsibility for higher education. In June 2019, the Global Forum on Academic Freedom, Institutional Autonomy and the Future of Democracy was held at Council of Europe headquarters in Strasbourg. A declaration was adopted in which, among other things, they recommended to universities and their management "to raise awareness among members of the academic community of the importance of academic freedom and institutional autonomy as well as the crucial role of higher education to democracy" and "to explore the role and meaning of academic freedom and institutional autonomy within their respective institutions and systems, and the steps needed to protect these in an increasingly polarized and divided public sphere" (Global Forum, 2019; Vlasov et al., 2020).

According to the analysis of the OECD indicators from the Education at a Glance 2019 publication (see OECD, 2019) and their comparisons from an international and gender perspective, Filčák (2019) and Filčák (2020) present the main findings:

-In most OECD countries, those with a bachelor's or equivalent degree account for the largest share of tertiary-educated people; in Slovakia, those with a master's or equivalent degree account for the largest share of adults with tertiary education.

-The share of younger adults with tertiary education has increased between 2008 and 2018, while this trend is more characteristic for women than for men.

-In almost all OECD countries, the proportion of tertiary-educated women is higher than the proportion of tertiary-educated men.

-Adults with a tertiary qualification are better placed on the labor market than adults with an upper secondary or post-secondary non-tertiary qualification.

-Despite being, on average, more highly educated as a group than young men, young women at all levels of educational attainment have lower employment rates.

-In Slovakia, the unemployment rate for 25–34-year-olds with an upper secondary or post-secondary nontertiary education is slightly lower than an average across OECD countries. Compared to neighboring countries, the long-term unemployment rates for adults with below upper secondary education are highest in Slovakia.

-In Slovakia, expenditure per student does not reach the OECD average; this is also the case in other neighboring countries, except for Austria.

Universities face many challenges in various fields daily. It is important to quickly identify and prevent the emerging causes of instability. Therefore, it is important to assess the financial health of higher education institutions (Abdimomynova et al., 2021, Dabylova et al. 2020). This paper deals with the funding of public universities in Slovakia from 1989 to the present. The paper aims to apply methods in the financial management of public decision-making units in the educational services

2021
Vol.24 No.2

POLISH JOURNAL OF MANAGEMENT STUDIES
Jenčová S., Vašaničová P., Štefko R., Lukáčová M.

industry in Slovakia that is represented as SK NACE Rev. 2 85.42.0 - Tertiary education. The partial aim is to assess the competitiveness of the Slovak public universities.

Literature Review

As Mahdi et al. (2019) stated, universities are facing new financial and non-financial challenges. Similar ideas were presented in a study conducted by Kubak et al. (2019); Lincényi and Laczko (2020); Cibák et al. (2021), Stanowicka, (2021). Currently, it is the COVID-19 pandemic, which has greatly affected life at universities (Gavurova et al., 2020). Rehák (2019), Hanová et al. (2016) and Menshikov et al. (2021) analyze the relationship between universities and regional development. Gurňák et al. (2009, 2012) examined the spatiotemporal aspects of the universities' location in Slovakia in a broader context, from which they drew conclusions. The low qualification level in the south and east of Slovakia generates future poverty of people. The solution is to place universities in the east of the country. However, the problem is that it takes decades to build such an educational institution without a real historical or cultural background. For instance, in the case of the Technical University of Kosice, it took some time to gain a reputation, a hallmark of skills, contacts, and reach the current level. Hanová et al. (2016) distinguish between the so-called transaction services and transformation activities. Transaction services are the activities of a university, which represent its usual activities, not funded from regional sources (e.g., a subsidy from the state budget). The field of education is examined from several perspectives. For example, the study of Horňák et al. (2014) deals with university management, the process model of school management, and project-oriented school management. Eger et al. (2002) examine school quality, which is defined as the optimal level of its operation in terms of fulfilling the individual functions of the school in relation to the achieved educational results and long-term effects. Fedorko (2017) describes specific aspects of the online communication process from the perspective of tertiary education institutions and applicants. Bačík (2007) deals with the marketing orientation of a tertiary education organization.

University competitiveness is also an important topic in the field of higher education, which is becoming more and more intense (Amirkhanova et al., 2017; Girdzijauskaite et al., 2019; Navickas et al., 2021) because higher education institutions compete for students, teachers, funds, and reputation in general (Hopbach, 2012). Unfortunately, increased competition among universities causes cooperation problems (Muscio et al., 2013). Amirkhanova et al. (2017) studied the impact of image on university competitiveness. The research of Stimac and Simic (2012) emphasizes that marketing orientation and service quality can improve competitive ability in higher education. Petruk (2018) states that the internationalization of higher education can increase university competitiveness; Dachyar and Dewi (2015) point to the importance of the management information system in this area. Cretan and Gherghina (2015) find out that competitiveness is strongly related to the performance of each university, while they emphasize the

POLISH JOURNAL OF MANAGEMENT STUDIES
Jenčová S., Vašaničová P., Štefko R., Lukáčová M.

**2021
Vol.24 No.2**

importance of funding as a driving force to competitiveness. Previous studies also dealt with the financial performance of higher education institutions (Burgstahler and Sawers, 2017; Mathenge and Muturi, 2017; El Talla et al., 2018; Kaur, Singh, 2020). Among other things, this paper studies university competitiveness concerning their basic financial indicators. Funding across universities is also an important research topic, as evidenced by the enormous number of publications (Muscio et al., 2013; Wu, 2015; Bolli et al., 2016; Wu et al., 2018; Mhamed et al., 2021). Each of the mention papers deals with the funding of higher education institutions in a specific country, while the processes of public competition should also be taken into account (Tkacova et al., 2017; Ulewicz and Sethanan 2020). This paper supplements this research area with funding of universities in Slovakia.

After the fall of communism in 1989, public universities (PUU), state universities (STU), private universities (PRU) and foreign universities (FOU) were established in Slovakia. Table 1 shows the establishment of universities operating in Slovakia.

Table 1. Establishment of universities in Slovakia at the NUTS III level and their form; for analysed public universities; website and used abbreviation

Bratislava Region (11)	Date of establishment
Bratislava International School of Liberal Arts - BISLA (PRU)	1.7.2006
Pan-European University (PRU)	14.7.2004
School of Economics and Management of Public Administration in Bratislava (PRU)	10.4.2004
St. Elizabeth University of Health and Social Sciences (PRU)	24.9.2003
Academy of the Police Force in Bratislava (STU)	1.10.1992
Slovak Medical University in Bratislava (STU)	1.9.2002
Comenius University in Bratislava (PUU) (www.uniba.sk) (CU)	27.6.1919
Slovak University of Technology in Bratislava (PUU) (www.stuba.sk) (STU)	25.6.1937
University of Economics in Bratislava (PUU) (www.euba.sk) (UE)	1.10.1940
Academy of Performing Arts in Bratislava (PUU) (www.vsmu.sk) (APA)	9.6.1949
Academy of Fine Arts and Design in Bratislava (PUU) (www.vsvu.sk) (AFAD)	9.6.1949
Trnava Region (4)	
University of Central Europe in Skalica (PRU)	30.11.2005
Danubius University (PRU)	30.5.2005
University of Ss. Cyril and Methodius in Trnava (PUU) (www.ucm.sk) (UCM)	27.7.1997
Trnava University in Trnava (PUU) (www.truni.sk) (TUT)	1.7.1992
Trenčín Region (3)	

2021
Vol.24 No.2

POLISH JOURNAL OF MANAGEMENT STUDIES
Jenčová S., Vašaničová P., Štefko R., Lukáčová M.

DTI University (PRU)	1.3.2006
School of Management (PRU)	1.12.1999
Alexander Dubcek University of Trencin (PUU) (www.tnuni.sk) (ADU)	1.7.1997
Nitra Region (3)	
Constantine the Philospher University in Nitra (PUU) (www.ukf.sk) (CPU)	31.7.1959
Slovak University of Agriculture in Nitra (PUU) (www.uniag.sk) (SUA)	1.9.1952
J. Selye University (PUU) (www.ujs.sk) (JSU)	1.1.2004
Žilina Region (3)	
Armed Forces Academy of General Milan Rastislav Štefánik (STU)	1.9.1973
University of Zilina (PUU) (www.uniza.sk) (UZ)	1.10.1953
Catholic University in Ruzomberok (PUU) (www.ku.sk) (CUR)	1.7.2000
Banská Bystrica Region (4)	
Ján Albrecht Music and Art Academy Banská Štiavnica (PRU)	19.1.2011
Matej Bel University (PUU) (www.umb.sk) (MBU)	1.7.1992
Technical University in Zvolen (PUU) (www.tuzvo.sk) (TUZ)	25.4.1946
Academy of Arts in Banska Bystrica (PUU) (www.aku.sk) (AA)	1.7.1997
Prešov Region (2)	
Collage of International Bussines ISM Slovakia (PRU)	24.8.2005
University of Prešov (PUU) (www.unipo.sk) (UP)	1.1.1997
Košice Region (4)	
University of Security Management in Košice (PRU)	7.6.2006
Technical University of Kosice (PUU) (www.tuke.sk) (TUK)	8.7.1952
Pavol Jozef Safarik University in Kosice (PUU) (www.upjs.sk) (PJSU)	1.1.1959
University of Veterinary Medicine and Pharmacy in Kosice (PUU) (www.uvlf.sk) (UVMP)	16.12.1949

Source: own processing

Subsequently, in 1999, a credit system and a three-level university degree were introduced. This reform, known as the Bologna Follow-Up Group, aims to create a European university under common principles. European University Association (EUA), a representative organization of universities and national rectors' conferences of 48 European countries, plays a cardinal role in the Bologna Follow-Up Group and influences EU policies in higher education, research, and innovation (EUA, 2020).

POLISH JOURNAL OF MANAGEMENT STUDIES
Jenčová S., Vašaničová P., Štefko R., Lukáčová M.

**2021
Vol.24 No.2**

Data and Methodology

Within the analysis of tertiary education, this paper deals with public universities in Slovakia (see Table 1 – PUU). Data entering the analysis were obtained from the Ministry of Education, Science, Research and Sport of the Slovak Republic (MESRS SR), from the DATAcube database of the Statistical Office of the Slovak Republic, from the Register of Financial Statements of the Slovak Republic, STATdat, Slovstat, Statistical Office of the Czech Republic, ETER database.

So far, many definitions and models of competitiveness have been proposed (Kruk and Wasniewska, 2017). Mikoláš et al. (2011) assess the competitiveness of decision-making units in the selected sector according to several competitiveness coefficients; e.g., the position of the i-th ($i = 1, 2, ..., n$) unit, in the set of units of the industry concerning the concentration of sales (S), is determined by the competitiveness coefficient ($c_{s,i}$) given by the following formula:

$$c_{S,i} = \frac{\Delta \ln(S_i) - \Delta \ln(S_{min})}{\Delta \ln(S_{max}) - \Delta \ln(S_{min})}$$

In this paper, a well-known regression analysis is used to quantify the relationship of volume of sales (S) with personal costs (PC) and assets (A) (Lee, 2016). The regression model with constant β_0 and regression coefficients β_1 and β_2 is

$$\ln(S) = \beta_0 + \beta_1 \cdot \ln(PC) + \beta_2 \cdot \ln(A)$$

Then, it is evaluated the quality of the model using various tests, considering the significance level $\alpha = 0.05$ (specifically, the normality of residuals, multicollinearity, and homoskedasticity).

Next, based on the available data from 1989 to 2020, it is calculated financial indicators, statistical indicators, basic indices (BI), chain indices, growth rate (GR) and geometric mean (G), according to the formulas from Jenčová (2018).

An indicator of financial analysis is usually numerical information quantifying the economic phenomenon. The quantified indicator describes some static or dynamic reality. It depends on whether it quantifies the values of indicators; or also monitors their development over time; or after being influenced by other factors. Each indicator is characterized by name, content, calculation method, quantitative characteristics, and temporal and spatial definition. Indicators are calculated in units of measurement in natural, labor, cash, time, specific, or dimensionless. Due to the different structures of assets and liabilities, the affiliation of the decision-making unit to some sector or industry also significantly affects the mentioned indicators.

Retrospective financial analysis; in other words, ex-post direct analysis of intensive indicators or ratio analysis provides an insight into the financial situation of the company in the past. Financial metrics are constructed by the ratio of one or more accounting items to another accounting item or items. This analysis is based on past data on the business entity, i.e., it is about performing an analysis of basic ratios of liquidity, activity, indebtedness, profitability and market value. The financial situation can be understood as a complex multi-criteria model consisting of several sub-components, characteristics and links. At present, many authors deal with the

2021
Vol.24 No.2

POLISH JOURNAL OF MANAGEMENT STUDIES
Jenčová S., Vašaničová P., Štefko R., Lukáčová M.

theory of model decomposition. The most important authors are Vasiu et al. (2012), Rudrajeet and Aneja (2017), Mokrišová, Horváthová (2020), Carvalho et al. (2017), Mihola and Kotesovcova (2015), Vitkova and Semenova (2015), Lubinski et al. (2013), Cheng and Tang (2010), Herciu et al. (2011), Horobet et al. (2011), Kyaw and Theingi (2009) and Zhang et al. (2016).

Table 2 lists the most used ratios. The formula is determined based on the financial statements for non-profit organizations with the legal form of a public institution.

Table 2. Basic Financial Ratios

Formula	Calculation	Desired trend
$CaR = \dfrac{CR}{CL}$	r. 51 (r. 052 to r. 056)/r. 87 (r. 088 to r. 096)	<0,2 – 0,8>
$QR = \dfrac{(CE + AR)}{CL}$	r. 55 + r. 42 (r. 043 to r. 050)/r. 87 (r. 088 to r. 096)	<1,2 – 1,5>
$CuR = \dfrac{CA}{CL}$	r. 29 (r. 030 + r. 037 + r. 042 + r. 051)/r. 87 (r.088 to r.096)	<2,0 – 2,5>
$TDTAR = \dfrac{TD}{TA}$	r.30 r. 031 to r. 036 r. 074 (r. 075 + r.079 + r.087 + r.097)/r. 60 (r. 001 + r. 029 + r. 057)	decrease
$ICR = \dfrac{EBIT}{IE}$	r. 75 + (r. 74 – r. 38)/r. 19	increase
$FL = \dfrac{TA}{E}$	r. 60 (r. 001 + r. 029 + r. 057)/r.61 (r. 062 + r. 068 + r. 072 + r. 073)	decrease
$AT = \dfrac{S}{TA}$	(r. 39 + r. 40 + r. 41 + r. 59 + r. 61)/r. 60 (r. 001 + r. 029 + r. 057)	increase
$IT = \dfrac{I}{S} \cdot 365$	r. 30 (r. 031 to r. 036)/(r. 39 + r.40 + r. 41 + r. 59 + r. 61)	decrease
$ARTR = \dfrac{AR}{S} \cdot 365$	r. 37 + r. 42/(r. 39 + r. 40 + r. 41 + r. 59 + r. 61)	decrease
$LRR = \dfrac{LC}{R}$	r. 8/r.74	decrease
$TBR = \dfrac{EAT}{EBT}$	r. 61/r.56	increase
$ROA = \dfrac{EBIT}{TA}$	r. 75 + (r. 74 – r. 38)/r. 60 (r. 001 + r. 029 + r. 057)	increase
$ROE = \dfrac{EAT}{E}$	r. 78 (r. 75 - (r. 76 + r. 77)) (+/-)/r. 61 (r. 062 + r. 068 + r. 072 + r. 073)	increase
$ROS = \dfrac{EBIT}{S}$	r. 75 + (r. 74 – r. 38)/ (r. 39 + r. 40 + r. 41 + r. 59 + r. 61)	increase

Source: own processing

Note: The above abbreviations denote the following: AR – Accounts Receivables, ARTR – Accounts Receivables Turnover Ratio, AT – Assets Turnover, CA – Current Assets, CaR – Cash Ratio, CE – Cash & Equivalents, CL – Current Liabilities, CuR – Current Ratio, E –

Equity, EAT – Earnings after Taxes, EBIT – Earnings before Interest and Taxes, FL – Financial Leverage, I – Inventory, ICR – Interest Coverage Ratio, IE – Interest Expenses, IT – Inventory Turnover, LC – Labor Costs, LRR – Labor to Revenue Ratio, QR – Quick Ratio, R – Revenues, ROA – Return on Assets, ROE – Return on Equity, ROS – Return on Sales, S – Sales, TA – Total Assets, TD – Total Debt, TDTAR – Total Debt to Total Assets Ratio; r. denotes row number of the Financial statement of the nonfinancial accounting entity.
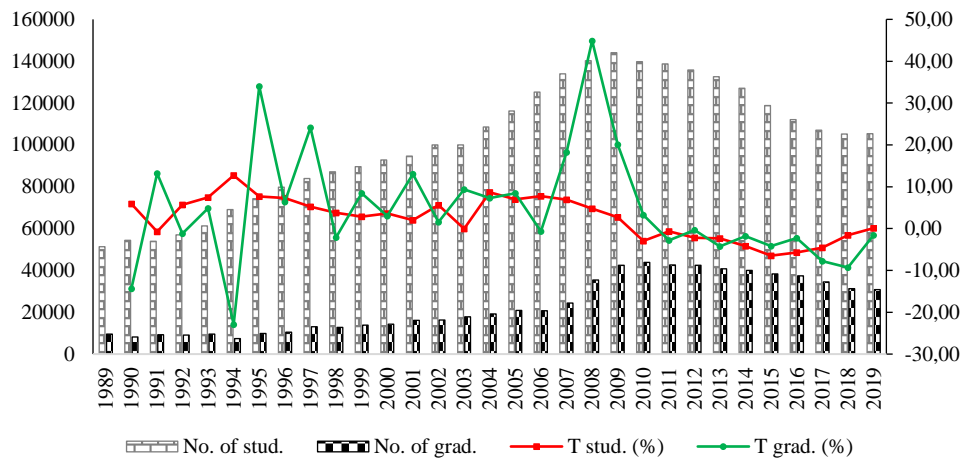
Results of State Analysis and Funding of Public Universities of Slovakia

Public higher education institutions are autonomous, self-governing, and are managed by self-governing authorities under the internal regulations of the higher education institution. The funding of public higher education institutions is regulated by the Act on higher education. According to this Act, the public higher education institution is a statutory and self-governing institution that is funded primarily through subsidies from the state budget or other resources (i.e., business environment). Based on the mentioned databases resources and realized financial analysis, this study shows the following results.

In the educational services area of higher education, in 2016, the Slovak Republic spent $11,413 per capita; the average of OECD countries was $15,556. There are no significant differences among the V4 countries, but Poland spent the least on higher education, while expenditure per capita was $8,977. Austria spent $18,332 per capita.

After the fall of communism, 64,442 students were registered at universities. The growth rate shows that the number of students increased until 2009. It began to decline to 134,953 people in 2019, from which 115,366 students were registered at public universities, 15,717 students were at private universities, and 3,870 students were at state universities. In 2019 compared to 1989, the growth rate was 79%. Compared to 2009, it is a negative decrease of –38.5%. The number of live births exceeded the number of students until 1993, followed by a decrease from 73,218 live births to 50,804 live births in 2002 and 57,054 in 2019. In 2019 compared to 1989, the number of students doubled, and almost quadrupled, in 2009 compared to 1989.

2021
Vol.24 No.2

POLISH JOURNAL OF MANAGEMENT STUDIES
Jenčová S., Vašaničová P., Štefko R., Lukáčová M.

Figure 1: Development of the Number of Students and Graduates of Universities in Slovakia (Full-Time Study)
Source: own processing based on the data from the Statistical Office of the Slovak Republic.
Note: The above abbreviations denote the following: No. of stud. – Number of students of full-time study, No. of grad. – Number of graduates of full-time study, T stud. – Trend of students, T. grad. – Trend of graduates.

A chronic problem in higher education is brain drain. Most Slovak students go to universities in the neighboring Czech Republic. Table 3 shows the number of Slovak students at Czech universities by field groups for every form of study. The green cells in Table 3 show the years in which most Slovak students tended to a particular field. It is no longer interesting that throughout history, the number has increased in the medical field, especially in the field of general medicine. The greatest interest (blue cell) is in the study of medicine, economics, information technology, law and the arts professions. At present, almost 21,000 Slovaks study at Czech universities. According to Table 3, the average geometric growth rate was $G = 16.67\%$ until 2011 and fell to 8% until 2019.

POLISH JOURNAL OF MANAGEMENT STUDIES
Jenčová S., Vašaničová P., Štefko R., Lukáčová M.

2021
Vol.24 No.2

Table 3. Development of the Number of Slovak Students at Czech Universities

	ICT	Business, administration and law	Natural sciences, mathematics and statistics	Social sciences, journalism and information sciences	Technology, production and construction	Arts and humanities	Education and training	Health and social care, care for favorable living conditions	Agriculture, forestry, fishing and veterinary	Total
2001	302	1279	405	400	831	490	107	1168	180	5162
2002	518	1703	551	582	1031	617	262	1523	200	6987
2003	605	2143	576	778	1209	748	550	1644	216	8469
2004	910	3157	740	1008	1676	872	954	1946	307	11570
2005	1200	4359	839	1249	1972	1055	1106	2234	371	14385
2006	1498	5176	902	1418	2007	1161	1132	2384	385	16063
2007	1778	5993	1015	1531	2193	1328	1248	2368	415	17869
2008	2087	6714	1133	1658	2294	1517	1419	2317	432	19571
2009	2302	7653	1225	2050	2403	1787	1583	2474	451	21928
2010	2592	7852	1450	2457	2671	2059	1819	2581	449	23930
2011	2742	7585	1520	2705	2763	2185	1327	2782	477	24086
2012	2906	6658	1630	2801	3060	2280	772	2968	490	23565
2013	2908	5683	1747	2733	3225	2364	587	3193	497	22937
2014	3026	4514	1836	2616	3352	2390	498	3389	545	22166
2015	3086	3899	1914	2379	3462	2337	430	3622	584	21713
2016	3117	3654	1911	2242	3500	2304	436	3848	602	21614
2017	3096	3443	1853	2112	3393	2286	444	3718	610	20955
2018	3201	3311	1896	2033	3337	2180	440	3735	633	20766
2019	3211	3247	1942	1955	3231	2153	443	3848	612	20642
G_{01-11}	1.247	1.195	1.141	1.211	1.128	1.161	1.286	1.091	1.102	1.167
G_{12-19}	1.020	0.899	1.031	0.960	1.020	0.998	0.872	1.041	1.032	0.981
G_{01-19}	1.140	1.053	1.091	1.092	1.078	1.086	1.082	1.068	1.070	1.080

Source: own processing

For comparison, in the Czech Republic, a total of 288,915 people study on all forms of study and types of study programs, with 55.8% are women and 16.1% (46,441 people) are foreigners. The Czech Republic currently has 60 universities, of which

26 are public schools, at which a total of 261,269 students study. In 2019, the fewest students studied at Czech universities since 2004.

Figure 2 illustrates the development of the number of applicants from the Czech Republic, Ukraine, and foreign nationals in total to Slovak universities.
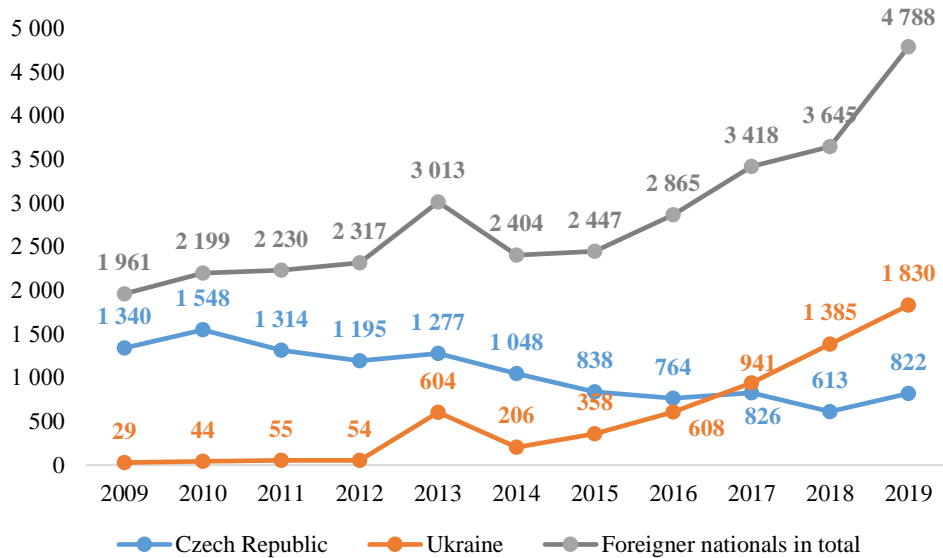
Figure 2: Development of the Number of Enrollments of Foreigners at the Universities in Slovakia
Source: own processing

The funding of public higher education institutions is provided by Act No. 131/2002 on higher education and the change and supplement to some acts, which regulates the budget, financial funds, assets and economy of public higher education institutions. Financial support (subsidy) for higher education institutions is determined by "The methodology of distribution of state budget subsidies to public higher education institutions" (www.minedu.sk). The methodology and distribution are based on Act no. 425/2020 on the state budget for the relevant year.

In 2019, the share of expenditures of the MESRS SR in state budget expenditures was 7.19%; in 2020, there was a negative decrease to 5.67%. Since 2010, the share of the MESRS SR expenditures in GDP has been declining every year (in 2010, it was 3.45%). At present, this share represents 1.45% of GDP. In 2019, the share of subsidies for higher education (EUR 502.26 million) in GDP (EUR 93,865.2 million) was 0.55%. Since 2003 (0.67%), it has not changed significantly. Figure 3 shows the development of revenue and expenditure from 2007 to 2021 and for the following years (2022 and 2023). The growth rate shows a variable running, with the highest negative decline expected in 2023 (since 2016). The financial structure of universities amounted to EUR 1,448,973,287 thousand, while own resources accounted for 49.55%, external sources 5.57% and deferred revenue 44.87%.

Buildings accounted for 56.07% of the property structure (which is the most); financial accounts that are a part of current assets accounted for 22.98%.

The share of total public expenditure on higher education in GDP is more than half a percent. The largest share was recorded in 2009, which was probably related to the election year. According to the development of 2003 - 2021, for accredited study programs, the average annual growth rate is expressed by the geometric mean is G = 2.18%, for research and artistic activity $G = 12.71\%$, for social support of students $G = 4.93\%$ and for university development $G = 3.95\%$. In 2023, the development of the total subsidy for universities should decrease by 12.5% compared to 2020; and by 9.16% compared to 2021. The average annual growth rate of the total subsidy is $G = 3.35\%$.
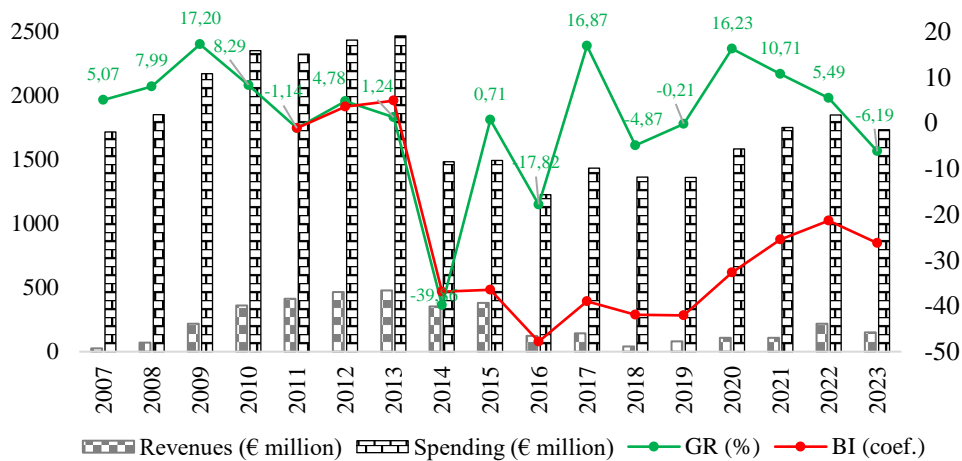

Figure 3: Funding of Universities
Source: own processing based on the data of the MŠVVaŠ

Compared to the history of 20 years (2003 - 2023), the increase in the subsidy is only 93.6%. Considering the period 2012-2015, the growth of total public expenditure on universities was 1.18%. For comparison, according to the EUA, in this period, the growth of these expenditures was 19.5% in Iceland, 14.6% in Portugal, 15% in Belgium, 7.9% in Sweden, 3.7% in Hungary and 4.1% in the Czech Republic. During this period, the decrease was recorded in Ireland (–20.1%) and Ukraine (–14.6%).

Over the last decade, the state of funding and support for research and innovation in Slovakia hardly changed. The long-term burden of Slovak science is chronic underfunding. In 2019, expenditures on research and development were 0.83% of GDP, which means that the Slovak Republic lags significantly behind the EU average (1.65% of GDP) in the given period, and it is close to meeting the 1.2% target set for 2020 in the RIS3 SK strategy. According to the international comparison with EU countries, in 2019, the total expenditure (% of GDP) on research and development reached 0.83%, while behind the Slovak Republic were

2021
Vol.24 No.2

POLISH JOURNAL OF MANAGEMENT STUDIES
Jenčová S., Vašaničová P., Štefko R., Lukáčová M.

only Bulgaria, Malta, Cyprus, Romania and Latvia. The average of EU countries was 1.65%. Among the V4 countries, the Czech Republic (1.94%), Hungary (1.48%) and Poland (1.32%) spend the most. Sweden, Germany, Austria, Denmark, Belgium and Finland spend the highest percentage.

Slovakia has one of the lowest numbers of patents per capita (behind Slovakia is Croatia, Bulgaria, Cyprus, and Lithuania). Slovakia also lags in producing scientific publications per population, while Slovak researchers have almost half the performance compared to the EU average. Slovakia is even more significantly behind in the number of citations of scientific publications per population (behind Slovakia is Poland, Latvia and Bulgaria). Analysts of the initiative "It Makes Sense" state that two-thirds of the 149 scientific councils, according to the resulting study, record deeply below-average scientific results (Vančíková, 2019). Compared to world universities, Slovakia has low research efficiency.

Results of Financial Analysis of Public Universities of Slovakia

The following financial analysis of public universities in Slovakia is performed using data from the financial statements available in the Register of Financial Statements of the Slovak Republic for 2012-2019.

Table 4 shows the development of the median of the financial ratios in the section of higher education (SK NACE Rev. 2 854). The orange cell color indicates the negative state of the ratios. The industry profitability had a variable tendency; the median of the return on assets (*ROA*) ratios reached a negative value in 2015 and 2019. On the contrary, the highest return on assets was 37.75% in 2009 and 18.54% in 2018. Return on sales (*ROS*) reached almost 29% in 2018, followed by an undesirable decline. Added value to sales ratio (*AV/S*) reached 45.97%. Indebtedness analysis shows that the median of total debt to total assets ratio (*TDTAR*) for the entire sector is 58.95%. It accounts for 60 cents of liabilities per one euro of equity (*E/L*).

According to the Act No. 131/2002 on higher education, a public higher education institution may accept a loan only if the total amount of the debt of the public higher education institution does not exceed 60% of the actual revenue of the previous financial year without revenue from subsidies from the state budget. Moreover, the amount of annual loan repayments, including the repayment of revenues, does not exceed 25% of the actual revenue of the previous financial year, excluding revenue from subsidies from the state budget. It is not possible to use funds from subsidies from the state budget for loan repayments, including the payment of income.

In 2015, 2016, 2017 and 2019, the current ratio (*CuR*) was not in the range of recommended values (orange cell in Table 4). For the industry SK NACE 854, Table 4 shows the development of mean values of activity ratios. Specifically, it reveals accounts receivables turnover ratio (*ACTR*), accounts payable turnover ratio (*APTR*), trade payable turnover ratio (*TPTR*) and trade receivables turnover ratio (*TRTR*). The analysis of activity indicators generally points to a favorable financial situation within the whole sector. It caused the efficiency of the process of public universities

POLISH JOURNAL OF MANAGEMENT STUDIES
Jenčová S., Vašaničová P., Štefko R., Lukáčová M.

2021
Vol.24 No.2

to be directly reflected in the profit and the return on assets of the decision-making unit. On the other hand, it is necessary to continue to monitor the trade receivables turnover ratio because the median in the section reached a positive decrease from 24.59 days in 2018 to 18.88 days in 2019. On the contrary, universities pay their debts before (15.49 days) they collect.

Table 4. Development of the Median of the Financial Ratios of SK NACE Rev. 2 854

Metrics	2007	2008	2009	2010	2011	2012	2013	2015	2016	2017	2018	2019
QR, CuR (coef.)	1.56	1.56	2.44	2.30	1.86	1.35	4.03	0.64	0.58	0.99	1.57	0.76
ACTR(days)	15.32	42.35	158.06	102.75	34.15	51.52	75.06	67.42	54.88	39.75	48.23	38.21
TPTR (days)	6.47	8.32	3.79	16.81	5.73	12.84	22.16	9.23	5.06	9.70	24.59	18.88
APTR (days)	65.50	88.29	64.97	95.04	89.64	112.87	68.13	183.61	133.19	75.69	92.13	60.70
TRTR (days)	14.26	5.99	11.29	7.25	13.28	7.15	28.57	18.85	6.74	14.57	12.13	15.49
AT (coef.)	1.73	1.19	0.95	0.86	0.78	1.58	1.45	1.14	0.89	1.48	1.40	0.95
TDTAR (%)	64.07	64.07	45.83	40.40	41.80	43.30	48.08	71.79	62.25	62.95	60.03	58.95
E/L (coef.)	-	-	-	2.49	1.61	1.31	3.10	0.67	1.16	0.91	1.34	0.80
ROE (%)	1.36	11.65	43.04	5.13	11.18	0.59	5.82	-7.69	16.46	34.15	41.93	-6.68
ROA (%)	1.14	5.36	37.75	2.83	5.98	0.58	3.09	-3.64	5.41	9.30	18.54	-5.97
ROS (%)	0.81	7.18	39.62	4.20	5.76	0.39	3.16	-1.94	6.26	6.30	29.06	-6.51
AV/S	56.68	61.78	78.68	60.54	48.22	28.99	23.82	54.34	31.89	54.29	50.45	45.97
EBITDA/S	7.55	12.91	41.77	16.02	27.50	0.85	4.29	-2.63	4.27	6.30	28.81	5.71

Source: own processing based on the data from Slovak Credit Bureau 2007–2020
Note: The above abbreviations denote following: AT – Assets Turnover; AV – Added Value; ACTR – Accounts Receivables Turnover Ratio; APTR – Accounts Payable Turnover Ratio; CuR – Current Ratio; E – Equity; EBITDA – Earnings before Interest, Taxes, Depreciation and Amortization; L – Liabilities; ROA – Return on Assets; ROE – Return on Equity; ROS – Return on Sales; S – Sales; TDTAR – Total Debt to Total Assets Ratio; TPTR – Trade Payable Turnover Ratio; TRTR – Trade Receivables Turnover Ratio.

Results of the retrospective financial analysis for individual universities using indicators of productivity (*ROA* – Return on Assets), activity (*LRR* – Labor to Revenue Ratio) and tax burden ratio (*TBR = EAT / EBT*) are presented in Table 5. It was used the absolute values from the financial statement of each university.

2021
Vol.24 No.2

POLISH JOURNAL OF MANAGEMENT STUDIES
Jenčová S., Vašaničová P., Štefko R., Lukáčová M.

Table 5. Financial Ratios of Analyzed Universities

University	ROA			TBR			LRR		
	2017	**2018**	**2019**	**2017**	**2018**	**2019**	**2017**	**2018**	**2019**
CU	0.012	0.006	0.019	0.979	0.957	0.987	0.407	0.426	0.609
SUT	0.002	0.003	0.000	0.622	0.704	0.211	0.381	0.388	0.570
TUK	0.011	0.014	0.070	0.877	0.836	0.977	0.400	0.405	0.554
UP	0.000	0.000	0.003	0.816	0.864	0.983	0.446	0.478	0.674
UZ	0.014	0.001	0.001	0.939	1.000	1.000	0.325	0.346	0.506
UE	0.004	0.015	0.001	0.927	0.973	0.714	0.459	0.454	0.680
PJSU	0.034	0.027	0.018	0.977	0.993	0.984	0.386	0.411	0.605
CPU	0.016	0.016	0.011	0.989	0.983	0.979	0.471	0.468	0.682
MBU	-0.007	-0.003	0.005	1.085	1.256	0.921	0.442	0.456	0.656
SUA	0.003	0.001	0.002	0.885	0.757	0.805	0.427	0.431	0.635
UCM	0.001	0.007	0.012	0.886	0.961	0.973	0.474	0.460	0.655
TUT	0.008	0.002	0.002	0.973	0.910	0.945	0.489	0.488	0.688
CUR	0.000	0.019	-0.002	-6.731	0.975	-1.383	0.467	0.451	0.675
APA	0.033	0.048	0.022	0.984	0.986	0.977	0.466	0.442	0.481
ADU	-0.022	-0.005	0.094	1.000	1.002	1.000	0.352	0.351	0.425
TUZ	0.014	0.013	0.012	0.799	0.879	0.930	0.369	0.362	0.560
UVMP	0.003	0.000	0.000	0.778	0.002	0.148	0.363	0.374	0.569
JSU	0.000	0.001	0.002	0.856	0.991	0.996	0.399	0.337	0.564
AFAD	0.007	0.016	0.004	0.817	0.949	0.724	0.438	0.446	0.668
AA	-0.002	0.006	0.013	1.415	0.963	0.996	0.558	0.541	0.763

Source: own processing

Resulting Competitiveness Model of Public Universities of Slovakia

This section focuses on assessing the competitiveness of public universities in Slovakia. The linear regression model with logarithmic transformations is composed by using financial items of sales (S), personnel costs (PC) and assets (A), while dependent and independent variables are ln-transformed. Using data from 2019, the estimated regression model is:

$$\ln(S) = 0.778 + 0.221 \cdot \ln(PC) + 0.718 \cdot \ln(A)$$

For any 1% increase in personnel costs, while the assets at fixed value were held, about 0.221% increase in the volume of sales is expected. For any 1% increase in assets, while the personnel costs at fixed value were held, it is expected about 0.718% increases in the volume of sales. All coefficients are statistically significant ($p = 0.0000$).

After evaluating the assumptions for using the model by the normality test, the normality of the residuals was confirmed. Because the variance inflation factor ($VIF = 3.656$) was smaller than 10, there is no problem with multicollinearity. The White test ($p = 0.357$) and Breusch-Pagan test ($p = 0.932$) were used to confirm the homoscedasticity. The model is statistically significant at $\alpha = 0.05$ significance level.

POLISH JOURNAL OF MANAGEMENT STUDIES
Jenčová S., Vašaničová P., Štefko R., Lukáčová M.

2021
Vol.24 No.2

Results Discussion

According to Table 5, in 2019, Labor to Revenue Ratio is moving from 42.5%, for ADU, to 76.3%, for AA. CUR shows a negative *ROA* value, while the highest value is for TUK (*ROA* = 0.07). CUR also shows a negative value of TBR, representing the impact of state tax policy on profitability. Earnings after taxes to Earnings before taxes Ratio is less than one in almost all public universities.

Considering the results of the competitiveness coefficient ($c_{s,i}$) for 2019, the most competitive universities are the following: TUK ($c_{s,i} = 1$), UCM ($c_{s,i} = 0.9$), ADU ($c_{s,i} = 0.8$), UP ($c_{s,i} = 0.77$), CU ($c_{s,i} = 0.76$) and PJSU ($c_{s,i} = 0.63$). The less competitive universities are: CUR ($c_{s,i} = 0.21$), UE ($c_{s,i} = 0.21$) and AA ($c_{s,i} = 0.0$).

Less funding threatens the competitiveness of universities. Primarily, the right decisions of managers, i.e., their strategies and tactics, will always have the main impact on competitiveness. The quality of these decisions will be a major determinant of competitiveness. Universities need to innovate to be competitive.

For Slovakia, the results of such or similar analyzes with a focus on the public higher education sector are absent. Public universities are compared by size, especially in terms of the number of students or the number of study programs. Most of the previous analyzes (Abramishvili and Tsirekidze, 2019; Banadkouki et al., 2018; Alaşehir et al., 2014; Witte and Hudrlikova, 2013) focus on the comparison of universities with other universities in the world. These comparisons are made based on available rankings, which do not always correspond to the conditions of public universities in Slovakia. Therefore, the results of this paper can be considered original, and, in this context, they cannot be compared with the results of the same focus. If we consider the evaluation of universities according to selected rankings, then the results of the evaluation of universities according to the competitiveness coefficient reach almost the same order. Also, the paper offers many insights that can inspire and encourage research into financial management in other public sectors (Ivanková et al., 2020).

Conclusion

Slovak higher education has undergone many changes that have impacted the number and form of higher education institutions, the structure of their study offers, research activities, their relationship with the state, internal management, the quality assurance system, etc. The intention of all stakeholders (university management, students, academics, funding institutions, and policymakers) is to promote the basic academic values of the higher education area, to support activities in the field of social inclusion, educational innovation, and the internationalization of higher education institutions. The aim is to develop the community economy and the knowledge economy, together with other stakeholders in society, to shape the future of a knowledge-based society.

2021
Vol.24 No.2

POLISH JOURNAL OF MANAGEMENT STUDIES
Jenčová S., Vašaničová P., Štefko R., Lukáčová M.

The European University Association has published a report "Universities without walls: A vision for 2030". It addresses global issues, such as the UN Sustainable Development Goals agenda, the digital transformation, the geopolitical situation and the global tensions, and the impact of COVID-19. Because of these issues and fundamental challenges, according to the EUA, European universities must remain firmly rooted in their values of academic freedom, institutional autonomy and scientific integrity (SRK, 2021).

This paper pointed out the insufficient funding of higher education in Slovakia in comparison with selected countries. In Slovakia, insufficient or very low attention is paid to the sector of educational services. In terms of funding, Slovakia lags the EU average. Therefore, in all EU countries, especially in Slovakia, more investment is needed in research, education and innovation to help meet the challenges of the new decade and contribute to all countries' ability to gain access and develop new knowledge and key technologies. In terms of financial analysis, financial stability in the form of a balanced budget, diversified sources of funding, efficient use and ongoing planning is important for the education services sector. The importance of financial indicators for evaluating the success of educational services is related to increasing commercialization and competition in the non-profit sector. Survival and viability factors and sustainability are perceived as important for assessing the success of non-profit organizations. The question is how to evaluate the success of an organization that does not work effectively and has been supported by the public budget long time. Last but not least, universities should pay attention to the goals of sustainable development.

The future research plan is the regular monitoring of universities by applying the above-mentioned competitiveness analysis. Because Slovak tertiary education sector is underfunded, it is necessary to focus not only on non-financial indicators but also on financial indicators and retrospective financial analysis. The first aim of further research may be a multi-criteria evaluation of educational services in the context of financial management. The second aim would be to compare Slovak public universities with EU universities, and determine the position of universities in the world rankings.

Acknowledgements

POLISH JOURNAL OF MANAGEMENT STUDIES
Jenčová S., Vašaničová P., Štefko R., Lukáčová M.

2021
Vol.24 No.2

References

Abdimomynova, A., Duzelbayeva, G., Berikbolova, U. Kim, V. and Baimakhanova, A., (2021). Entrepreneurship Education Prospects in The Public-Private Partnership System. *Montenegrin Journal of Economics*, 17(2), 83-92.

Abramishvili, Z., Tsirekidze, D., (2019). Value Added of Universities: Evidence From Georgia. *Economics Bulletin*, *39*(3), 2184-2191.

Alaşehir, O., Murat P.C., Cengiz Nazife B. and Akbulut, U., (2014). URAP-TR: a national ranking for Turkish universities based on academic performance. *Scientometrics*, *10*(1), 159-178.

Amirkhanova, L. R., Bikmetov, E. Y., Zinnurov, U. G. and Kharisova, A. Z., (2017). Management of university competitiveness based on image creating research. *Journal of Business and Retail Management Research*, *11*(2), 40-48.

Bačík, R., (2007). Marketingová orientácia vysokoškolskej organizácie. *Marketing vzdelávacích inštitúcií: Conference Proceedings.* Trnava, UCM, 35-45.

Banadkouki, M. R. Z., Vahdatzad, M. A., Owlia, M. S. and. Lotfi, M. M., (2018). Ranking Iranian universities: an interpretative structural modeling approach. *Scientometrics*, *117*(3), 1493-1512.

Bolli, T., Olivares, M., Bonaccorsi, A., Daraio, C., Aracil, A. G. and Lepori, B., (2016). The differential effects of competitive funding on the production frontier and the efficiency of universities. *Economics of Education Review*, *52*, 91-104.

Burgstahler, D. C., Sawers, K. M., (2017). Management of financial performance measures: Evidence from private colleges and universities. *Journal of Governmental & Nonprofit Accounting, 6*(1), 1-29.

Carvalho, F.P., Maia, V.M., Louzada, L.C. and Goncalves, M.A., (2017). Sectorial performance of Brazilian companies: a study from the standpoint of ROE, Tobin's Q ratio and Market to Book. *Finanças e Contabilidade, 7*(1), 149–163.

Cheng L., Tang B., (2010). Applied research on creative DuPont analysis system in listed companies. *Proceedings of the International Conference on the Growth of Firms and Management Innovation.* Shijiazhuang Peoples R., China, 511–516.

Cibák, L., Kollár, V. and Filip, S., (2021). Measuring and evaluating education quality of future public administration employees at private university in the Slovak Republic. *Insights into the Regional Development*, 3(2), 213-228.

Cretan, G. C., Gherghina, R., (2015). Funding higher education in a few EU countries: Implications for competition and competitiveness in higher education. *Journal of Knowledge Management, Economics and Information Technology*, *1*(1), 1-22.

Dabylova, M., Sroka, M. and Alibekova, G., (2020). New challenges in education processes at technical faculties in Asian countries of the former Soviet Union. Production Engineering Archives, 26(1) 15-18.

Dachyar, M., Dewi, F, (2015). Improving university ranking to achieve university competitiveness by management information system. *Proceedings of Materials science and engineering,* IOP conference series, 83(1), 1-8.

Eger, L. et al., (2002). *Strategie rozvoje školy.* Plzeň, Cechtuma.

El Talla, S. A., FarajAllah, A., Abu-Naser, S. S. and Al Shobaki, M. J., (2018). The Reality of the Overall Performance Level in the Palestinian Universities. *International Journal of Academic Multidisciplinary Research*, *2*(9), 21-29.

EUA, (2020). *Bologna Process*. European University Association. [Online]. Available at: https://eua.eu/issues/10:bologna-process.html#sec-towards-2024-and-2030 [Accessed on 17 September 2021].

Fedorko, R., (2017). Špecifiká online komunikácie uchádzačov o vysokoškolské vzdelanie. *Journal of global science*, *2*(4), 1-7.

Filčák, T., (2019). Vybrané indikátory z Education at a Glance, 2019, Vysokoškolské vzdelávanie na Slovensku a v stredoeurópskych štátoch OECD. *Academia, Bratislava, CVTI*, *30*(4), 27-21.

Filčák, T., (2020). Pracovné aktivity vysokoškolských absolventov počas štúdia na vysokej škole. *Academia, Bratislava, CVTI*, *32*(4), 17-21.

Gavurova, B., Ivankova, V. and Rigelsky, M., (2020). Relationships between perceived stress, depression and alcohol use disorders in university students during the COVID-19 pandemic: A socio-economic dimension. *International Journal of Environmental Research and Public Health*, *17*(23), 8853.

Girdzijauskaite, E., Radzeviciene, A. and Jakubavicius, A., (2019). Impact of international branch campus KPIs on the university competitiveness: FARE method. *Insights into Regional Development*, 1(2), 171-180.

Global Forum, (2019). *Global Forum on Academic Freedom, Institutional Autonomy, and the Future of Democracy: Declaration*. [Online]. Available at: https://rm.coe.int/global-forum-declaration-global-forum-final-21-06-19-003-/16809523e5 [Accessed on 17 September 2021].

Gurňák, D., Križan, F. and Lauko, V., (2009). Lokalizácia vysokých škôl na území Slovenska v časovo-priestorových súvislostiach. *Úloha univerzít v regionálnom rozvoji: Conference Proceedings*, Košice, UPJŠ, 64-83.

Hanová, M., Moravčíková, D., Rehák, Š. and Vozár, L., (2016). *Posilnenie úlohy vysokých škôl v regiónoch*. Bratislava, MŠVVaŠ.

Herciu, M., Ogrean, C. and Belascu, L., (2011). A Du Pont analysis of the 20 most profitable companies in the world. *Proceedings of the International Conference on Business and Economics Research ICBER 2010*. Malaysia, Kuala Lumpur, 1, 45–48.

Hopbach, A., (2012). External Quality Assurance Between European Consensus and National Agendas. In Curaj, A., Scott, P., Vlasceanu, L., and Wilson, L. (Eds), *European Higher Education at the Crossroads. Between the Bologna Process and National Reforms*, 267-285. Springer.

Horňák, F., Šujanová, J., Cagáňová, D. and Pavlendová, G., (2014). *Manažment vysokých škôl*. Bratislava, STU.

Horobet, A., Lupu R., Dumitrescu, S., Dumitrescu, DG. and Tintea, I., (2011). Dynamic trade-offs in financial performances of Romanian companies. *Proceedings of the 4th International Conference on Globalization and Higher Education in Economics and Business Administration– GEBA 2010*. Romania, 313–321.

Ivanková, V., Rigelský, M., Kotulič, R. and Gonos, J., (2020). The governance of efficient healthcare financing system in OECD countries. *Polish Journal of Management Studies*, *21*(2), 179–194.

Jenčová, S., (2018). *Aplikácia pokročilých metód vo finančno-ekonomickej analýze elektrotechnického odvetvia Slovenskej republiky*. Ostrava, VSB-TU.

Kaur, S., Singh, G., (2020). Financial Comparative Analysis of State Public Universities of Punjab. *International Journal of Economics and Financial Issues*, *10*(5), 140-144.

POLISH JOURNAL OF MANAGEMENT STUDIES
Jenčová S., Vašaničová P., Štefko R., Lukáčová M.

2021
Vol.24 No.2

Kruk, H., Waśniewska, A., (2017). Application of the Perkal method for assessing competitiveness of the countries of Central and Eastern Europe. *Oeconomia Copernicana*, *8*(3), 337–352.

Kubak, M., Gavurova, B. and Drotar, G., (2019). On the technical efficiency and productivity changes development in Slovakian institutions of higher education 2005-2015: Malmquist index approach. *Transformations in Business & Economics*, *18*(2), 215–236.

Kyaw, N.A., Theingi, H., (2009). A performance analysis of wholly owned subsidiaries and Joint Ventures: Electrical and electronic industry in Thailand. *International Journal of Business Studies*, *17*(1), 107–125.

Lauko, V., Gurňák, D. and Križan, F., (2013). Prešovská univerzita – postavenie a priestorová pôsobnosť v rámci verejných vysokých škôl Slovenska, Prešov. *Folia Geographica*, *22*, 69-80.

Lee, S.Y., (2016). An Analysis of Production function of Korean Accounting firms. *Advanced Science Letters, 22*(11), 3598-3625.

Lincényi, M., Laczko, M. (2020). Influence of Brexit on Education towards Europeanism. *Insights into Regional Development*, 2(4), 814-824.

Lubinski, C., Fear, J. and Perez, P.F., (2013). Family multinationals: Entrepreneurship, governance, and pathways to internationalization. *Routledge International Studies in Business History*, *23*, 1–274.

Mahdi, O. R., Nassar, I. A. and Almsafir, M. K., (2019). Knowledge management processes and sustainable competitive advantage: An empirical examination in private universities. *Journal of Business Research*, *94*, 320-334.

Mathenge, P. W., Muturi, W., (2017). Effects of financial management practices on financial performance of public Universities in Kenya. *International Journal of Social Sciences and Information Technology*, *3*(8), 2354-2363.

Menshikov, V., Kokina, I. and Ruza, O., (2021). The entrepreneurial potential of Latvian students: The role of the university environment. *Entrepreneurship and Sustainability Issues*, 9(1), 502-518.

Mhamed, A. A. S., Vossensteyn, H. and Kasa, R., (2021). Stability, performance and innovation orientation of a higher education funding model in Kazakhstan. *International Journal of Educational Development*, *81*, 1-6.

Mihola, J., Kotesovcova, J., (2015). The intensity of development and making of Du Pont's model. *Proceedings of the 10th International Scientific Conference on Financial Management of Firms and Financial Institutions*. Ostrava, 799–806.

Mikoláš, Z., Peterková, J. and Tvrdíková, M. et al., (2011). *Konkurenční potenciál průmyslového podniku.* Praha, C.H. Beck.

Mokrišová M., Horváthová J., (2020). Bankruptcy Prediction Applying Multivariate Techniques. In: *Journal of Management and Business: Research and Practice. 12* (2), 52-69.

Muscio, A., Quaglione, D. and Vallanti, G., (2013). Does government funding complement or substitute private research funding to universities?. *Research Policy*, *42*(1), 63-75.

Navickas, V., Grenčíková, A. and Krajčo, K. (2021). DEA model and efficiency of universities – case study in Slovak Republic. *Entrepreneurship and Sustainability Issues*, 9(1), 348-362.

OECD, (2019). *Education at a Glance 2019, OECD Indicators*. [Online]. Available at: https://www.oecd-ilibrary.org/education/education-at-a-glance-2019_f8d7880d-en [Accessed on 17 September 2021].

2021
Vol.24 No.2

POLISH JOURNAL OF MANAGEMENT STUDIES
Jenčová S., Vašaničová P., Štefko R., Lukáčová M.

Petruk, G. V., (2018). Internationalization of higher education of China as the factor of university competitiveness increase. *Revista San Gregorio*, *25*, 179-185.

Rehák, Š., (2019). Vysoké školy v strednej a východnej Európe –štrukturálne a priestorové aspekty. *Conference Proceedings of the XXII. medzinárodní kolokvium o regionálních vědách*, Brno: Masaryk University, s. 1–5.

Rudrajeet, P., Aneja, A.P., (2017). Ambidexterity drivers of value-creation and appropriation in business models an explorative study from Du Pont. *Research Journal of Textile and Apparel, 21*(1), 2–26.

Slovenská rektorská konferencia (SRK), (2021). *Univerzity bez múrov. Vízia EUA do roku 2030*. [Online]. Available at: https://www.srk.sk/sk/aktuality/482-univerzity-bez-murov-vizia-eua-do-roku-2030 [Accessed on 17 September 2021].

Stanowicka, A. (2021). The role of universities in urban development on the example of Polish cities. *Entrepreneurship and Sustainability Issues*, 9(1), 680-691.

Stimac, H., Simic, M. L., (2012). Competitiveness in higher education: A need for marketing orientation and service quality. *Economics & Sociology*, *5*(2), 23-34.

Tkacova, A., Gavurova, B., Danko, J. and Cepel, M., (2017). The importance of evaluation of economic determinants in public procurement processes in Slovakia in 2010-2016. *Oeconomia Copernicana*, 8(3), 367–382.

Ulewicz, R., Sethanan, K. (2020). Experience with the accreditation of technical studies in Poland and Thailand's, International Symposium on Project Approaches in Engineering Education 10, 149-156

Vančíková, K., (2019). Vývoj počtu vysokoškolákov. *Analýza zistení o stave školstva na Slovensku,* Bratislava, MESA10, 774-777. [Online]. Available at: https://analyza.todarozum.sk/analyza-zisteni-o-stave-skolstva-na-slovensku.pdf [Accessed on 17 September 2021].

Vasiu, D., Baltes, N. and Ciudin, A., (2012). Study regarding financial performance from Du Pont analysis perspective. *18th International Conference – The Knowledge-based Organization: Economic, Social and Administrative Approaches to the Knowledge-based Organization*, Sibiu, Romania, 360–365.

Vitkova, E., Semenova, T., (2015). The Impact of Key Parameters Change on Economic (CENTERIS). International Conference on Project MANagement (ProjMAN). Development of the *Company. Proceedings of the Conference on ENTERprise Information Systems: International Conference on Health and Social Care Information Systems and Technologies (HCist)*. Vilamoura, Portugal, 64, 744–749.

Vlasov, M., Panikarova, S. and Draskovic, M., (2020). *Evaluating University Academic Efficacy: Institutional Approach,* Montenegrin Journal of Economics, 16(1), 241-250,

Witte, K., Hudrlikova, L., (2013). What about excellence in teaching? A benevolent ranking of universities. *Scientometrics*, *96*(1), 337-364.

Wu, D., Yuan, L., Li, R. and Li, J., (2018). Decomposing inequality in research funding by university-institute sub-group: A three-stage nested Theil index. *Journal of Informetrics, 12*(4), 1312-1326.

Wu, J., (2015). Distributions of scientific funding across universities and research disciplines. *Journal of Informetrics, 9*(1), 183-196.

Zhang F.J., Han L. and Zhang J. C., (2016). The Analysis of Property Insurance Company's Profitability and its Impact Faktor. *Proceedings of the 7th China International Conference on Insurance and Risk Management (CICIRM)*. Xian Univ Finance & Econ, Sch Econ, Xian, PEOPLES R China, 235–248.

ANALIZA FINANSOWA I KONKURENCYJNOŚĆ UCZELNI PUBLICZNYCH SŁOWACJI W KONTEKŚCIE ZARZĄDZANIA FINANSAMI

Streszczenie: Celem artykułu jest zastosowanie metod w zarządzaniu finansami publicznych jednostek decyzyjnych w branży usług edukacyjnych na Słowacji reprezentowanej jako NACE Rev. 2 85.42.0 – Szkolnictwo wyższe. Artykuł przedstawia bliżej finansowanie uniwersytetów publicznych na Słowacji od 1989 roku do chwili obecnej. Chodzi o zajęcie się pozycją uczelni publicznych i rozwojem całego szkolnictwa wyższego. Zwrócono uwagę na wskaźniki finansowe i niefinansowe sektora szkolnictwa wyższego, retrospektywną analizę finansową uczelni publicznych na Słowacji oraz ich konkurencyjność. Brak jest wyników takich lub podobnych analiz skupiających się na publicznym sektorze szkolnictwa wyższego. Wyniki pokazują, że finansowanie uczelni publicznych na Słowacji jest na niskim poziomie w porównaniu z wybranymi krajami UE. Uniwersytet Techniczny w Koszycach, Uniwersytet Pavola Jozefa Safarika w Koszycach oraz Uniwersytet Comeniusa w Bratysławie stanowią ranking najlepszych jednostek decyzyjnych systemu szkolnictwa wyższego na poziomie krajowym. Uniwersytety na Słowacji muszą dostosować się do potrzeb przyszłości; w przeciwnym razie za kilka lat powiększy się liczna grupa bezrobotnych. Ważna jest współpraca między uczelniami a przedsiębiorstwami na poziomie krajowym i międzynarodowym, wszystko w kwestii zwrócenia uwagi na cele zrównoważonego rozwoju.

Słowa kluczowe: sektor, mierniki finansowe, finansowanie, uczelnia publiczna, usługi edukacyjne, analiza finansowa.

财务管理背景下斯洛伐克公立大学的财务分析和竞争力

摘要：本文的目的是将方法应用于斯洛伐克教育服务行业公共决策单位的财务管理，以 NACE Rev. 2 85.42.0 - 高等教育为代表。该论文详细介绍了 1989 年至今斯洛伐克公立大学的资助情况。这个想法是处理公立大学的地位和整个高等教育的发展。关注高等教育部门的财务和非财务指标、斯洛伐克公立大学的回顾性财务分析及其竞争力。没有针对公立高等教育部门的此类或类似分析的结果。结果表明，与选定的欧盟国家相比，斯洛伐克公立大学的资助水平较低。科希策技术大学、科希策 Pavol Jozef Safarik大学和布拉迪斯拉发Comenius大学代表了国家级高等教育系统最佳决策单位的排名。斯洛伐克的大学必须适应未来的需求；否则，一大批失业者将在几年内增加。大学与企业在国家和国际层面的合作很重要，所有这些都关乎关注可持续发展目标的问题。

关键词：部门、财务指标、资金、公立大学、教育服务、财务分析。