Maxim Korneyev, Olha Hryhorash

MODELS OF HIGHER EDUCATION FUNDING IN OECD COUNTRIES AND UKRAINE

ABSTRACT

The models of higher education funding according to the ratio of public and private resources are considered in the chapter. The analysis was carried out on the basis of statistical data of the OECD countries and Ukraine in 2017-2019. The countries were allocated according to the level of the specific weight of public spending into three groups: with a high share of budget funds (bureaucratic model), a low share (market model) and a moderate share (collegial model). Within the obtained groups an indicator of the efficiency of higher education state spending was analyzed. It was calculated on the basis of GDP growth generated by labor with better skills (labor with higher education) and the discount rate.

Many approaches of the organization of higher education funding are considered in the literature. For example, the allocation of countries into groups depending on the amount of tuition fees: free education (Germany, Denmark, Finland, Norway, Greece, Great Britain, Sweden, Austria), low fees (France), high fees (Switzerland, Belgium, Spain, Italy, Netherlands, Ireland) (Kovalko, 2018 [5]).

Villarreal & Ruby (2018) [11] use the simplest classification of higher education funding approaches: public and private financing on the example of the USA and Great Britain, describe the models of allocation of budget resources: Incremental-based, Per capita-based, Per credit-based and Performance-based funfing approaches and emphasize the appropriateness of their implementation in the relevant conditions of the socio-economic development of countries.

Zatonatska et al (2019) [14], based on the research of Pranevičienė & Pūraitė (2010) [7], consider three models of higher education funding: bureaucratic, collegial and market. The author comes to the conclusion that the market model is the most

effective in modern realities and describes the experience of endowment funds for obtaining additional financing for the development of educational institutions.

Ivanova et al. (2019) [4] analyzes the opportunities of optimizing the system of higher education funding in Ukraine and notes that Ukraine has already moved away from the bureaucratic financial model of higher education, but has not yet fully implemented the collegial model. The author supports the CEDOS analytical center's proposal to change the public procurement mechanism with a performance-based model of state funding of universities.

The of higher education funding is especially relevant in the context of overcoming the consequences of the pandemic. As a result of quarantine restrictions and border closures, world universities lost part of their income from foreign students and were forced to provide support to the least protected students. For example, for primary education students, France has introduced exceptional aid for those in need, available to both scholarship recipients and non-scholarship recipients, regardless of their nationality. This was aimed at students who lost paid work or internships due to the impact of COVID-19.

Germany has changed and expanded its €650 per month student loan program; this program was opened to all international students (who were identified as the target group) and was disbursed as a monthly interest-free loan until the end of March 2021. In Ireland, international students, who became unemployed due to Covid-19, were eligible to access unemployment benefits due to the COVID-19 pandemic without breaching their immigration conditions, which normally do not allow them to use public funds.

Non-EU OECD countries have also taken similar measures. Japan in particular has offered general support programs for university students to which international students were also eligible. Examples include a cash payment of up to JPY 100,000 (approx. EUR 790) for all residents and a loan of up to JPY 200,000 (approx. EUR 1,587) for university students, including international students (Yovova, 2020 [13]).

In 2020 and 2021, Canada doubled the amount of the need-based student grant for full-time students, including international students, to $6,000 (€4,053) per standard 8-month academic year. In New Zealand, the support available under the COVID-19 International Assistance Program has been extended to 31 August 2021 for international students experiencing temporary hardship due to the effects of COVID-19 (European Migration Network, 2021 [10]).

Based on the analysis of the global experience of higher education funding, Ward et al (2020) highlight three main recommendations for optimizing the higher education funding in the USA: determining the minimum funding level for the training of one student; adjustment of funding formulas taking into account the different needs of students and educational institutions; using performance indicators to identify areas of need rather than penalize institutions.

In this chapter, the basis of the analysis of higher education funding models is based on the ratio of public and private resources (Figure 1).

Source: compiled by the authors according to Zatonatska et al (2019) [14], Pranevičienė & Pūraitė (2010) [7], Ivanova et al. (2019) [4].

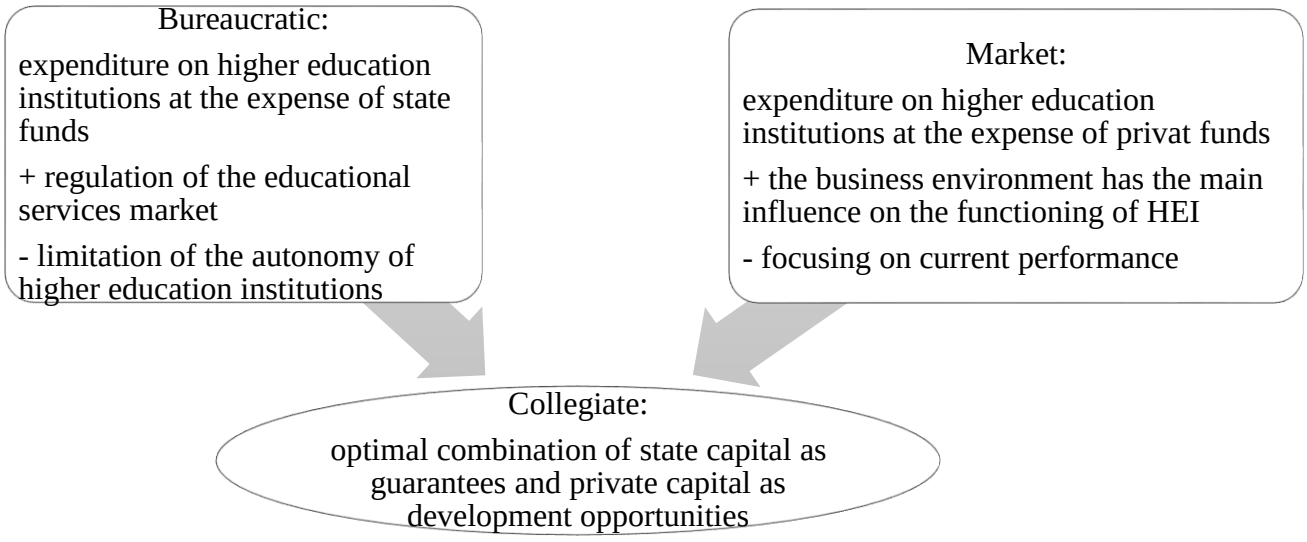
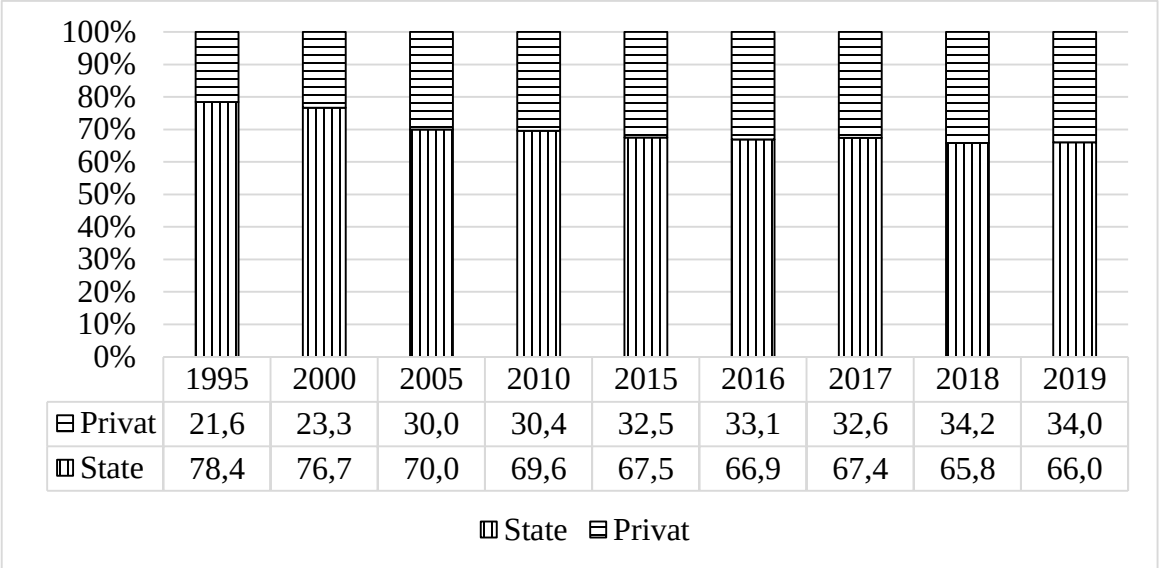


Figure. 1. Higher education funding models

The analysis of statistical data on the sources of higher education funding in OECD countries (Figure 2) showed that during 1995-2019, public expenditures on higher education funding significantly exceeded private and international resources in terms of volume. At the same time, there is a trend towards an increase in the specific share of private resources: if in 1995 the share of private resources in the structure of financing sources was 21.6%, then in 2010 it increased to 30.4%, and in 2019 - to 34.0%. This is due to a number of reasons, including:

- an increase in the number of higher education recipients;
- limited state financial resources;
- the desire of educational institutions to increase the level of autonomy.

Source: compiled by the authors according to OECD data (1995-2019) [6].



	1995	2000	2005	2010	2015	2016	2017	2018	2019
Privat	21,6	23,3	30,0	30,4	32,5	33,1	32,6	34,2	34,0
State	78,4	76,7	70,0	69,6	67,5	66,9	67,4	65,8	66,0

Figure. 2. Allocation of funding sources for higher education on average in the OECD in 1995-2019

The analysis of the sources of higher education funding in OECD countries during 1995-2019 (table. 1).

Table 1

Allocation of funding sources for higher education in the OECD in 2000-2019

Source: compiled by the authors according to OECD data (1995-2019) [6].

Country	2000		2010		2019	
	Public	Privat	Public	Privat	Public	Privat

Canada	60,9	39,1	57,2	42,8	53,7	46,3
Chile	19,5	80,5	23,4	76,6	38,9	61,1
Czech Republic	84,0	16,0	75,8	24,2	76,2	23,8
Finland	97,2	2,8	95,9	4,1	90,4	9,6
France			80,8	19,2	75,3	24,7
Germany			84,6	15,4	81,2	18,8
Greece	99,7	0,3			74,7	25,3
Iceland	91,8	8,2	91,2	8,8	88,7	11,3
Israel	60,1	39,9	54,2	45,8	52,5	47,5
Italy	77,2	22,8	66,1	33,9	61,0	39,0
Japan			34,4	65,6	32,6	67,4
Latvia	56,0	44,0	52,0	48,0	57,5	42,5
Netherlands	74,1	25,9	70,1	29,9	68,3	31,7
New Zealand	52,1	47,9	56,2	43,8	53,7	46,3
Norway	96,3	3,7	96,0	4,0	92,2	7,8
Poland	99,5	0,5	68,4	31,6	79,7	20,3
Portugal	92,5	7,5	65,2	34,8	60,0	40,0
Spain	74,4	25,6	78,2	21,8	65,2	34,8
Sweden	88,9	11,1	87,0	13,0	83,4	16,6
United States	43,7	56,3	40,0	60,0	35,7	64,3

Based on the data analysis of table. 1, a number of conclusions can be drawn, in particular:

1. in the majority of countries, higher education funding at the expense of the state prevails over funding at the expense of private and international sources, the exceptions are Chile, Japan, Korea, the United Kingdom and the United States (the share of private and international financing is more than 60%);

2. all countries are characterized by a tendency to increase the share of public funding during the analyzed period, with the exception of Latvia, New Zealand and Chile, where the share of public funding changed from 19.5% in 2000 to 38.9% in 2019.

Taking into account the fact that the structure of financial resources of higher education institutions in the OECD countries as a whole remained stable, it can be assumed that the funding models of higher education did not change during 20 years. At the same time, it is necessary to take into account the fact that the described trends

may be revised with the appearance of statistical data on the financial support of higher education in 2020 due to the consequences of the impact of funding pandemic.

Since the application of the bureaucratic model of funding (100% state funds) or market (100% private funds) is not carried out in practice, the analysis of distribution of OECD countries according to higher education funding models is presented in the table. 1. Conditional distribution was made with Ward's clustering method using IBM SPSS Statistics with the specified number of groups - 3 (Table 2).

According to the results of the grouping the countries are divided into 3 clusters according to the level of the share of state funds in the amount of of higher education expenditures.

Table 2

The groups of countries by the level of the share of public funds in the amount of higher education funding

Source: Processed by authors in IBM SPSS Statistics

Cluster	Country
1	Australia, Chile, Japan, Korea, United States, Ukraine
2	Austria, France, Germany, Greece
3	Canada, Ireland, Israel, Italy, Latvia, Netherlands, New Zealand, Portugal, Spain

Thus, the following characteristics of countries according to the level of state expenditures on higher education were received (Table 3).

Table 3

Characteristics of countries according to the level of state expenditures on higher education

Source: Processed by authors in IBM SPSS Statistics

Ward Method	Average	Number of countries	Standard deviation	Minimum	Maximum	Model
1	38,0	6	4,45	32,0	44,1	Market
2	81,5	4	5,74	77,0	89,0	Bureaucratic
3	59,8	9	6,36	52,0	68,0	Collegiate
Total	X	19	16,91	32,0	89,0	

Accordingly, the market model (on average for the group the share of public expenditures on higher education is 38.0%) is represented by such countries as Australia, Chile, Japan, Korea, United States, Ukraine; the bureaucratic model, where the share of public spending on higher education is on average 81.5% and ranges from 77.0% to 89.0%, includes such OECD countries as Austria, France, Germany, Greece; the 'golden middle' includes Canada, Ireland, Israel, Italy, Latvia, the Netherlands, New Zealand, Portugal, Spain, where the average share of higher education expenditures is 59.8% and ranges from 52% to 68%.

It should be emphasized that the focus of attention remains only on the share of budgetary resources in the amount of expenses for the training of one student, but the mechanism of distribution of state funds between educational institutions is not taken into account.

The next step of analysis is to consider the efficiency of public spending on higher education is in countries that use the described models. One of the ways to analyze the usefulness of higher education funding for the state is to evaluate the increase in GDP due to the improvement of the qualifications of employees and the calculation of the discounted cash flow over an infinite time interval (Hryhorash et al, 2022 [3]). Using a given discount rate, it is possible to determine how effective budget investments are in training specialists with higher education:

$$E_i = \frac{DI_{\Delta}^{i}}{S^i} \quad (1)$$

E_i – efficiency of higher education expenditure in i-country;
DI_{Δ}^{i} – discounted cash flow;
S^i – expenditure of higher education funding.

Based on calculations of GDP growth as a result of higher education of the employed population (increase in the number of employed people with higher education) and discounted cash flow, an indicator of the efficiency of budget expenditures on higher education was obtained. This indicator needs to be considered

during the last 3 years (according to the availability of statistical information) within the groups of countries that use the described higher education funding models (Table 4).

Table 4

Indicators of the efficiency of higher education expenditures in OECD countries and in Ukraine

Source: compiled by the authors according to OECD data (2017-2019) [6, 15, 16], World Bank data (2016-2019) [1, 2, 9].

Model		2017			2018			2019		
		ΔGDP	**Efficiency**	**Share**	**ΔGDP**	**Efficiency**	**Share**	**ΔGDP**	**Efficiency**	**Share**
Market	CHL	54,2	150,9	37,8	80,2	66,3	35	32,3	57,2	33,7
	JPN	23,4	74,2	31,2	22,3	48,2	41	-44,5	-65,0	38,9
	KOR	71,6	288,2	38,1	39,2	118,2	32	11,8	7,9	32,6
	USA	78,0	129,3	35,1	196,4	276,7	40	-22,7	-24,3	38,3
Bureaucratic	AUT	55,0	10,2	91,1	89,0	22,8	89	100,9	21,0	89,0
	FRA	53,7	13,3	77,0	82,7	29,1	77	264,6	76,4	75,3
	DEU	58,5	12,3	83,0	70,8	20,6	83	170,6	42,2	81,2
	GRC	16,6	21,0	77,0	84,8	147,4	77	51,9	65,4	74,7
Collegiate	CAN	64,5	45,2	53,9	99,6	80,4	52	9,2	4,5	53,7
	IRL	185,0	53,1	66,9	514,9	207,1	68	7,8	2,6	68,5
	ISR	91,4	78,2	58,5	43,1	51,0	53	163,5	303,5	52,5
	ITA	47,6	56,0	61,8	73,6	121,2	62	119,0	192,2	61,0
	LVA	18,8	12,1	59,8	24,6	19,4	58	-3,1	-1,8	57,5
	NLD	65,8	15,5	66,9	81,1	26,8	68	-10,4	-2,9	68,3
	NZL	77,2	147,5	50,8	37,0	63,4	53	8,9	3,5	53,7
	PRT	26,7	12,2	59,7	23,3	15,6	59	-20,0	-7,7	60,0
	ESP	36,7	13,3	66,3	47,1	24,7	65	-64,9	-27,6	65,2
	UKR	11,5	41,9	49,3	5,4	21,4	47,0	10,0	7,8	44,0*

*in 2019 Ukraine was included into the group of countries that use the market model

Based on the data in the table 4, it is concluded that in 2017-2018 in countries where the market model is used, the indicators of the efficiency of higher education expenditures are generally higher than in groups of countries that use other models. Of course, this is explained by the fact that with small investments in education, the growth of GDP in countries is approximately the same. In countries where the bureaucratic model is used, the indicators of the efficiency of higher education expenditures in 2017-2018 are significantly lower than in countries with a market model of funding. In 2019,

on the background of the general reduction of GDP in a lot of countries, the efficiency indicator decreased significantly and became negative. Also, the fluctuation of the discount rate had a significant impact on the level of indicator.

With regard to Ukraine, it should be noted that during 2017-2019 the share of public expenditures tended to decrease, which contributed to Ukraine moving from the group of countries applying the collegiate model to the group of countries applying the market model in 2019. A decrease in the efficiency of higher education expenditures is noted.

Thus, the analysis of higher education funding models in the OECD countries and in Ukraine showed that the division of countries into groups according to the funding model is conditional, since no country can apply a funding model with 100% public or private sources. On the basis of statistical information on the share of public expenditures in the amount of expenditures for the training of one student, the countries were divided into three groups: with a low share of public expenditures (market model), with a high share of public expenditures (bureaucratic model), and countries that did not meet the criteria listed above , were assigned to the group with a moderate level of budget funding (collegiate model). The results of the analysis showed that most of European countries use a collegiate or bureaucratic model. The market model is typical for use in Australia, Chile, Japan, Korea, and the United States.

Based on the calculated indicators of GDP growth caused by the increase in the level of higher education and the discount rate, an indicator of the efficiency of government spending on higher education funding was determined. In 2017-2018, the value of the indicator was the highest in countries applying the market model and the lowest in countries applying the bureaucratic model. On the background of the general reduction of GDP in 2019 in a majority of countries, the described trend did not persist: Israel and Italy had the highest indicators of the effectiveness of spending on higher education.

The perspective of further research is the assessment of the efficiency of higher education expenditures in countries where different mechanisms for the distribution of financial resources are used.

References

1. GDP. World Bank data. Retrieved from: https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?view=chart
2. Gross fixed capital formation. World Bank data. Retrieved from: https://data.worldbank.org/indicator/NE.GDI.FTOT.CD
3. Hryhorash O., Bocharov, D., Bondar, A., Zhuravka, O., Mordan, Ye & Teslenko T. The efficiency of individual and public spending on higher education in OECD countries and in Ukraine. Financial and Credit Activity Problems of Theory and Practice, 5(46), 453–462. https://doi.org/10.55643/fcaptp.5.46.2022.3909.
4. Ivanova, N., Kuznetsova, T., Khoma, I. (2019). Modern trends in higher education funding. Modern science - Moderni veda 3, 44 – 54. Retrieved from: http://ekmair.ukma.edu.ua/bitstream/handle/123456789/17313/Ivanova_Modern_trends_in_higher_education_funding.pdf?sequence=1&isAllowed=y.
5. Kovalko N. (2018). Education funding models: which is our? Obozrevatel. Retrieved from: https://news.obozrevatel.com/society/modeli-finansuvannya-osviti-yaka-e-dijsno-nashoyu.htm
6. OECD. (2019). *Relative shares of public, private and international expenditure on educational institutions*. OECD Publishing. Retrieved from: https://stats.oecd.org/index.aspx?queryid=93063
7. Pranevičienė, B., & Pūraitė, A. (2010). The financing methods of higher education system. Jurisprudence, 4(122), 335-356.
8. Public spending on education. Tertiary. OECD data. Retrieved from: https://data.oecd.org/eduresource/public-spending-on-education.htm#indicator-chart.
9. Real interest rate. World Bank data. Retrieved from: https://data.worldbank.org/indicator/FR.INR.RINR
10. The impact of COVID-19 in the migration area in EU and OECD countries (2021). European Website on Integration. Retrieved from: https://www.oecd.org/migration/mig/00-eu-emn-covid19-umbrella-inform-en.pdf.
11. Villarreal, P., & Ruby, A. (2018). Government Models for Financing Higher Education in a Global Context: Lessons from the US and UK. Philadelphia, PA: Alliance for Higher Education and Democracy (Penn AHEAD), University of Pennsylvania Graduate School of Education.
12. Ward J. D., Pisacreta E. D., Weintraut B. Kurzweil M. (2020). An Overview of State Higher Education Funding Approaches. ITHAKA S+R. Retrieved

from: https://sr.ithaka.org/wp-content/uploads/2020/12/SR-Issue-Brief-Overview-of-State-Higher-Education-Funding-Approaches-121020.pdf

13. Yovova G. (2020). Inform #2 – Impact of COVID-19 on international students in EU and OECD member states European Website on Integration. Retrieved from: https://ec.europa.eu/migrant-integration/library-document/inform-2-impact-covid-19-international-students-eu-and-oecd-member-states_en

14. Zatonatska, T., Rozhko, O., Lyutyy, I., Tkachenko, N and Anisimova, O. (2019). Global Practices of Higher Education Financing: Approaches and Models. Khazar Journal of Humanities and Social Sciences. Vol. 22;№ 4. Retrieved from: https://jhss-khazar.org/wp-content/uploads/2020/02/Global-Practices-of-Higher-Education-Financing-Approaches-and-Models.pdf.

15. Employment rates by place of birth and educational attainment. OECD data. Retrieved from: https://stats.oecd.org/Index.aspx?DataSetCode=MIG_EMP_EDUCATION

16. Annual labour force. OECD data. Retrieved from: https://stats.oecd.org/index.aspx?queryid=27359