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## RECONSIDERATION OF FINANCING HIGHER EDUCATION INSTITUTIONS AT INTERNATIONAL AND NATIONAL LEVEL

Larisa Bugaian\*, ORCID ID 0000-0002-4478-5124

*Technical University of Moldova, 168 Stefan cel Mare Bd., Chisinau, Republic of Moldova*

*\*larisa.bugaian@adm.utm.md*

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**Abstract.** In recent years, the methods of financing higher education institutions around the world have undergone substantial changes. University autonomy requires a rational management of university funds, but especially of public funds. New approaches to budget financing are discussed both in academia and in various publications. Research shows that a wide and diverse range of models is used in European countries to finance higher education institutions. Research shows that budget-financing systems are becoming increasingly complex and demanding. The practice of funding higher education institutions is performed based on a formula that is calculated on indicators regarding the number of effective students, equivalent students, the number of employment, indicators of academic and research performance or strategic university objectives. Even if block grants based on formulas are the main way of budgetary financing, but also negotiated financing also remains an important financing mechanism. The implementation of a formula for calculating the financing of HEIs in the Republic of Moldova brings an increased interest in being acquainted with the financing practices of other states. In this way, it is possible to notice the differences and similarities of approach of the different education financing systems, as well as to identify possible examples of good practice in overcoming common challenges.

**Key words:** *university funding, budget funding, funding formula, block grant.*

**Rezumat.** În ultimii ani, metodele de finanțare a instituțiilor de învățământ superior din întreaga lume au cunoscut transformări substanțiale. Autonomia universitară impune o gestionare rațională a fondurilor universitare, dar îndeosebi a fondurilor publice. Noile abordări privind finanțarea bugetară sunt discutate atât în mediul academic, cât și în diferite publicații. Cercetările arată că în țările europene sunt utilizate o gamă tot mai largă și diversă de modele pentru finanțarea instituțiilor de învățământ superior. Cercetările mai arată că sistemele de finanțare bugetară devin tot mai complexe și mai exigente. Tot mai des este întâlnită practica în care fondurile destinate finanțării instituțiilor de învățământ superior sunt calculate pe baza unei formule bazate pe indicatori privind numărul de studenți efectivi, studenți echivalenți, numărul de angajări în câmpul muncii, indicatori de performanță academică și de cercetare sau obiective strategice universitare. Chiar dacă

subvențiile bloc bazate pe formule reprezintă principala modalitate de finanțare bugetară, oricum, rămân și finanțările negociate, fiind, de asemenea, un mecanism important de finanțare. Implementarea unei formule de calcul a finanțării ÎÎS în R. Moldova trezește un interes sporit față de cunoașterea practicilor de finanțare a altor state. Astfel, se pot sesiza diferențele și asemănările de abordare ale diferitelor sisteme de finanțare a educației, precum și identificarea eventualelor exemple de bună practică în depășirea unor provocări comune.

**Cuvinte-cheie:** *finanțare universitară, finanțare bugetară, formulă de finanțare, grant bloc.*

### **Introduction**

Ongoing international and national economic reforms have changed the approach to higher education institutions (HEI) funding. The general decrease of the budgetary allocations for higher education determined the increase of university autonomy both in the use of revenues, but also of the responsibility for their efficient use. Expanding financial autonomy has placed institutions under severe responsibility regarding the use of public funds, optimizing spending and ensuring financial sustainability by seeking additional sources of funding. Thus, the correlation between university autonomy and the efficiency of the use of public funds, measured on the basis of performance indicators, correlated with the achievement of public policy objectives, becomes an imperative in the vision of new funding systems.

The transformations also indirectly influenced the allocation of budgetary funds for universities, with a clear trend of allocating funds more through block grants rather than on the budget line. Traditionally, historically, HEIs were funded on a budget line, according to which universities receive funding based on cost elements and / or activities. The decision of allocation on cost elements and / or activities is usually made by the relevant Ministry.

Block grants are the most common form of funding of HEIs, consisting of the allocation of funds intended mainly to cover the internal expenses of universities. In most states, block grants are accompanied by restrictions and regulations on how money can be spent. As a result, universities cannot make decisions on the reallocation of this revenue or can only carry out this process within certain limits. This method is also found, in particular, in some Eastern European countries [1].

The university funding through budget lines is made on some estimated cost elements. This funding often takes place at a level determined by the decision of the public authorities, regardless of the local evolution of the cost structure associated with the operation of universities. This model tends to reduce the flexibility of universities in the way they can use the funds.

Currently, in almost all EU countries, universities receive basic funding in the form of a block grant, which they can allocate to internal activities. The block grant is intended to cover the costs of teaching (courses and seminars / practical work), administrative costs and research costs. The level of the block grant is established in the following ways: by negotiation, based on a calculation formula or based on the financing history. Block grant funding, the value of which is set by negotiation, is used only in a few countries, such as Austria, Germany, Spain. Determining the value of the block grant based on the formula is the main way of allocating public funds to state HEIs and is found in most countries included in the EUA study. In practice, however, the means of determining the value of the grant are used in combination even at the level of a country [1].

The achievement of the full principle of university autonomy consists in the fact that the university decides how to use it according to the needs of the institution. But even declaring principles of university autonomy, most countries impose restrictions, tougher or more relaxed, in structuring the grant for internal needs (staff costs, material costs, infrastructure, teaching, research). Only in eight countries (Austria, Belgium, Estonia, Norway, Poland, Slovakia, Switzerland and the United Kingdom) universities have no restrictions on spending allocated resources [1].

### **International approaches to financing higher education institutions**

There are currently several approaches, calculation formulas, but the central question is not yet defined: *to what extent the public funds allocated to a HEI have to be correlated with input or output elements*. It is only clear that the indicators have to refer to the performance of the institution in terms of teaching and research activities.

The main *input* indicators refer to the resources used and / or to the activities carried out by the HEI, usually the number of students and the number of employees are used. Often the number of students is grouped by cycles, and the number of employees structured by academic and non-academic staff, with and without scientific degrees, etc.

In a performance-oriented university funding mechanism, examples of *output* indicators may be the following: the number of credits (ECTS) accumulated by students, the number of graduates, the number of publications or patents granted. Universities can control these results. Other *output* indicators, which are a little beyond the control of universities, would be: the relative success of graduates in the labour market, the number of graduates working in jobs that correspond to their training or the success of universities in generating additional funding from contractual activities.

The choice of output indicators is a controversial issue. The main reason is that the services of a university are not "sold" on a market based on the law in which supply meets demand, and prices are formed on the basis of cost and quality. The market in which universities operate is an imperfect market. Therefore, a multidimensional measure takes place, a number of different indicators will be used to approximate many institutional dimensions, both quantitative and qualitative. However, in practical situations and to prevent some injustices to HEIs, governments often use a number of input indicators alongside output indicators.

According to several studies conducted at the level of European countries, there are several methods emerging for allocating financial resources for HEIs and several methods for allocating them to universities, there being a variety of ways to apply the methods at national level, also used as management tools in higher education. The most common models of budget funding by universities are: formula-based funding, performance-based funding, goal-based funding (through negotiation or competition), project funding or funding based on historical data. European practice shows that these ways of allocating public funds are used in combination, for example: part of the grant block is determined by formula, part by negotiation, and another part can be determined based on the funding history. In European countries, block grant funding, determined on a formula basis, is the most widely used way of allocating public funds, but grants allocated through negotiation also remain an important option in many countries, most using a combination of different ways and models of financing [2].

The *formula-based* funding model is defined as an algorithm that calculates the size of the public grant allocated to HEIs based on standard criteria for the teaching process and / or the conduct of operational activities, in some cases also for scientific research. In practice, there are several models used to describe formula-based funding mechanisms. These would be: funding based on number of students, funding for the teaching process, funding based on unit costs or normative costs.

Many studies mention a variety of such models, depending on the category of indicators or criteria used in the formula. One of the first funding formulas was the input-oriented formula. This financing model uses calculation formulas based on input criteria, such as: the number of employees or their salaries, the number of employees with the scientific title of PhD, the number of students in the bachelor's, master's degree cycle, etc. The most common is the model for financing the teaching process. Currently, the use of the number of teaching staff criterion has decreased in importance, with most countries using the number of students as main criteria.

An example of funding based on input indicators would be the state funding of HEIs in *Portugal* [3]. The formula has the following structure:

$$BR = \{80\% B_{Pi} + 80\% B_{Pa} + 10\% (B_{Pi} + B_{Pa}) I_1 + 10\% (B_{Pi} + B_{Pa}) I_2\} * f_c, \text{ where:}$$

$BR$  - the budget of each institution (referred to as the „reference budget”);

$B_{Pi}$  - standard budget for initial training;

$B_{Pa}$  - standard budget for advanced training;

$I_1 = 1,02 \times (\text{number of teaching staff with a doctoral degree} / \text{total academic staff}) + 1,00$   
(number of teaching staff with a master's degree / total academic staff).

$I_2 = \sum f_i (c, d)$ , where:

$f_i$  = number of research units, classified by research units and dimensions;

$c$  – classification of study units;

$d$  – unit dimension;

$f_c$  = the cohesion factor used to grant that for each institution its budget for year  $x$  is neither higher nor lower than 4% or more than 1.2% higher than the budget for year  $x-1$ .

Another model is *output-oriented* funding, which uses the calculation formula based on output criteria, such as: the number of credits (ECTS) accumulated by students, the number of bachelor's and / or master's degree graduates, the degree of integration of graduates into the labor market, the number / proportion of graduates working in the specialization for which they were trained, etc. This way of financing is an innovative one. In the context of the current trend of the "new public management" it makes a direct and much better link between university funding and the performance expected of them. However, the debates taking place at EU level mention the difficulties of universities in properly measuring performance indicators, with effects in achieving the planned long-term goals.

In practice, education funding formulas tend to be *mixed*, using both input and output criteria, the most common criteria being the number of students enrolled and the number of graduates. An example of funding based on input and output indicators would be the state funding of HEIs in **Sweden** [4].

$$BR = N_{s.ia} \times C_u \times 0,4 + N_{s.ab} \times C_u \times 0,6, \text{ where:}$$

$BR$  - annual reference university budget;

$N_{s.ia}$  - the number of students at the beginning of the academic year;

*Ns.ab* - number of equivalent students calculated based on the number of credits accumulated at the end of the academic year;

*Cu* - standard unit cost for one student;

*0.4 and 0.6* - coefficients that focus funding on the level of completion of study programs.

Unit costs being differentiated by fields of study from 1 for humanities and reaching 6 in the field of arts.

Another mixed model is used to finance HEIs in Denmark [4 - 8]. The financing mechanism is known as the „tax meter” model. Funding is based on the number of credits (ECTS) obtained by students annually. The financial subsidy is allocated on the basis of information from the previous year. The number of equivalent students (*Nse*) being calculated according to the formula:

$$Nse = \text{the number of annual credits} / 60 \text{ ECTS.}$$

The cost per equivalent student varies depending on the field of study. There are three different levels of the tax meter:

Level 1: 42.000 dkr (social sciences, humanities);

Level 2: 64.000 dkr (music, „soft” IT);

Level 3: 98.000 dkr (health, engineering).

The final formula being as follows:

$$\text{Annual university budget} = \sum Nsei \times Cusei, \text{ where:}$$

*i* - level of studies 1, 2, 3;

*Nsei* - the number of equivalent students for the concrete level of studies *i*;

*Cusei* - the cost per equivalent student for the concrete level of studies *i*.

A similar model is used to fund Romanian universities [9]. The financing of state HEIs is made on the basis of a contract concluded between the Ministry of National Education and the respective higher education institution. The financing from public funds of the state HEI is made from the budget of the relevant Ministry and has 3 main directions: core, additional and complementary funding. Of the amount allocated in the national budget for the institutional financing of universities, 1.5% is allocated for the financing of special situations, which cannot be integrated in the financing formula. For the financing of doctoral grants for doctoral students, an amount calculated based on the field of financing is allocated. The remaining amount is distributed as follows:

a) core funding: 72%;

b) additional funding: 26,50%;

c) institutional development fund: 1,50%.

The amounts allocated to each university for core funding, for students enrolled on the basis of tuition fees received by the university, in a bachelor's and master's degree program, are allocated in proportion to their number of equivalent students. The number of unitary equivalent students of the university is determined by weighting the physical number of its students with the equivalence and cost coefficients. Equivalence coefficients depend on the cycle, form of education and branch (field) of science.

The budget of a concrete university is calculated according to the formula:

$$\text{Annual university budget of an institution} = Nse \times Cu, \text{ where:}$$

*Nse* - the number of equivalent students in the university;

*Cu* - the cost per equivalent student calculated, determined as the ratio between the total budget intended for the core funding across the HEI's budget system and the total number of equivalent students across the system of the budget HEI.

The additional funding aims to stimulate quality indicators such as: teaching and learning indicators; scientific research, artistic creation, sports performance; international orientation, regional orientation and social equity.

The complementary funding is provided for subsidies for accommodation and meals, funds allocated on the basis of priorities and specific rules for endowments and other investment and capital repairs expenditure, and funds allocated on a competitive basis for university scientific research.

The same approach to state funding formalized in formula and based on equivalent students, calculated on the basis of credits and adjusted to the field of study, is also used in Lithuania [12].

All the models presented use the indicator of relative unit cost of education, most often for an equivalent student or physical student, for which there is no concrete calculation by fields, levels of education, etc. A student's financing costs can fluctuate because they differ from the overall economic costs. There is also a different approach depending on the strategy of the economy and the country as a whole. For example, Table 1 shows the unit costs for an equivalent student in the Republic of Moldova, Romania, Bulgaria and Lithuania [9 - 12].

Table 1

### Adjustment coefficients for funding groups of study programs

Funding groups of study programs	Adjustment coefficient			
	R. Moldova	Romania	Bulgaria	Lithuania
Economic Sciences, Humanities, Philology, Administrative Sciences, Law, Public Services, Journalism and Information, Tourism, Education Sciences, Pedagogy	1,0	1,0	1,6	1,0
Social sciences, Anthropology, Philosophy, Religion and Theology, Communication sciences, Political sciences	1,0	1,0	2,0	1,0
Natural sciences, Chemical sciences, Biological sciences, Environmental sciences, Physical sciences, Mathematics and statistics, Chemistry, Biology, Physics, Astronomy, Informatics.	1,65	1,65	3,0	1,38
Linguistics, literary studies, linguistic studies	1,65		2,0	1,7
Biology and biochemistry	1,65	1,9	3,0	1,5

Continuation Table 1

Engineering and engineering activities, Information and communication technologies, Manufacturing and processing technologies	1,65	1,75	3,0	2,05
Architecture and construction, Civil engineering	1,75	2,5	3,0	2,05
Sports sciences	1,75	1,86	-	1,38
Medicine	2,85	2,25	2,5	2,47
Dentistry	4,00	2,25	2,5	2,47
Veterinary medicine	2,85	2,25	5,0	2,47
Agriculture science	1,75	1,75	-	-
Arts	4,0 - 6,0	3-7,5	-	3,0 – 5,0

## Note\*

- The data presented in Table 1 are only to demonstrate the difference in approach to public policies, economic status, different funding potential and strategic directions of different countries.
- The lack of coefficients shows that the corresponding study programs are financed by other methods.

Another way of funding is performance-based funding, which is a way to improve formula-based funding by considering performance specific to the university system. The basis of this funding model is to provide higher funding to high-performing universities, compared to lower-performing universities. Thus, the inclusion and increase of the role of competitiveness in education and research aim to stimulate less performing universities, since the principle of competitiveness promotes the reward of good results. In many countries, the funding mechanism for higher education has changed recently to directly reward success, included in the core funding formula. The model for financing HEIs in *Finland* can be presented as an example.

It is a model that the relevant Ministry has reached through several attempts, but the final decision is in favor of universities that have progressive missions in research and education. The model is geared to the objectives and vision of Finnish universities 2020 to enhance quality performance, deeper internationalization, clearer university profiles, greater efficiency and stronger research impact.

Objectives-based funding is another model of direct funding, for certain specific purposes, which generally corresponds to projects which the authorities consider to be a priority at national level, and which are supported, from the point of view of the implementing directions, by the objectives set at the institutional level. The allocation is made via competition or directly to some institutions, following a negotiation or substantiation of the necessary expenses. Objectives-based funding is often a tool of modern public management, through which universities often co-opt to achieve national policy objectives. In essence, autonomy is ensured in terms of methods of implementing and achieving public policy objectives, but funding is conditional on achieving them. This way of distributing public resources, which sometimes requires co-financing, limits the real autonomy of institutions in spending money [2].

	IMPACT	QUALITY	INTERNATIONALIZATION
EDUCATION – 41%	Master's degree graduates - 14%		International master students – 1%
	Bachelor's degree graduates - 6%		
	Study credits in other study programs -2%	Number of students who have accumulated more than 55 credits – 12%	Student mobility (incoming and outgoing) -2%
		Student survey results – 3%	
	Number of graduates employed – 1%		
RESEARCH – 34%		Doctoral students – 9%	International doctoral students – 1%
		Scientific publications – 13%	International staff engaged in teaching and research – 2%
		Completed research projects – 10%	
OTHER CONSIDERATIONS – 25%		Implementations on strategic development -10%	
		Research to the order of the business environment - 8%	
		National responsibilities – 7%	

**Figure 1.** HEIs funding model in Finland.

Source: TEMPUS project ATHENA, financed by EU, Training seminar on financial management, University of Helsinki, 30 April 2014.

Competition-based funding is used as a way of allocating public funds, based on the fulfilment of pre-established criteria, of selection and evaluation of the capacity and need to perform specific activities, in order to finance them to achieve the specific objectives of the competition. The competition-based funding method is used mainly to finance scientific research, but also investment or institutional development objectives. In addition, due to strong political pressures, mainly due to new public management reforms and decreasing public allocations for higher education, there is a growing trend in many EU countries to distribute financial subsidies for universities through innovative solutions (CHEPS 2010) [2].

Project-based funding usually takes the form of competitions organized by various public administration structures. Project-based funding can be linked to research activity, strengthening administrative capacity, inter-institutional cooperation, etc.

### **Financing strategy of heis in the Republic of Moldova**

In the context of the university reform, the Government of the Republic of Moldova, on June 10, 2020, approved the GD no. 343 „Methodology of budget funding of public higher education institutions” [10]. The purpose of this legislative act is to increase the efficient use and ensure the transparency of the allocation of funding sources from the state budget for the activity of universities. The methodology will be implemented starting with January 1, 2021 in the 16 public higher education institutions with financial autonomy.

The normative act establishes the allocation method for standard financing of public higher education institutions, based on standard cost per student and adjustment coefficients, associated with the degree of complexity of study programs for bachelor's and



master's degree cycles, compensatory funding to support the performance and complementary funding for the modernization of the material and teaching base of the institution.

According to the methodology, the budgetary allocations (except for scholarships, amounts intended for the maintenance of dormitories, allowances for members of strategic development councils, payment of academic mobility, doctoral studies) are divided in the following funding directions:

- standard funding -75%;
- compensatory funding to support the performance in public higher education institutions - 20%;
- complementary funding for the modernization of the material and teaching base - 5%.

Budget allocations for standard funding of higher education institutions include:

- 1) expenses for the salary of the scientific-didactic, scientific, didactic and auxiliary didactic staff, of the research staff involved in the conduct of study programs and other categories of staff, as well as contributions for compulsory social and medical insurance;
- 2) expenses for the purchase of goods, services and works necessary to ensure the conduct of the educational / scientific research process;
- 3) expenses for the procurement of fixed assets for educational and scientific research purposes.

The budget allocations for standard funding, allocated to each public higher education institution for students enrolled in accordance with the state order for bachelor's and master's degree studies, shall be transferred to the institution on the basis of their number of equivalent students. The number of equivalent students is determined by multiplying the physical number of students financed from the state budget of the university by the adjustment coefficients corresponding to the forms of education and the groups for financing the study programs by study cycles. The physical number of students financed from the state budget will be reported on October 1 of the current budget year.

The number of equivalent students, financed from the state budget, for each public higher education institution and each study cycle is calculated according to the following formula:

$$NSE_{c,j}^i = \sum_{t=1}^T f_t \times NS_{f_t,j}^i, \text{ where:}$$

- $NS_{f_t,j}^i$  - the number of physical students in the study cycle  $c$ , the financing group  $j$  with the form of education  $t$ , enrolled in a public higher education institution  $i$  reported on October 1 of the current budget year;
- $f_t$  - the adjustment coefficient according to the form of education and the language of instruction  $t$ ;
- $T$  - is the total number of forms of education financed from the state budget in higher education in the Republic of Moldova.

For each public higher education institution  $i$ , the  $NSE_c^i$  number of equivalent students in each study cycle  $c$  (bachelor ( $c=1$ ) and master ( $c=2$ )) is determined:

$$NSE_c^i = \sum_{j=1}^{Nd} d_{c,j} \times NSE_{c,j}^i, \text{ where:}$$

- $Nd$  - the total number of funding groups of study programs;
- $d_{c,j}$  - the adjustment coefficient of the financing group related to the study cycle  $c$ .

The formula for determining the budget allocation  $P_{se}$  per equivalent student is as

follows:

$$P_{se} = FD/NSE, \text{ where:}$$

- *FD* is the direct budget allocation, and *NSE* is the total number of equivalent students.

The direct budget allocation  $FD_c^i$  for each institution *i* is determined for each study cycle *c*:

$$FD_c^i = P_{se} \times NSE_c^i, \text{ where:}$$

- $P_{se}$  - the allocation amount per equivalent student,
- $NSE_c^i$  - the number of equivalent students of public higher education institutions *i*, enrolled in the study cycle *c*.

The direct budget allocation  $FD^i$  is then determined for each public higher education institution with financial autonomy:

$$FD^i = \sum_{c=1}^2 FD_c^i.$$

Budget allocations for *compensatory funding* are determined on the basis of performance indicators according to the following distinct directions of activity:

- the teaching-learning process (ratio of the number of students in the master's degree cycle and the number of students in the bachelor's degree cycle, the ratio between the number of tenured teachers entitled to doctorate supervision and the total number of tenured teachers);
- university scientific research / artistic performance / sports performance (quality of human resources and funds for scientific research / artistic performance / sports performance);
- the internationalization dimension (outgoing mobilities, incoming mobilities, funds attracted from international projects (except for research ones);
- social orientation (scholarships from university funds, other than those from the state budget, investments in dormitories, other infrastructure objects, provision of internships, places in student dormitories).

*Complementary funding* includes expenses for the improvement of accommodation conditions in dormitories, modernization of the material and didactic base, endowment with computers / software / equipment, as well as coverage of specific expenses for regional universities.

## Conclusions

Thus, the central element of the contemporary financing of higher education institutions from public funds is related to the dependence on funding criteria, institutional accountability procedures and measures, totally in line with the new spirit of public management.

Research shows that a wide range of models are used in European countries to finance HEIs. The general feature noted is that funds intended for the financing of HEIs are calculated on the basis of a formula, which includes both input and output indicators. Formula-based block grants are the main way of financing, but negotiated grants also remain an important financing mechanism.

Block grant allocation indicators based on input indicators list the following indicators: number of students, number of employees, size of university, etc., while exit indicators are more focused on the level of graduation and employability, strategic

development objectives, performance indicators, research publications, research grants, etc. In countries where education funding can be separated from research funding, formula-based funding is used for education, and funding for scientific research is determined through formula and competition.

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