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EXPLORING THE RELATIONSHIP BETWEEN HIGHER EDUCATION FINANCING MECHANISMS AND UNIVERSITY RANKING

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Abstract: According to the World Bank, on average 13% of state budget worldwide goes to education, and a significant portion to higher education, and governments are interested in spending these funds productively. One of the generally accepted criteria for the efficiency of a university is its position in international academic rankings. We discuss the influence of the state financing mechanism of universities on their ranking. And what are the main mechanisms of state financing of universities in the world? We

identified three main mechanisms: financing according to a formula (a-type), performance-based financing (b-type) and financing by negotiations (c-type). We have collected information about the financing mechanisms of universities in different European countries. Based on the results of the analysis, two main groups of universities were formed: those who do not succeed in ranking (with a- and b-type financing mechanisms), and those who lead in ranking (first hundred). Such universities use a c-type financing mechanism either alongside a- and b-types or as the main one. Based on the results, we propose an effective funding mechanism for the Armenian universities.

Keywords: higher education financing mechanisms, university efficiency, financing according a formula, performance-based financing, negotiated financing, Shanghai ARWU ranking, QS ranking, THE ranking

JEL codes: G28, I23, I28

Research aims: To highlight the main financing mechanisms of universities from the state budget, as well as to find the correlation between the financing mechanism and the ranking of the university.

Research novelty: Higher education financing mechanisms have been grouped and divided into three main types. Universities financed by the results of constant negotiations with the government have a higher ranking.

Introduction

In the modern world, one of the key resources for the development of the economy and society is, of course, education, the importance of which is constantly growing. Investments in

education – if they are effective – provide the conditions for the appearance of innovative enterprises, which are the foundation of an innovative national economy in nowadays world. It is for this reason that work has intensified in many countries to create national programs and roadmaps for the development and modernisation of universities.

Now there are discussions on the development of a similar project in Armenia, and recently the government approved the concept of the Academic City (RA Government Resolution on Approving the Concept of the "Academic City" Program). Moreover, according to the state program for the development of education until 2030, it is planned that at least 4 Armenian universities will be among the top 500 universities in the world (RA Law on Approving the "State Program for the Development of Education of the Republic of Armenia until 2030"). On the other hand, we have argued in one of our previous works (Mkhitaryan A., Khachatryan N., 2019) that any doctoral educational programs in Armenia largely depend on the volume of funding from the state budget, as well as on the correct planning of postgraduate places by the relevant Ministry. For example, in Armenia, the creation of one state-funded research university based on the scientific potential of the research institutes of the National Academy of Sciences could have significant importance (Mkhitaryan, A., Begoyan, K., 2022). Is the government ready to invest significant funds for the development of the country's education and science system, are there any ideas about the effectiveness of spending these funds, will the university management principles finally be changed?

Unfortunately, none of the decision-makers at the political level in Armenia have the answers to these questions.

There are numerous university rankings today, they use different calculation methods, but none of them has escaped criticism from the academic community regarding the results presented. Nevertheless, university ranking has become an inevitable reality of higher education systems around the world and are playing an increasingly prominent role in the development of strategies and decisions on the allocation of financial resources (Goglio, V., 2016).

The most significant and authoritative international ratings today are the Shanghai ARWU ranking and the British THE and QS rankings, published from 2004 to 2009 in the form of a single THE-QS ranking. We, in particular, use these rankings to assess the dynamics of the efficiency and competitiveness of universities in the modern market of educational services and scientific research.

Various authors, studying the funding issues of universities, did not find a direct connection between the volume of funding and the university ranking (Auranen O., Nieminen M., 2010). On the other hand, it is important for the government to understand in what volume, in what ways and under what conditions the university should be financed in order to ensure its maximum effectiveness. Therefore, in this study, we focused on public funding mechanisms for universities.

The purpose of this study is to empirically verify whether there is a relationship between state funding mechanisms and university efficiency, which is expressed by the position of the given university in international academic ranking.

Research results

In today's world, the university funding model is not just a set of instruments through which funds are distributed between donors and recipients (which may include the state, students, researchers and faculty), but also a set of mechanisms to achieve certain goals. If public universities dominate the market of educational and scientific services (which is the case in most countries of the world, including Armenia), it is the funding model that is the most important element of the overall strategy of university management.

The following main trends can be identified in the reform of the system of financing higher professional education that is currently taking place in Europe, Asia and America:

1. Transforming the way in which public funds are allocated in the education system. In order to make educational institutions more responsive to the needs of consumers, some funds are channelled to students and enterprises in the form of government subsidised loans or tax credits, and some changes are being made to the mechanisms for allocating direct institutional support. In particular, the funding for teaching and research is being separated; formula funding is becoming more prevalent; and impact is an increasingly important factor in the allocation of funds.
2. Intensive introduction of new technologies of open Internet education or distance education, which objectively reduce the costs associated with the provision of educational services. In the long term, it may lead to the formation of a radically new model of the university.

3. Diversification of funding sources, as well as establishing partnerships with the business community, research centres and organisations. There is a direct correlation between the performance of an educational institution and the amount of private funding attracted. The development of the co-financing model makes it possible, on the one hand, to give more autonomy in the management of financial resources to the institutions themselves and, on the other hand, to improve the quality of spending of the received budget funds.

So, educational activity in modern conditions is financed from the following sources:

- 1) budgetary allocations (state and municipal);
- 2) incomes from paid educational services and related to the educational process (sale of educational materials, provision of accommodation, etc.);
- 3) funding received from companies - fees for organising and conducting professional development programmes and individual training programmes for current and future employees;
- 4) donations, sponsorship, other forms of non-refundable investments by companies and individuals in education;
- 5) voucher system and other mechanisms of state support for paid education;
- 6) other external sources of funding, such as grants from non-profit and international organisations and loans;
- 7) self-financing (funds received from the provision of non-core services - publishing, telecommunications, etc.);
- 8) educational credits of students.

In most European countries, the share of public funding dominates in university funding (Chernova E. G., Akhobadze T. D., Malova A. S., Saltan A. A., 2017). See Table 1.

All sources of university funding, except for state funding, have their own institutional mechanisms control over the efficiency of funds allocation. It is relevant to assess the effectiveness of mechanisms for transferring public funds to universities. The following mechanisms for the allocation of public funding were identified by scientists (Privot E. B., Claeys-Kulik A.L., Estermann T., 2015).

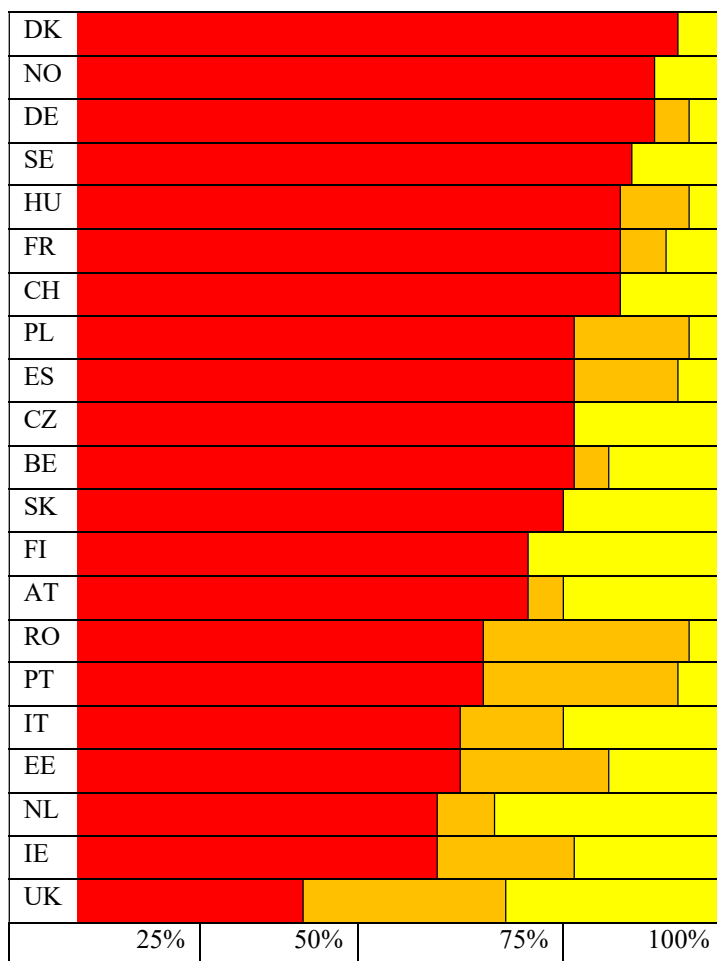
1. Budgetary allocations:
 - a) financing by a formula,
 - b) performance-based financing,
 - c) negotiated funding mechanism.
2. Project funding.
3. Other direct and targeted financing.

Financing according to a formula (a-type, or funding formula) means a mechanism for determining the amount of university financing using a mathematical formula. This formula includes the number of students, number of publications and other indicators. This financing mechanism allows for taking into account changes over time, for example in the number of students, graduates or staff. Performance-based financing (b-type) is a form of contracting between the university and the government or public authorities. This contract specifies the target indicators, which the university undertakes to achieve by receiving a given amount of funding.

Unlike financing by a formula, it's based on future performance rather than past performance. Thus, performance-based funding

helps universities to move in a given direction. In implementing the performance-based financing mechanism, the goals set for the university may be specific for a given higher education institution and more or less in line with its strategy.

Table 1. Structure of university funding in European countries



Where as:

<i>State funding</i>	
<i>Students' tuition fees</i>	
<i>Other income</i>	

But it may be a consequence of the broader goals of the higher education system and the research policy of the state. Targets can be characterised as outcomes to be achieved, leaving it to the university to decide how and which specific actions to be taken within a certain period of time. Objectives can be formulated qualitatively (e.g., to promote equal access of men and women to leading academic positions) or quantitatively (e.g., increase the number of women professors). Depending on the nature of the goals and objectives, the procedure for assessing the achievements can differ: it may take the form of discussions between the state and the university while in other situations it may require data collection.

The negotiating mechanism (c-type) refers to the historical level of funding as well as all possible informal negotiating mechanisms that are used. This mechanism, on the one hand, is the most non-transparent of those considered, and on the other hand, it allows to take into account the specific features of the university, in particular its reputation, which is rather difficult to quantify and therefore cannot be included in the other two mechanisms. These funding mechanisms can be used to support both educational and research activities. They can be used either separately or in combination. The main funding mechanism is usually one of them and one of them is an additional one.

The main idea of the study is to compare the financing mechanism with its position in the rankings. We used the data of the DEFINE project, dedicated to the analysis of existing funding mechanisms for universities in Europe and opportunities to improve their efficiency (Pruvot E., B., Claeys-Kulik, A., L., Estermann, T. (2015). We have collected information about the European universities that have been included in the rankings for the last 10 years. Specifically, we tried to find the following information:

- ✓ the amount of funding for the university as a whole;
- ✓ the share of state funding;
- ✓ volume of funding for teaching and research;
- ✓ volume of funds raised from third parties for research;
- ✓ volume of tuition fees;
- ✓ the number of students studying at the university;
- ✓ the number of staff employed at the university and the proportion of academic staff;
- ✓ presence of centres of excellence at the university.

Then we grouped this information concerning to each university: the main financing mechanism (from the state budget) and the university's position in the rankings 4, 5 & 6. Based on the results of the analysis, three groups were identified, which are described in Table 2.

In the first group we have mainly the universities from the top 100 in the rankings. This group of universities is characterised by the use of c-type as the main mechanism. Financing mechanism according to a formula (a-type) is mainly used as a secondary mechanism. Teaching at this group of universities is financed

primarily according to a formula and partly on the basis of a negotiating mechanism (c-type). The second group is dominated by universities from the second hundred of the rankings.

They are typically characterized by formalized financing mechanisms, namely a-type financing as primary and b-type as a secondary one. This group of universities either uses c-type financing as a secondary mechanism or does not use it at all. In the third identified group we have universities from the third, fourth or fifth hundred of rankings. These universities do not use a negotiation mechanism in general, they are characterized by formal financing mechanisms (a- and b-types).

Table 2. Descriptive characteristics of university groups

		Group 1	Group 2	Group 3
Position in ranking	First hundred	47 %	11 %	0 %
	Second hundred	19 %	64 %	0 %
	Third hundred	20 %	17 %	29 %
	Forth hundred	14 %	8 %	21 %
	Fifth hundred	0 %	0 %	50 %
Dynamics in the ranking (%)	The position has improved	7	11	29
	The position has not changed	74	53	49
	The position has regressed	19	36	22
Amount of funding (mln €)	Total funding per student	0,03	0,02	0,018
	Total amount of funding	705	541	317
	State funding per student	0,02	0,01	0,009
Proportion of selected sources in the total funding (%)	Share of public funding in the total funding of the university	60	49	49
	Share of public funding for research of public funding for research in the volume of public funding	55	48	50
	Proportion of public funding of public funding for teaching in the volume of public funding	45	52	50
	Share of tuition fees in the total volume of funding university funding	24	28	36

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**ԲԱՐՁՐԱԳՈՒՅՆ ԿՐԹՈՒԹՅԱՆ ՖԻՆԱՆՍԱՎՈՐՄԱՆ
ՄԵԽԱՆԻԶՄՆԵՐԻ ԵՎ ՀԱՄԱԼՍԱՐԱՆՆԵՐԻ
ՎԱՐԿԱՆԻՇՆԵՐԻ ՄԻՋԵՎ ԿԱՊԻ ՄԱՍԻՆ**

Ատոմ Մխիթարյան

Գիտությունների ազգային ակադեմիա, ԳԿՄԿ դեկան,
ֆիզ.-մաթ.գ.թ., մանկավ. դոցենտ

Ռիմանտա ժելվիս

Վիլնյուսի համալսարան, Կրթության քաղաքականության
կենտրոնի ղեկավար, մանկավ.գ.դ., պրոֆ.

Բանալի բառեր - բարձրագույն կրթության ֆինանսավորման մեխանիզմներ, համալսարանի արդյունավետություն, ֆինանսավորում ըստ բանաձևի, արդյունքահեն ֆինանսավորում, բանակցային ֆինանսավորում, Շանհայի ARWU վարկանիշ, QS վարկանիշ, THE վարկանիշ

Համաշխարհային բանկի տվյալներով՝ ամբողջ աշխարհում պետական բյուջեի միջինը 13%-ը ուղղվում է կրթությանը, իսկ դրա զգալի մասը՝ բարձրագույն կրթությանը, և կառավարությունները շահագրգռված են այդ միջոցներն արդյունավետ ծախսելու հարցում: Համալսարանի արդյունավետության լայնորեն ընդունված չափանիշներից մեկը նրա դիրքն է միջազգային ակադեմիական վարկանիշներում:

Հոդվածում ուսումնասիրվել են բուհերի պետական ֆինանսավորման մեխանիզմի ազդեցությունը համալսարանների վարկանիշի վրա: Իսկ որո՞նք են բուհերի պետական ֆինանսավորման հիմնական մեխանիզմներն աշխարհում: Առանձնացվել են ենք երեք հիմնական մեխանիզմ՝ ֆինանսավորում ըստ բանաձևի (a-տիպ), արդյունքահենք ֆինանսավորում

(b-տիպ) և ֆինանսավորում բանակցությունների հիման վրա (c-տիպ):

Հոդվածում ներկայացված են եվրոպական տարբեր երկրների համալսարանների ֆինանսավորման մեխանիզմների վերաբերյալ տվյալներ: Վերլուծության արդյունքներով առանձնացվել են բուհերի երկու հիմնական խումբ՝ վարկանիշի առումով մեծ հաջողություն չգրանցած (a և b տիպի ֆինանսավորման մեխանիզմներով) և վարկանիշի առաջատարներ (առաջին հարյուրյակում ընդգրկվածներ): Վերջինները հիմնականում կիրառում են c-տիպի ֆինանսավորման մեխանիզմ՝ երբեմն այն համադրելով a- և b-տիպերի հետ: Ստացված արդյունքների հիման վրա առաջարկվում է հայկական համալսարանների ֆինանսավորման արդյունավետ մեխանիզմ:

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