

# Revenue Sources in the Budgets of Public Higher Education Institutions. An Empirical Examination of Financial and Non-Financial Performance Criteria

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## Abstract

*In the case of public higher education system, revenue generation has been and still is an issue addressed both nationally and internationally. Specifically, dependence on a single source of funding can cause financial instability at public universities. Therefore, strategic management at the level of educational institutions should aim at attracting sources of income other than those generated by state budget subsidies, and their use under conditions of financial autonomy can ensure the achievement of the objectives proposed by the institutional strategic plan. By identifying a model of comparative indicators at university level, appropriate information can be provided that reflects reality and provides applicable recommendations. Putting these aspects together, the aim of the present research is to investigate the performance criteria – financial and non-financial – that underpin the rationale and execution of the budget within the public higher education system. The opinions of over 130 academics and administrative members from more than ten universities were analysed through questionnaires in order to bring to the fore how they perceive the relationships between financial and non-financial performance criteria in the budgeting process. The empirical investigation intended to answer the following research questions: Which financial and non-financial performance criteria related to budgeting and budget execution are given more importance by teaching and administrative staff in the public higher education system? How do academics and administrative staff view the budgeting and implementation at their own institutions (effective, efficient or rather high performing)? Are there significant differences between the reports of different categories of subjects (with different hierarchical positions within higher education institutions) on financial and non-financial performance criteria and on the effectiveness, efficiency and performance of budgeting and budget execution at the level of their own institutions?*

**Keywords:** budget, financial and non-financial performance criteria, effectiveness, efficiency, public higher education system

**JEL classification:** I22, I23, I25, G31, H75, C83

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## 1. Introduction

Budgets are communication tools because they highlight both the operational and financial objectives of the moment. Budgets also communicate to senior and middle management what top management's expectations are and communicate management's priorities (profit, market conquest, company image, employee relations,

etc.) to lower levels of management (Bufan, 2013; Van der Stede, 2014). For example, the sales plan and the manufacturing plan are coordinated with each other so that demand and capacity can be brought into line. These plans are then passed on to the finance function, which uses them to manage funds and finance the necessary investments. In turn, these plans are used to achieve the desired results. Last but not least, budgeting facilitates monitoring by senior management. This monitoring takes the form of budget reviews, during which plans are examined, discussed and authorised before any action is taken. However, once the budget is authorised, the responsible manager is obliged to make the budget a priority and work towards achieving its objectives.

Revenue generation in public institutions has been and continues to be an issue addressed both nationally and internationally (Chirica, 2023; Parker *et al.*, 2023). Specifically, dependence on a single source of funding can cause financial instability at public universities. Therefore, strategic management at the level of educational institutions should aim at attracting sources of revenue other than those generated by state budget subsidies, and their use under conditions of financial autonomy can ensure the achievement of the objectives proposed by the institutional strategic plan (Păunică & Tănase, 2014; Piroi & Păunică, 2015). Progressively, ensuring adequate funding has become a central concern for educational institutions. This has led to an increasing emphasis on budgeting processes and the financial performance of these institutions, with modern budgeting techniques and the development of relevant performance indicators becoming central concerns of financial management. In this respect, budgeting has a key supporting role to play in informing decisions, which is why two questions arise (Lewis & Hildreth, 2011): What makes a good budget? and How do we distinguish a good budget from a less good budget?

Based on these issues, the aim of this paper is to investigate the performance criteria – financial and non-financial – that underpin the rationale and execution of the budget within the public higher education system. The specific objectives cover the investigation of the main financial and non-financial performance criteria (from the revenue perspective) that should be the basis for the budget justification and execution in the public higher education system from the point of view of teaching and administrative staff and subjects' perception of the effectiveness, efficiency and performance of budget planning and execution at the level of their own institutions. Moreover, the investigation aims at investigating the differences in reporting between various categories of subjects (with different hierarchical positions within higher education institutions) on both financial and non-financial performance criteria and on the effectiveness, efficiency and performance of budgeting and budget execution.

To achieve its goal, the paper is divided into three main sections. A literature review is advanced followed by methodological considerations and afterwards the empirical analysis is conducted. The paper ends with conclusions, multilevel implications and limitations of the research.

## **2. An overview of revenue sources in the budgets of public higher education institutions**

The higher education system management must guarantee an optimal environment for teaching and research, despite obstacles from burdensome regulations and bureaucratic demands. Pruvot and Estermann (2012) emphasize the importance of management in education for upholding the equilibrium of public accountability, society and institutional autonomy. With a capable staff and well-defined strategic objectives, any contemporary university may effectively utilise the Strategic Institutional Development Plan and the Single University Budget, two crucial management instruments. The Strategic Institutional Development Plan connects university autonomy with financial and administrative management, enabling the establishment of a value system within the organisation and the implementation of the Single Budget, which ensures financial equilibrium (Stancu *et al.*, 2011). The revenue and expenditure budget are expanded by incorporating various resources to enhance performance.

Discovering additional funding sources for the complete educational process is a significant challenge for universities, but it can enhance their competitiveness on both national and worldwide scales. The diversification of financing sources in the income and expenditure budget of public higher education institutions is a topic

contested internationally, which is evident in the continued concerns of relevant bodies. The European University Association (EUA) shows ongoing interest in influencing policies that promote the advancement of higher education and research at the European university level. According to [Morariu et al. \(2008\)](#), significant alterations and adaptations in organisations have been facilitated by the rapid trend of globalisation in recent years.

[Lewis and Hildreth \(2011\)](#) identify certain directions that a budget should follow, including ensuring a balance between income and expenditure, providing the necessary information for policy making at the entity level, ensuring a high degree of credibility for the beneficiary organisations by presenting clear, accurate, comparable, analysable information. Here, the decision-making elements that underpin effective budgeting can be divided into formal elements, such as the legislative and policy framework at country level, and informal elements, which relate to specific habits or preferences at institutional level. At the same time, the way revenue and expenditure budgeting is developed and based differs from one country to another, and is directly influenced by a number of specific factors presented in Figure 1.

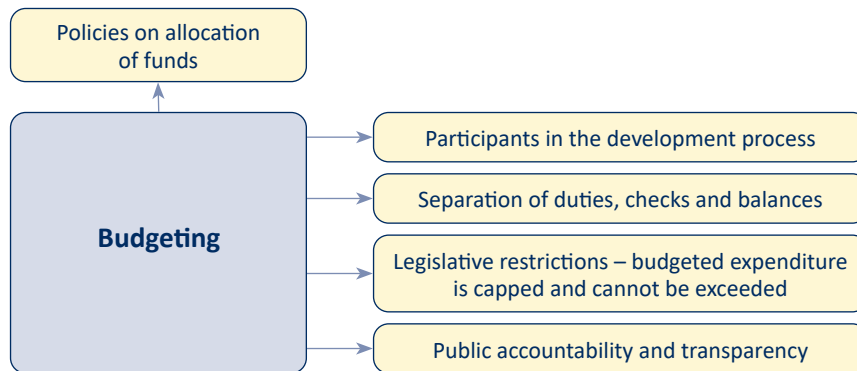


Figure 1. Budgetary estimates of revenue and expenditure

Source: Adapted from [Lewis and Hildreth, 2011](#), p. 83.

According to [Andreescu et al. \(2009\)](#), the sustainable development of higher education institutions relies on maintaining a balance between strategic goals, responsible funding sources and establishing performance criteria in academic, financial and managerial aspects to achieve objectives efficiently, effectively and economically. It is necessary to identify effective benchmarks that can be put into practice and enhanced. Meek & Van der Lee (2005, p. 13) as referenced by [Andreescu et al. \(2009\)](#) argue that benchmarking requires the cooperation of institutional leaders, including financial support, and the collaboration of all participants in the process.

Benchmarking, created in the private sector, is not easily applicable to public institutions due to the differing operational mechanisms of the two systems. Strategic objectives in the private sector are shaped by market competition, focusing on meeting consumer needs and achieving profitability, as indicated in a study by the [OECD \(1997\)](#). On the other hand, public organisations, including educational institutions, prioritise offering public educational services rather than profit generation.

To achieve organisational goals, a strategic plan outlining the steps to reach the desired objectives must be developed. Plans should be developed by assessing the benefits to be gained with the aim of minimising costs. The budget should align with the organization’s goals. Proper budgeting, along with suitable budget policies and guidelines, is essential to prevent resource wastage and failure to meet expectations.

Performance budgeting has a more lenient attitude towards the connection between budget distribution and organisational performance. It acknowledges that issues including management’s political priorities, policy concerns and financial restraints can also play a significant role in determining how money are distributed among programmes and departments. It considers performance information as a component of the data used

in the budget process. The approach aligns with performance budgeting dialogue theory, which views the budget process as an exchange and interpretation of information characterised by ambiguity, subjectivity, uncertainty and deliberate use of information resources. The budget process is viewed as a process involving the exchange and interpretation of information ([Moynihan, 2008](#)).

Performance reporting budgeting does not aim to connect performance outcomes with financial allocation. Performance information, including targets and results, is reported and presented following the performance budgeting technique. However, it is not meant to be utilised by policymakers and managers in the budgeting process and is only seldom used by them. An analysis of the factors influencing and hindering performance budgeting from a multi-level institutional viewpoint. It is crucial to analyse why certain governments effectively utilise performance budgeting as a decision-making tool, while others merely go through the motions without seeing any substantial impact on their budget outcomes. Given the current pressure on many nations to implement austerity measures and the need for agencies to achieve more with limited resources, it is surprising that policymakers are not utilising performance-based budgeting more extensively to justify spending.

### 3. Methodology

#### 3.1. Research aim and objectives

The purpose of this research is to investigate the performance criteria – financial and non-financial – that underpin the rationale and execution of the budget within the public higher education system. The subsumed research objectives are: **O1** – investigation of the main financial performance criteria (from a revenue perspective) that should underpin the budget rationale and execution in the public higher education system in the view of teaching and administrative staff; **O2** – investigation of the main non-financial performance criteria (from a revenue perspective) that should underpin the rationale and execution of the budget in the public higher education system in the view of teaching and administrative staff; **O3** – survey the perception of the teaching and administrative staff on the effectiveness, efficiency and performance of budget planning and execution at the level of their institutions; **O4** – investigate the differences between the reports of different categories of subjects (with different hierarchical positions within higher education institutions) regarding: **O4.1** – financial and non-financial performance criteria, and **O4.2** – the effectiveness, efficiency and performance of budget formulation and execution at the level of their own institutions.

#### 3.2. Research questions

Based on the above research objectives, the following research questions were formulated for testing: **RQ1** – Which financial performance criteria related to budget formulation and implementation do the teaching and administrative staff of the public higher education system attach greater importance to? **RQ2** – Which non-financial performance criteria related to budget formulation and execution do the teaching and administrative staff of the public higher education system attach greater importance to? **RQ3** – How do teachers and administrative staff rate the budgeting and implementation at their own institutions (effective, efficient or rather high performing)? **RQ4** – There are significant differences between the reports of different categories of subjects (with different hierarchical positions within higher education institutions) regarding: **4.1** – financial and non-financial performance criteria, and **4.2** – the effectiveness, efficiency and performance of budget formulation and implementation at the level of their own institutions.

#### 3.3. Research method and technique

The employed research method used in the present paper is the questionnaire survey, which provides more general knowledge of specific characteristics of a sample or target population. Following [Popa's \(2008, p. 40\)](#) guidelines, sampling was by convenience, the availability of respondents being extremely important for the conduct of the research.

The survey was conducted from 3 to 15 January 2023, the sample comprising 131 subjects, teaching and administrative staff from the public higher education system. The contacting of subjects was operationalized through direct invitations sent by the authors to their network of contacts, as well as by facilitating the online distribution of the research tool by professors from different faculties and universities to peer groups. The majority of subjects initially received an email invitation to participate in a study on budgeting in the public higher education system, and were assured that all identifying data would remain anonymous and that the reporting of results would be done in an aggregated manner. After agreeing to participate in the study, study participants completed a self-administered questionnaire online, accessible at [https://docs.google.com/forms/d/1BBtn3hM-F10mg3dsbYeLeI-4oymxu6eLUUp\\_I-5z3eno/edit?ts=63b739f7](https://docs.google.com/forms/d/1BBtn3hM-F10mg3dsbYeLeI-4oymxu6eLUUp_I-5z3eno/edit?ts=63b739f7).

The instrument comprised mostly closed questions – to ensure a high degree of objectivity in categorising responses and to reduce the time taken to complete the questionnaire, subjects were asked to express their agreement with particular statements and to rate them on a Likert scale from 1 to 10, where 1 means “strongly disagree” and 10 means “strongly agree”. The time taken to complete the questionnaire was approximately 10 minutes.

#### 4. Analysis of questionnaire responses

As presented in the methodological section, the empirical study included a quantitative research based on a questionnaire. In this respect, the questionnaire included statements on: financial (revenue-side) performance criteria underpinning the budget formulation and execution in the public higher education system in the view of academic and administrative staff; non-financial (revenue-side) performance criteria underpinning the budget formulation and execution in the public higher education system in the view of academic and administrative staff; effectiveness, efficiency and performance of budget formulation and execution at the level of the institutions from which the respondents come. These were tested through 30 items, two of which were open-ended, allowing subjects to mention other relevant financial and non-financial criteria that were not included in the originally formulated statements.

The socio-demographic data of the 131 respondents who participated in the study are presented in Table 1.

Table 1. Centralisation of socio-demographic data

Socio-demographic data	Frequency	Percent
<b>Participants</b>	<b>131</b>	<b>100</b>
✓ <b>Gender</b>		
Women	80	61.1
Men	51	38.9
✓ <b>Age</b>		
26-35	13	9.9
36-45	24	18.3
46-55	45	34.4
> 55	49	37.4
✓ <b>Length of employment</b>		
1-5 years	12	9.2
6-10 years	11	8.4
11-15 years	20	15.3
16-20 years	25	19.1
> 20	63	48.1

Socio-demographic data	Frequency	Percent
<b>✓ Hierarchical position in the university</b>		
Senior management level	10	7.6
Average management level	46	35.1
Execution level (academic and research)	56	42.7
Executive level (administrative)	19	14.5
<b>✓ Level of qualification</b>		
University studies	9	6.9
Master studies	21	16
Doctoral studies	101	77.1
<b>✓ Doctoral/undergraduate field</b>		
Social sciences (economics, legal sciences, communication sciences, sociology, political sciences, administrative sciences)	90	68.7
Engineering sciences	23	17.6
Natural sciences	3	2.3
Humanities	2	1.5
Other	13	9.9
<b>✓ University</b>		
National University of Political Studies and Public Administration (SNSPA), Bucharest	49	37.4
Bucharest University of Economics Studies (ASE)	11	8.4
University of Agronomic Sciences and Veterinary Medicine of Bucharest (USAMV)	10	7.6
“Alexandru Ioan Cuza” University of Iași	6	4.6
“Babeș-Bolyai” University of Cluj-Napoca	5	3.8
University of Craiova	4	3.1
“Dunărea de Jos” University of Galați	4	3.1
“Vasile Alecsandri” University of Bacău	4	3.0
Other universities in the country (less than four respondents each)	38	29.1

In order to analyse the importance given by the questioned subjects to each financial performance criterion, the arithmetic means for each criterion proposed by the authors were calculated using SPSS. The results were illustrated in Table 2.

Table 2. Centralisation of responses on financial performance criteria (averages)

No.	Items	N		Medium	Standard deviation	Min	Max
		Valid	Absent				
CF1	Ratio of own tax revenue to core funding (last 5 years)	131	0	6.68	2.444	1	10
CF2	Ratio of own income (research, projects, consultancy) to core funding (last 5 years)	131	0	7.00	2.194	1	10
CF3	Ratio of financial resources obtained by leveraging research to third parties to core funding (last 5 years)	131	0	6.42	2.427	1	10
CF4	Existence of sustainable sources of funding (last 5 years)	131	0	7.15	2.304	1	10
CF5	Budget execution situation (last 5 years)	131	0	7.50	2.069	1	10
CF6	Existence of studies on attracting funding sources (last 5 years)	131	0	6.74	2.292	1	10
CF7	Existence of income and expenditure centres (last 5 years)	131	0	6.76	2.396	1	10

No.	Items	N		Medium	Standard deviation	Min	Max
		Valid	Absent				
CF8	Existence of a cost management system (last 5 years)	131	0	7.49	2.153	1	10
CF9	Existence of performance-based remuneration policies	131	0	7.56	2.364	1	10
CF10	Ratio of number of foreign students to total number of university students for the 3 Bologna cycles (%)	131	0	6.09	2.451	1	10

As can be seen in the table above, five of the 10 proposed criteria scored an average of at least 7, which means moderate agreement. Thus, the highest scores were recorded by: CF9 – existence of pay policies based on performance criteria (M = 7.56, SD = 2.364), CF5 – status of budget execution (last 5 years) (M = 7.5, SD = 2.069), CF8 – existence of a cost management system (last 5 years) (M = 7.49, SD = 2.153), CF4 – existence of sustainable funding sources (last 5 years) (M = 7.15, SD = 2.304) and CF2 – the ratio of own income (research, projects, consultancy) to core funding (last 5 years) (M = 7, SD = 2.194).

In an overall approach, the vast majority of academics consider financial performance criteria as relevant for the budget foundation and execution in the public higher education system. At this level, the existence of remuneration policies based on performance criteria, the state of budget execution and the existence of a cost management system (last 5 years) are seen as the most important criteria, while the ratio of number of foreign students to number of total university students for the 3 Bologna cycles (%), the ratio of financial resources obtained by leveraging research to third parties to core funding (last 5 years) and the ratio of own fee income to core funding (last 5 years) are perceived as the least relevant for budget substantiation and execution in the public higher education system.

In order to illustrate more accurately the responses received on each financial performance criterion, the scores were summed across three main categories (disagree – covers scores between 1 and 4 inclusive, neutral – 5 and agree covers scores between 6 and 10). Thus, the distribution of subjects’ responses on the financial performance criteria is shown in Figure 2.

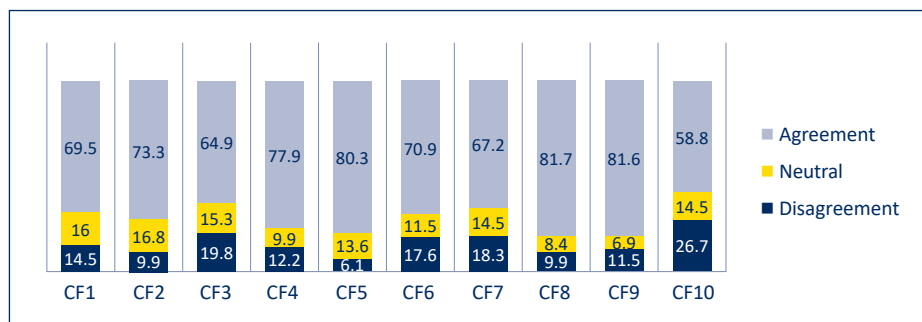


Figure 2. Distribution of subjects’ responses on financial performance criteria (%)

As can be seen in the figure above, three criteria scored at least 80% agreement, i.e. CF8 – existence of a cost management system (last 5 years) (81.7%), CF9 – existence of remuneration policies based on performance criteria (81.6%) and CF5 – budget execution situation (last 5 years) (80.3%). In terms of neutral responses, the highest percentages were recorded by CF2 – the ratio of own income (research, projects, consultancy) to core funding (last 5 years) (16.8%) and CF1 – the ratio of own fee income to core funding (last 5 years) (16%).

In order to analyse the importance given by the subjects to each non-financial performance criterion, the arithmetic means for each criterion proposed by the authors were calculated using SPSS. The results were illustrated in Table 3.

Table 3. Centralisation of responses on criteria non-financial performance (average)

No.	Items	N		Medium	Standard deviation	Min	Max
		Valid	Absent				
CNF1	Degree of execution of the university strategy (last 5 years)	131	0	7.78	1.688	3	10
CNF2	Existence of opportunity studies on the development of existing programmes (bachelor and master) (last 5 years)	131	0	7.56	1.828	2	10
CNF3	Existence of opportunity studies on the initiation of new bachelor and master programmes (last 5 years)	131	0	7.60	1.855	2	10
CNF4	Evolution of the number of students for each study programme	131	0	6.97	2.141	1	10
CNF5	Existence of school drop-out surveys (last 5 years)	131	0	7.52	2.106	1	10
CNF6	Labour market insertion rate of graduates for each degree programme (last 5 years)	131	0	7.77	1.774	1	10
CNF7	Rate of own bachelor's graduates attending master's degree (last 5 years)	131	0	6.98	2.118	1	10
CNF8	Ratio of the number of teachers to the number of other employees (last 5 years)	131	0	7.34	2.280	1	10
CNF9	Degree of support for creativity in the teaching process	131	0	8.03	1.980	1	10
CNF10	Orientation towards a culture of quality teaching	131	0	7.22	2.305	1	10
CNF11	The existence of competitive strategies in the education market	131	0	7.69	1.984	1	10
CNF12	Number of external economic and social partners with which the university collaborates	131	0	7.13	2.312	1	10
CNF13	Number of centres set up as a result of applied scientific research	131	0	7.19	2.254	1	10
CNF14	Quality of staff training programmes	131	0	7.09	2.319	1	10
CNF15	Efficiency of the external economic relations department	131	0	7.74	1.830	2	10

As can be seen in the table above, 13 of the 15 proposed criteria scored an average of at least 7, which means moderate agreement, while one of them scored an average above 8, indicating strong adherence of the subjects to criterion CNF9 – degree of support for creativity in the teaching process ( $M = 8.03$ ,  $SD = 1.98$ ). Following this, the most relevant criteria in the respondents' opinion were: CNF1 – the degree of execution of the university strategy (last 5 years) ( $M = 7.78$ ,  $SD = 1.688$ ), CNF6 – the rate of insertion of graduates in the labour market for each degree programme (last 5 years) ( $M = 7.77$ ,  $SD = 1.774$ ), CNF15 – effectiveness of the external economic relations department ( $M = 7.74$ ,  $SD = 1.83$ ), CNF11 – existence of competitive strategies in the educational market ( $M = 7.69$ ,  $SD = 1.984$ ) and CNF3 – existence of opportunity studies on the initiation of new bachelor's and master's degree programmes (last 5 years) ( $M = 7.6$ ,  $SD = 1.855$ ).

At the other end of the scale, there were several criteria that scored below the threshold of 7, namely CNF4 – evolution of the number of students for each study programme ( $M = 6.97$ ,  $SD = 2.141$ ) and CNF7 – the rate of own graduates of bachelor's studies who are pursuing master's degree programmes (last 5 years) ( $M = 6.98$ ,  $SD = 2.118$ ). According to the reports of the academic members, these two non-financial performance criteria should be the least used for budget justification and execution in the public higher education system. It is worth noting that there were non-financial criteria that did not obtain any score of 1, the minimum being 2 (CNF2 – existence of opportunity studies on the development of existing (bachelor's and master's degree) programmes (last 5 years), CNF3 – existence of opportunity studies on the initiation of new bachelor's and master's



degree programmes (last 5 years) and CNF15 – effectiveness of the external economic relations department), respectively 3 (CNF1 – the degree of execution of the university strategy (last 5 years)).

In order to illustrate more accurately the responses received on each non-financial performance criterion, the scores were summed across three main categories (disagree – covers scores between 1 and 4 inclusive, neutral – 5 and agree covers scores between 6 and 10). Thus, the distribution of the subjects’ responses on the non-financial performance criteria is shown in Figure 3.

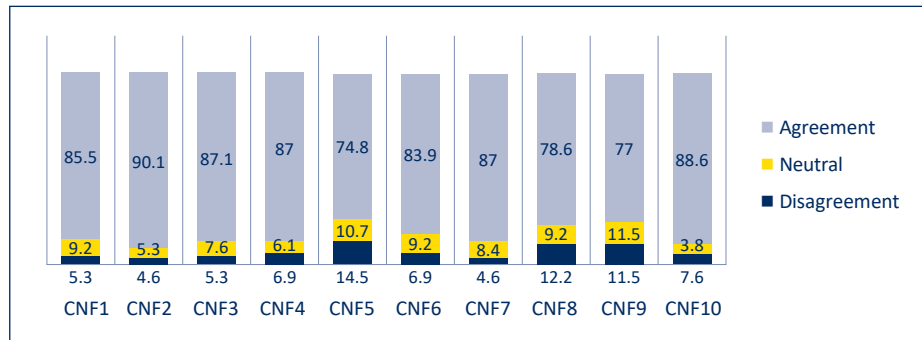


Figure 3. Distribution of subjects’ responses on non-financial performance criteria (%)

As can be seen in the figure above, one non-financial criterion accounted for more than 90% of the positive reports of the subjects surveyed, namely CNF2 – existence of opportunity studies on the development of existing (bachelor’s and master’s) programmes (last 5 years). This is closely followed by other criteria which were validated as relevant by more than 85% of the survey participants, namely: CNF10 – orientation towards a culture of quality in teaching (88.6%), CNF3 – existence of opportunity studies on the initiation of new bachelor’s and master’s degree programmes (last 5 years) (87.1%), CNF4 – evolution of the number of students for each study programme (87%), CNF7 – the rate of own graduates of bachelor’s degree programmes pursuing master’s degree programmes (last 5 years) (87%) and CNF1 – the degree of execution of the university strategy (last 5 years) (85.5%).

At the opposite, but with extremely high scores (more than 70% of subjects agreeing) is CNF5 – existence of school drop-out surveys (last 5 years) (74.8%), CNF9 – the degree of support for creativity in the teaching process (77%) and CNF8 – the ratio of the number of teachers to the number of other categories of employees (last 5 years) (78.6%). Most neutral reports, over 10%, were obtained on CNF9 – the degree of support for creativity in the teaching process (11.5%) and CNF5 – existence of school drop-out studies (last 5 years) (10.7%).

As stated in the methodological section, the questionnaire also included two open-ended items in which academics were invited to propose other financial and non-financial performance criteria that they felt were highly relevant and which were not included in the list proposed by the authors.

At this level, the majority of respondents did not specify criteria other than those that had been proposed. However, some financial and non-financial criteria were mentioned which are worth highlighting. The first category – financial performance criteria – includes: easy access to the budget made available to doctoral students for participation in conferences, number of fee-paying students, budgeted lines with significant variation from the budgeted level, ROA, ROE, deviations of maximum 10% from the budget, degree of reduction of outstanding receivables and payments, courses in procurement, non-recovery of costs in case of employment abroad, report on the evolution of costs with purchases necessary to run the activity in optimal conditions, the ratio of income from national research projects to total research income (including external funds), the existence of strategies for optimising expenditure in relation to the needs of the university’s current activities, the ratio of students to teaching staff, the percentage of graduate employment in the field of study.

The second category – non-financial performance criteria – highlights: European projects, adopted policies, national and international partnerships, career development centres for students, use of digital tools, quality of research, attractiveness of programmes, non-financial motivation of staff, degree of satisfaction, administrative staff of student support services, number of foreign teaching staff out of the total teaching staff, number of scientific articles published (in indexed journals) out of total teaching staff, average salary level of graduates, number of students who benefited from mobility abroad out of total students, number of students from disadvantaged backgrounds out of total students.

As can be seen, the range of proposals is quite wide, but they were mentioned by less than 25% of the respondents, the vast majority of whom implicitly considered the performance criteria proposed by the authors to be sufficient.

The last set of questions in the questionnaire – apart from the socio-demographic ones – concerned the perception of the subjects regarding the way the budget is planned and executed at the level of their own institutions in terms of three indicators: effectiveness, efficiency and performance, as defined in the theoretical section of the paper. Table 4 illustrates the averages for each indicator.

Table 4. Centralisation of effectiveness, efficiency and performance responses (averages)

Items	N		Medium	Standard deviation	Min	Max
	Valid	Absent				
Effective (achievement of objectives and relationship between projected and actual results)	131	0	6.01	2.312	1	10
Efficient (achieving maximum possible results with a given level of resources or less)	131	0	6.02	2.332	1	10
Performance (achieving outstanding results in an activity and their maximum impact in terms of resources that are allocated and consumed)	131	0	5.99	2.251	1	10

As can be seen in the table, the scores on the three indicators are very close, with efficiency having the highest mean ( $M = 6.02$ ,  $SD = 2.332$ ). The scores are in the area of slight agreement marked by the threshold of 6, with the range of responses from 1 to 10.

As regards the distribution of the subjects’ responses on the effectiveness, efficiency and performance indicators across the three categories – agree, neutral, disagree – it can be seen that the distribution of responses is also very similar (Figure 4).

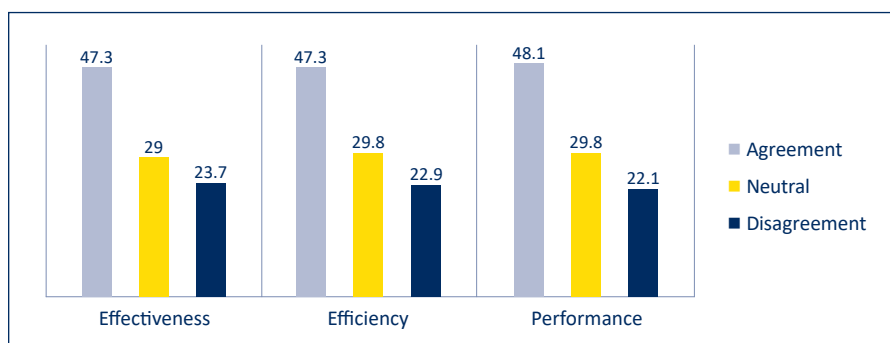


Figure 4. Distribution of the subjects’ responses on effectiveness, efficiency and performance indicators

This situation can be explained by the subjects’ inability to make a fine distinction between the three indicators or by a poor knowledge of how the budget is managed at the level of the institutions where they are affiliated.

In order to investigate the existence of statistically significant differences between the agreement expressed towards the proposed criteria by different categories of academic members, an inferential analysis test was used, namely *Analysis of variance* (ANOVA), comparing the means of two or more groups of subjects varying according to a single independent variable. Since the dependent variable must be continuous (range or ratio), arithmetic means of the scores on all financial and non-financial performance criteria were calculated.

Thus, a first analysis was carried out to determine whether there were statistically significant differences between the reports on the proposed criteria of the four categories of subjects: senior management level (rector, senate president, pro-rector, senate vice-president, general administrative director, economic director, investment director, etc.), middle management level (dean, department director, head of study programme, etc.), executive level (teaching and research) and executive level (administrative). For this purpose, the Levene Test of Homogeneity of Variants was selected (see Table 5).

Table 5. Variant Homogeneity Test – Levene Test

	Levene statistics	df1	df2	Sig.
Average financial criteria	1.195	3	127	.314
Average non-financial criteria	1.829	3	127	.145

Because the Levene’s test is not significant, the post hoc “Equal variances assumed” option was chosen, i.e. Tukey’s HSD test (see Tables 6, 7 and 8).

Table 6. Aggregate results of ANOVA application

		Sum of squares	df	Mean square	F	Sig.
Average financial criteria	Between groups	8.276	3	2.759	.938	.424
	Within groups	373.415	127	2.940		
	Total	381.691	130			
Average non-financial criteria	Between groups	25.689	3	8.563	4.111	.008
	Within groups	264.503	127	2.083		
	Total	290.192	130			

Following the application of the One-Way ANOVA test, a significant difference was found between the categories of subjects only in terms of non-financial performance criteria (Sig. = .008). For financial performance criteria, Sig. is greater than 0.05, i.e. 0.424, so the differences are not statistically significant. This implies that there are no significantly different opinions between subjects at the top management level (rector, senate president, pro-rector, senate vice-president, administrative general manager, economic director, investment director, etc.), middle management level (dean, department director, study program manager, etc.), executive level (teaching and research) and executive level (administrative).

In terms of non-financial performance criteria, as shown in Table 6,  $F(3, 127) = 4.111, p < .01$ . Tukey’s HSD test was used to find out the nature of the differences between the categories of subjects.

Table 7. Averages obtained by categories of subjects

Descriptive analysis									
		N	Medium	Standard deviation	Standard error	95% confidence interval for mean		Min	Max
						Lower limit	Upper limit		
Average financial criteria	Senior management level	10	6.2800	1.56262	.49414	5.1622	7.3978	3.50	8.20
	Average management level	46	6.8022	1.58500	.23370	6.3315	7.2729	2.70	10.00
	Execution level (academic and research)	56	7.0482	1.86255	.24889	6.5494	7.5470	3.60	10.00
	Executive level (administrative)	19	7.2947	1.62599	.37303	6.5110	8.0784	2.60	9.70
	Total	131	6.9389	1.71350	.14971	6.6427	7.2351	2.60	10.00
Average non-financial criteria	Senior management level	10	5.9200	1.46895	.46452	4.8692	6.9708	3.93	8.40
	Average management level	46	7.5116	1.23104	.18151	7.1460	7.8772	4.73	10.00
	Execution level (academic and research)	56	7.6440	1.62934	.21773	7.2077	8.0804	3.93	10.00
	Executive level (administrative)	19	7.4702	1.30969	.30046	6.8389	8.1014	3.53	9.73
	Total	131	7.4407	1.49407	.13054	7.1825	7.6990	3.53	10.00

Table 8. Results by category of ANOVA application

Multiple comparisons – Tukey HSD							
Dependent variable			Difference between averages (I-J)	Standard error	Sig.	95% confidence interval	
						Lower limit	Upper limit
Average financial criteria	Senior management level	Average management level	-.52217	.59829	.819	-2.0797	1.0354
		Execution level (academic and research)	-.76821	.58867	.561	-2.3007	.7643
		Executive level (administrative)	-1.01474	.66991	.432	-2.7588	.7293
	Average management level	Senior management level	.52217	.59829	.819	-1.0354	2.0797
		Execution level (academic and research)	-.24604	.34121	.889	-1.1343	.6423
		Executive level (administrative)	-.49256	.46762	.718	-1.7100	.7248
	Execution level (academic and research)	Senior management level	.76821	.58867	.561	-.7643	2.3007
		Average management level	.24604	.34121	.889	-.6423	1.1343
		Executive level (administrative)	-.24652	.45525	.949	-1.4317	.9387
	Executive level (administrative)	Senior management level	1.01474	.66991	.432	-.7293	2.7588
		Average management level	.49256	.46762	.718	-.7248	1.7100
		Execution level (academic and research)	.24652	.45525	.949	-.9387	1.4317
Average non-financial criteria	Senior management level	Average management level	-1.59159*	.50353	.010	-2.9025	-.2807
		Execution level (academic and research)	-1.72405*	.49544	.004	-3.0139	-.4342
		Executive level (administrative)	-1.55018*	.56381	.034	-3.0180	-.0824

Dependent variable			Difference between averages (I-J)	Standard error	Sig.	95% confidence interval	
						Lower limit	Upper limit
Average non-financial criteria	Average management level	Senior management level	1.59159*	.50353	.010	.2807	2.9025
		Execution level (academic and research)	-.13245	.28717	.967	-.8801	.6152
		Executive level (administrative)	.04142	.39356	1.000	-.9832	1.0660
	Execution level (academic and research)	Senior management level	1.72405*	.49544	.004	.4342	3.0139
		Average management level	.13245	.28717	.967	-.6152	.8801
		Executive level (administrative)	.17387	.38315	.969	-.8236	1.1714
	Executive level (administrative)	Senior management level	1.55018*	.56381	.034	.0824	3.0180
		Average management level	-.04142	.39356	1.000	-1.0660	.9832
		Execution level (academic and research)	-.17387	.38315	.969	-1.1714	.8236

\*. Significance threshold 0.05

The analysis showed that members at the senior management level differed significantly from members at the middle management level ( $M = 5.92$ ,  $SD = 1.468$  versus  $M = 7.51$ ,  $SD = 1.231$ ), members at the executive (academic and research) level ( $M = 5.92$ ,  $SD = 1.468$  versus  $M = 7.64$ ,  $SD = 1.629$ ), and members at the executive (administrative) level ( $M = 5.92$ ,  $SD = 1.468$  versus  $M = 7.47$ ,  $SD = 1.309$ ). The results indicate that the reporting of members at the top management level (rector, senate president, pro-rector, senate vice-president, chief administrative officer, chief economic officer, chief investment officer, etc.) is more moderate in terms of the relevance of non-financial performance criteria than that of members at the middle management level (dean, department director, degree program officer, etc.) and those at the executive level (teaching and research and administrative).

As the calculated averages show, the most favourable report on the appropriateness of using non-financial criteria for budgeting and execution in the public higher education system belongs to members at the executive level (academic and research). This can also be argued in terms of the non-financial criteria that were voted positively by most respondents, i.e. CNF2 – existence of opportunity studies on the development of existing programmes (bachelor and master) (last 5 years), CNF10 – orientation towards a culture of quality in teaching and CNF3 – existence of opportunity studies on the initiation of new bachelor's and master's degree programmes (last 5 years).

## 5. Conclusions, research implications and limitations

Firstly, members of the academic community attach greater importance to financial criteria based on performance-based remuneration policies, the state of budget execution and the existence of a cost management system, and non-financial criteria based on supporting creativity in the teaching process, the degree of execution of the university's strategy and the rate of graduate labour market insertion for each degree programme. As regards performance-based remuneration and the orientation towards a culture of quality, experts in the field consider them to be viable criteria, but at the same time point out that various inadequacies may arise in practice (e.g. the problem of uniform evaluation of the quality of teaching).

Secondly, the categories of academic respondents (senior management level, middle management level, executive level (academic and research) and executive level (administrative)) have significantly different reports in their assessment of non-financial performance criteria and in their assessment of the effectiveness, efficiency and performance of budget formulation and execution at their own institutions. This situation can be explained by several factors, such as different degrees of knowledge versus ignorance on technical issues related to budget setting and execution, personal interest in promoting certain criteria, subjectivity of opinion on issues not of immediate interest, etc.

In terms of practical implications, the investigation facilitated several research avenues. On the one hand, it ensured mapping a specific sector of activity from the perspective of budget rationale and execution, which provides a more in-depth understanding of the sector, its challenges and approaches, and is a starting point for similar research. On the other hand, it complemented the existing literature with new data on the phenomenology of the budgeting and budget execution process in the public higher education system through a double filter, i.e. the filter of experts in the field and members of the academic community.

Further, the paper also makes a significant contribution to organisational practice. As the results obtained show, the expert opinions on budgeting and budget execution in the public higher education system are brought to the fore, as well as the subjective opinions of academic actors, and thus areas of similarity and differentiation in the positions taken by the two categories of stakeholders on the topics addressed are revealed. Moreover, the empirical study differentiates the approaches of different categories of stakeholders. It is noted that academic respondents (senior management level, middle management level, academic and research executive level and administrative executive level) have significantly different reports in assessing non-financial performance criteria and in assessing the effectiveness, efficiency and performance of budget formulation and execution at their own institutions. These issues may open up new avenues for research in the field aimed at identifying a common denominator in order to draw feasible criteria for budgeting and execution in the public higher education system.

Like any other research endeavour, this paper has some limitations that can be addressed in future investigations. A first limitation of the research concerns a small number of participants in the questionnaire survey (131 members of the academic community). Even though the 131 respondents surveyed allowed inferential statistical tests to be run, future research could aim to expand the pool of respondents to make the results more generalisable. In addition, given the convenience sample, respondents come from more than 25 universities across the country, but their distribution is disproportionate (many subjects from some universities and very few from others). The same situation is reflected in the sample structure in that respondents from the administrative executive level are under-represented compared to respondents from the teaching and research executive level. From this angle, future research could target more subjects from the administrative area who are directly involved in issues related to the budget management of each higher education institution.

Another limitation of the research is the use of items in the questionnaire that are aimed at the subjective opinions of respondents rather than objective reporting based on exact figures. Given the issues addressed by this paper and the heterogeneity of the sample, an empirical examination based on reporting and analysis of objective financial statements at the level of several institutions would not have been possible. Therefore, future research could use other methods of analysis to test the efficiency of budget justification and execution at the level of public higher education institutions.

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