The Eurasia Proceedings of
Educational & Social Sciences (EPESS)
ISSN: 2587-1730

The Eurasia Proceedings of Educational & Social Sciences (EPESS), 2017

Volume 8, Pages 52-58

IConSE 2017: International Conference on Science and Education (IConSE)

COMPARISON OF FORMULA FINANCING AND PERFORMANCE-BASED FINANCING METHODS: THE SAMPLE OF HIGHER EDUCATION

Gonca Gungor Goksu
Sakarya University

Mehmet Emin Altundemir
Sakarya University

Abstract: When the financing of higher education service with public resources is examined, it is understood that there are two main allocation methods as traditional and modern. While input criteria are given importance in traditional methods, output and results criteria have precedence in modern methods. Formula financing examined in this study is evaluated among traditional financing methods. On the contrary, performance-based financing is also among modern financing methods. The formulas and various indicators are used in the context of both practices. So the related methods are sometimes confused and perceived as expressing a similar logical framework. However, the two methods differ significantly from each other. In this study, the similar and dissimilar aspects of them are analyzed. Thus, examples are given from higher education service in order to concretize the subject. In this direction, the aim of study is to compare to formula financing and performance-based financing and to comprehensively examine the common features and their differentiating aspects of the related allocation methods.

Keywords: Higher education financing, performance-based financing, formula financing

Introduction

As a concept, the budget that first emerged in western countries and turned into its present state of use as of the 17th century (Tüğen, 2014:1) has been used in various ways until today. Budgeting system that varies by a state's economic, social and political conditions is segmented into two main groups, being traditional and modern. The traditional budgeting methods are divided as negotiated budget, categorical budget, zero budget or formula financing etc. The modern budgeting methods are classified by performance-based budgeting, competition financing, programme budget or performance-based financing etc.

Formula financing which is a type of traditional budget and performance-based financing which is a type of modern budget are sometimes used simultaneously. Upon examining the finance literature, although there are similarities between these two appropriation mechanisms, there are also significant differences. Similar and different aspects of formula financing and performance-based financing methods are emphasised within the scope of this study. Also, usage in higher education is intended to clarify. Thus, examples are given from higher education service in order to concretize the subject. In the first and second parts of study, the theoretical frameworks of formula financing and performance-based financing are studied. The strengths and weaknesses of them are shown in Table 1. In the third part, the comparison of formula financing and performance-based financing is examined. Also, there are similarities and differences between them shown as a whole in the second Table. The method of study is detailed literature review.

- Selection and peer-review under responsibility of the Organizing Committee of the conference

*Corresponding author: Gonca Gungor Goksu- E-mail: ggungor@sakarya.edu.tr

The Theoretical Examination of Formula Financing

Formula financing is a method calculated using funding performance criteria, and is preferred in the field of higher education funding especially in most of EU countries. This method is chosen for the calculation of both of public grants for education-training and R&D (European Commission, 2010:21). In this context, some formulas are used while budgets are determined (Ilyas, 2012:20).

In higher education, the formula financing method foreseen as a tool for allocating the rational and fair distribution of public funds has evolved over time into a complex form that includes multiple objectives and results (Layzell & Caruthers, 1995:6). In formula financing, mathematical formulas are used to calculate funds (Schmidt, 2011:316-317). Funding body transfers appropriations based on the costs of activities. The most common application is to use unit costs as parameters (Ziderman & Albrecht, 1995:33). Also, it provides increased freedom to institutions for deciding allocation of funds between education-training, R&D and other expenditures (Schmidt, 2011:316-317).

Preferred indicators within the scope of the formula might be varied from simple indicators (student, number of staff, etc.) to highly complex indicators (normative cost calculations by disciplines and departments, etc.) (The World Bank, 2010:123). According to formula based allocation, resources are equally divided among higher institutions. So institutions compete to each other, and winners-losers are determined. Thus the performance indicators in formula financing contribute to establish segmented higher education system. Moreover, formula-based allocation is transparent, and operation costs are relatively low (Benneworth & others, 2011:79).

The formula financing is implemented in three ways: (i) Gradually incremental fixed amount of funding, (ii) Formulas based on input indicators, and (iii) Formulas based on output indicators (Leszczensky & others, 2004). Formula financing is perceived to be an assessment tool in order to achieve long-term plans for universities, and also agile to respond environmental conditions. The effects of this financing method are based on the coefficients of input and output indicators.

The most common used measures in financing formulas (Salmi & Hauptman, 2006:10):

i. *Inputs such as staff or students numbers*: Inputs which are related to staff or students are included in formulas. Such as the number of staff or staff salaries...
ii. *Costs per student:* It is formed by actual costs per student, average costs per student and normative costs per student.
iii. *Priority-based funding:* It is used to supply national and regional priorities such as critical labor force needs.

The indicators' coefficients are determined by formulas according to both of the types of programs and institutions. The coefficients encourage the internal distribution of resources. The most commonly used coefficients are work area, education level, institution type and the students' population (Ziderman & Albrecht, 1995:34). Although performance indicators are included in formula, this financing method is not evaluated in the context of performance-based financing. It provides allocation of the resources among universities equally. According to the method, the universities which have more students cannot obtain more public grants. Besides, the effects of political request and intervention are minimum hence considered objective criteria in the allocation of appropriations (The Working Group of Finance Ministry, 2011:11).

Even if a university has more students than estimated, this excess is not included in formula financing (Ilyas, 2012:21). The main advantage of formula financing is that transparency by provided by the distribution of funds because of using objective criteria. So the lobbying activities done by institutions are limited (Schmidt, 2011:317). The method's potential for providing the real costs of an educational activity decreases internal cross-subsidies from more efficient programs to less efficient programs. It also helps for removing unwanted incentives to increase enrollment in low disciplines (The World Bank, 2010:124).

Formula financing generally has the characteristics below (Layzell & Caruthers, 1995:7):

i. More detailed budget categories and elements,
ii. In response to increased accountability requirements, more control and monitoring of the formula stages by executives of higher education institutions and budget staffs,
iii. Being included more non-formula components such as categorical grants for equipment and economic development,
iv. Isolation of formulas from student enrollment changes in response to expected decreases in student enrollments.

There are many good reasons to use formula financing. Firstly, Justice and transparency are the most contributions of formulas. The limit of management based intervention is another noteworthy feature of the formula. Since the implementation of the formula is simple and undistorted after the formula is prepared. The same rules are implemented to all higher education institutions, and negotiations are not separately performed with them (European Commission, 2010:21). In addition to this, higher education institutions which have more performance cannot take more grants. In other words, there are no success criteria. According to method, enrollment more students or efforts towards higher unit cost programs may reduce the service quality of education-training. It may also be given less importance to some training disciplines which have high benefits (The Working Group of Finance Ministry, 2011:11).

The drawbacks of formula financing are below (Demirbaş, 2009:83-84):

i. Hence the number of students are prioritized, the higher performance of universities are not encouraged. Because an institution or program with average success is financed at the same amount for an institution with higher performance.
ii. In this method, having more students may affect the service quality negatively. For balancing the current numbers of students, it may lead to loss education standards.

The Theoretical Examination of Performance-Based Financing

Performance-based financing is identified as a percent of allocations to institutions which depends on the evaluation of performance measurements predetermined (Jordan & Hackbart, 1999:74). Its aim is that more flexibility and autonomy are given to the activities for which executives are responsible to provide efficiency and productivity. Moreover, executives are granted with more authority at the decision-making stages (Alkarann & Jaba, 2011:1136). In order to fund public higher education institutions, performance-based financing is the allocation method which is based on output indicators in the face of changes of the state administration and behaviors (Gorbunov, 2013:19). The method has the relation between performance measurements and financing and focuses on measurable results. It is ultimately based on the concept of accountability (Layzell & Caruthers, 1995:5).

The logic of performance-based financing is that institutions which show high performance gain more financing than institutions which show low performance (Ecker, Leither & Frolich, 2011:2). According to the study of Layzell (1999:240), there are four main characteristics of performance-based one: (i) A global objective for allocations and measurable targets should be determined, (ii) It includes the reports related to the past performance of institution, and it uses the common cost classifications to make comparison, (iii) It reallocates needed funds, and offers management flexibility for punish of failure and reward success, (iv) It includes the periodic evaluation findings which are supported by independently audited and robust information.

The main aim of performance-based financing in education-training is to create incentives for supporting excellence (Ahmad, Saripuden & Soon, 2014:8). Higher education institutions gain the amount of financing already determined based on performance which is as of bonus payment or a share of their budgets (Hillman, Tandberg & Fryar, 2015:502). The success and effect of performance-based financing depend on performance indicators and their coefficients in universities budget (Teixeira, Biscaia & Rocha, 2014:227). Also, appropriations allocated through performance-based financing are linked to the performances in the previous year of higher education institutions. The formula implemented to calculate financing amount is based on performance indicators such as number of graduation (Orr, 2005:37).

The real target is to enhance the performance levels linked to the universities' specific polities such as supporting higher education participation, accelerating information transfer and improvement of university-industry cooperation (Estermann & Claeys-Kulik, 2016:32). While performance-based financing is applied, the allocations to higher education institutions by central governments are used as a block grant with limited restriction or without any restriction (Orr, 2005:37).

In performance-based financing, Two substitutes are used in allocation to state universities: (i) The first one is closed-ended appropriation whose total amount is previously determined by the central government. It is supposed that universities can compete with each other to have more performance allowance since total amount is certain and limited. (ii) The second one is open-ended appropriation. Total amount which a university can have is determined by the performance level of university. So the allowance amount of a university cannot affect the amount of another university (Demirbaş, 2009:85). While determining the appropriation amounts to be allocated according to the performance level, the first method is that performance indicators are ordered by importance levels. In other words, the importance levels of some indicators are dominant than others. Thus, every performance indicator has different coefficient. The second method is that every performance indicator has equal coefficient. In a sense, the importance levels of performance indicators are identical (The Working Group of Public Ministry, 2011:12).

The Evaluation Formula Financing and Performance-Based Financing Together

As it is mentioned before, Performance-Based financing and formula financing are perceived by some researchers as expressing the same meaning, due to be used formulas in both of them. However, these two methods substantially differ from each other. Though formula financing is a form of traditional budget methods, performance-based financing is evaluated among modern budget methods. While input indicators (especially numbers of student) are important in formula financing, result and output indicators are important in performance-based financing. Input and process indicators are sometimes included in the scope of performance-based financing since result and especially output indicators can be hard to calculate. The coefficient of output indicators is absent or very little in formula financing.

Formula financing is an insufficient mechanism to improve quality because quality measures are infrequent in formula components or its calculation (Salmi & Hauptman, 2006:55). The quality criteria in performance-based financing are more than ones being in formula financing, due to the fact that the improvement of corporate quality is in its the core. While formula financing is a need-driven approach to resource allocation, performance-based financing is a success based approach (Layzell, 1999:240). The amount of allowances transferred to higher education institutions can be increased by being involved in performance-enhancing applications in the performance-based financing. The amount of allowances transferred to each institution in formula financing is equal, and the university which has more performance is not in an advantageous situation. In performance-based financing, the institution's success is important but in formula financing, the results calculated on indicators cannot affect the institutions' performance.

According to the report written by European Commission, although the coefficients of students' numbers in formulas have been decreased to provide more performance in some, countries, there is not any country which uses solo performance-based financing method (European Commission 2010:21). It means that the formulas consist of several result indicators and several input indicators. On the other words, the financing amount based on performance generally is not more than the amount based on input indicators (Estermann & Claeys-Kulik, 2016:32). Across Europe, it is hard to understand performance-based financing. Performance-based financing is identified with formula financing because the indicators used in formula financing are not taken into consideration as input or output in many situations (Estermann, Pruvot & Claeys-Kulik, 2013:9).

The strengths and weaknesses of methods examined in this study are showed in Table 1. In Çekiç's study (2010) quoted, formula financing are compared with performance-based budgeting. It is needed to explain a point. The main theme of this study is performance-based financing so some additions and changes have been made in performance-based budgeting column which is in the original study. Thus the final version of table has been arranged according to the aim of study.

Table 1.The strengths and weaknesses of formula financing and performance-based financing

	Strengths	**Weaknesses**
Performance Based Financing	• Focuses on achievements (outputs), • Neutral, • Provides manageable freedom of movement, • Contains different dimensions in terms of quantity and quality, • Provides additional income, • Establishes strong links between government and higher education institutions, • Allows governments to save money, • Increases efficiency, • Describes results and quality, • Encourages, • Provides cross-institutional comparison, • Compares input-output indicators, • Fosters innovation, Supports corporate development, • Transparent, requires accountability, • Provides self-criticism,	• Confidence in input and output criteria may occur, • Incorrectly identified corporate missions, • Special purpose, • Causes deterioration in corporate activity, • Causes instability of the system, • Includes financing insufficiencies, • Fiscal planning mistakes can be made, • Contains many indicators, • Identifies indicators which are hard to measure, • Causes structural differences between faculties, • Identifies low standards, • Leads validity and reliability problems in some cases.

	• Supports competition.	
Formula Financing	• Simple, • Provides equality, • Reduces conflicts, • Neutral, • Accountability, • Reusable, • Transparent, • Reduces lobbying activities.	• A status quo structure, • Lack of planning, • Includes flexibility , • Focuses short turn focuses. • The incentives in the form can be identified close or clear, • Contains quantitative criteria. • Rigid and simplistic formulas.

Reference: Çekiç, 2010:8

In table 2, the similar and different aspects of financing methods are indicated together.

Table 2.The Similarities and differences of performance-based financing and formula financing

Similarities	Differences
• There is a formula in both methods. • Both of methods use indicators. • Increased institutional freedom in both of methods. • Both of methods are used to finance public resources. • Transparency in both of methods is preliminary.	• While the input indicators such as students' numbers in the formula funding are primary output and result indicators are important in the performance-based financing. • The resources in formula financing are allocated equally, but the institutions which show high performance can have a chance to be given more allocations in performance-based financing. • There is no success measure in formula financing, and an institution's performance is ineffective on financing. In performance-based financing, there is a success measure, and the institutions' performance has effects on allocations. • In performance-based financing, performance-enhancing applications are taken into consideration. A good example of this is bonus payment. However, there is no similar application in formula financing. • Negotiation is not valid in the context of formula financing, but it is possible in performance-based financing. • While the quality improvement is primarily, the quality improvement is more important in performance-based financing. • Formula financing is a needed-based approach, whereas performance-based financing is a success-based approach.

Reference: Herbst (2009:68), Salmi & Hauptman (2006:55), Layzell (1999:240), The Working Group of Finance Ministry (2011:11), Demirbaş (2009:83-84), Schmidt (2011:317), İlyas (2012:21).

Conclusion

When the results of this study have generally been evaluated, it is obvious that formulas are used in the context of two financing methods. Also, the calculations are done through the coefficients of indicators. Especially, they are preferred by allocating public funds to higher education institutions. And transparency, institutional freedom and accountability are become high importance in allocation. They are assumed as synonym in theory practice because of their similarities. But in most European countries, formula financing and performance-based financing are used each other by using together.

When they are analyzed in terms of their differences, the most important point is that performance-based financing focuses on success and quality improvement. On the contrary, the successes of institutions and quality improvement are not considered in formula financing. In other words, formula financing is a needed-based approach. Input indicators are addressed in formulas. Although a few output and result indicators are included in formula financing, the numbers of them are enough to prove achievement of universities. In formula financing, the numbers of students and staffs or costs per student are dominant indicators. If they are examined in terms of resource allocation, the resources are allocated equally in formula financing. However, a higher institution which has higher performance may get more than others. Achievement is a decisive factor in performance-based financing. So the performance-based financing is identified as success-based approach. The difference between them is that bonus payment that fund institution extra is valid in performance-based financing. This incentive may support higher education institution to reach better performance.

Finally, if governments want to create positive effect to the performances of universities, performance-based financing method is quite useful. With the comparison of their strengths, performance-based financing have more improvement points than formula financing. But there is something to be highlighted. Usage of the method solely is a bit hard. Designing of the method in detail should be needed in order to stimulate the performances of higher educations. Otherwise, the two methods will be used instead of each other and will cause some problems in practice.

References

Ahmad, A. R., Saripuden, S. ve Soon, N. K. (2014). Analysis of the Higher Education Funding Systems, 24. International Business Information Management Association (IBIMA *2014*). *6*-7 November *2014*, Milan, Italy.

Alkaraan, F. & Jaba, A. (2011). Higher Education Budgeting Reform: Towards Efficiency, Effectiveness and Economy. *International Higher Education Congress: New Trends and Issues*, 2(5), 1135–1141.

Benneworth, P., Boer, H. de, Cremonini, L., Jongbloed, B., Leisyte, L., Vossensteyn, H. & Weert, E. de (2011). *Quality-related Funding, Performance Agreements and Profiling in Higher Education An International Comparative Study*. Centre for Higher Education Policy Studies (CHEPS) University of Twente, The Netherlands.

Çekiç, O. (2010). Exploring the Relationship between Incentives-Based Budgeting and Organizational Governance in Higher Education Institutions: A Case Study of a Public University. *Uşak University, The Journal of Social Science Institution*, 3(1), 83-102.

Demirbaş, T. (2009). A New Approach for Allocating Approprıations to State Universities: Performance Funding. Faculty of Economics, Finance Research Center Conferences İstanbul University, Volume: 52. Seri, The Gift Book to Prof. Dr. Şerafettin Aksoy, 80–105.

Ecker, B., Leither, K-H. & Frolich, C. (2011). Funding Formulas for Teaching in Public Universities: International Experiences and Lessons Drawn from a Science Policy View. Retrieved from http://www.eua.be/Libraries/Funding_Forum/EUA_Ecker_article_web.sflb.ashx, 21.08.2017).

Estermann, T. & Cleys-Kulik, A. L. (2016). Performance-Based Funding of Universities in Europe. *International Higher Education*, 85, 31-33.

Estermann, T., Pruvot, E. B. & Claeys-Kulik, A. L. (2013). Designing Strategies for Efficient Funding of Higher Education in Europe, Define Interim Report. European University Association, Brusels, Belgium.

European Commission (2010). Funding Higher Education: A View Across Europe. Lifelong Learning Project N° 142354-LLP-1-2008-1-BE-ERASMUS-ENW, 2010 ESMU.

Herbst, M. (2009). Performance-Based Budgeting or Funding, *Higher Education Financing Public Universities the Case of Performance Funding.* Springer + Business Media, The Netherlands.

Hillman, N. W., D. A. Tandberg and A. H. Fryar (2015). Evaluating the Impacts of "New" Performance Funding in Higher Education. *Educational Evaluation and Policy Analysis*, 37(4), 501-519.

Gorbunov, V. A. (2013). Performance Funding in Public Higher Education: Determinants of Policy Shifts. Unpublished PhD. Thesis, Graduate School of Vanderbilt University, Nashville, Tennessee.

Jordan, M. M. & Hackbart, M. M. (1999). Performance Budgeting and Performance Funding in the States: A Status Assessment. *Public Budgeting & Finance*, 19(19), 68-88.

Ilyas, E. İ. (2012). Evaluation of Higher Education Financing Mechanisms and a Model Proposal For Turkey, The Turkish Republic. Development Ministry, General Directorate of Social Sectors and Coordination, Publication No:2338, March.

Layzell, D. T. & Caruthers, J. K. (1995). Performance Funding at the State Level: Trends and Prospects. Presented in the Annual Meeting of the Association for the Study of Higher Education, Florida, November 2-5.

Leszczensky, M., Orr, D., Schwarzenberger, A. & Weitz, B. (2004). Staatliche Hochschulsteuerung durch Budgetierung und Qualitätssicherung: Ausgewählte OECD-Länder im Vergleich. Hannover: HIS GmbH.

Orr, D. (2005). Can Performance-Based Funding and Quality Assurance Solve vs Market Conundrum?. *Higher Education Policy*, 18(1), 31-50.

Salmi J. & Hauptman, M. A. (2006). Innovations in Tertiary Education Financing: A Comparative Evaluation of Allocation Mechanism. Education Working Paper Series, No:4. The World Bank.

Schmidt E. K. (2011). University Funding Reforms in the Nordic Countries, *In University Reform and Consequences in Finland and Japan. Dobson, I. and Maruyama, F. (eds).* Anthology. Centre for National University Finance and Management, Tokyo, Japan.

Teixeira, P., Biscaia, R. & Rocha, Y. V. (2014). Competition and Performance in European Higher Education: The Role of Funding Instruments. *Páginas de Educación*, 7(2), 217-233.

The Working Group of Finance Ministry (2011). Kaynak Tahsisinde Performans Yönetiminin Esas Alınması-Yükseköğretim Örneği. Publications of Finance Ministry, Ankara.

The World Bank (2010). Main Features of Current Funding Policies and Practices, Financing Higher Education in Africa. Washington D.C.

Tüğen, K. (2014). *Devlet Bütçesi (State Budget).* Edition 13, Bassaray Publishing, İzmir.

Ziderman, A. & Albrecht, D. (1995). *Funding Mechanisms for Higher Education: Financing for Stability, Efficiency, and Responsiveness.* World Bank Discussion Paper, No:153.