

# Dynamic Financing Models of Tertiary Education According to Market Needs

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## ABSTRACT

Economic methods and decentralisation are the most effective means in managing any process. Any funds of tertiary educational institutions, both earned by the institution and allocated as state budget subsidies, should be handed over directly without intermediaries to the parties who performed the work. Funds should be allocated according to the unified methodology, and the workload to be accomplished in a definite period of time is the main criterion. Workload to be accomplished is measured according to strictly defined and measurable parameters.

In actual practice, there is a tendency to add work quality as an additional criterion. It is problematic to apply the quality criterion because, firstly, the quality of any work performed by professionals cannot be below certain standards; secondly, there are no measurable, definite parameters for quality assessment if work outcome is a service. Education is a commodity, specific commodity actualised as a service.

The author offers the algorithm of calculation methodology of fund allocation that is described considering the experience of Riga Technical University, where this methodology has been implemented.

**Keywords:** higher education, state budget, tuition fee.

## 1. INTRODUCTION

The provision of financing for higher education has always been an actual topic, for it to be appropriate. One of the most relevant questions in the world is financing for education – of which already are many articles and publications based on researches. The country – the government – always is trying to finance higher education, but it will always be insufficient and will not provide for all the functions

to work correctly [1]. A topicality has become the rational and effective use of budget resources for the provision of education process, as well as obtaining the assessment of the results.

In the overall financial management methodology the subsidies of government budget and the financing of universities themselves – it further distribution and use development issues in higher education institutions are very important, because on it depends the rational and effective use of funds, as well as from government, as from private sources [3].

As one of the most important principles is the determination of the accordingly base unit of distribution. To determine and choose in advance of which ensure the study process and realize the other activities, should be distributed financial means, therefore, who are the main beneficiaries of these funds and users of higher education institutions [2]. By means of a common methodology the funds are distributed and it results in total structural unit revenue, of which is settled the public utility payments and covered other expenses. In the end result there is created balance sheets of separate departments and university revenue – expense balance sheet.

Methodology reveals how out of the state budget distributed grants – no budget revenue – could be divided and directed to study process realizing, considering certain conditions and principles for these funds rational and more efficient use – it is based on its lifelong approbation experience in RTU.

## 2. LITERATURE REVIEW

It is necessary to perform relevant groundwork for the establishment and implementation of decentralised automatic management system at the tertiary educational establishment:

1) To select a cornerstone for the system architecture: either an individual or a structural unit.

A structural unit was chosen as a less dynamic but stable element of the system, which can serve as a basis for a flexible management system. Further it is necessary to establish a legal basis for the structural units – the structural units are established and liquidated by decision of the Senate of the tertiary educational establishment.

2) When an array of structural units of the tertiary educational establishment is formed, it should be connected to the array of employees, thus developing an automatic management system “Personnel”. It is necessary to allocate employees such as teaching and maintenance staff to the corresponding structural units; to elaborate staff recruitment and dismissal policies, to determine financial responsibility and any additional duties in accordance with labour laws and regulations. Any necessary limitations should be incorporated into a system.

3) The register of the study courses taught at the tertiary educational establishment and used in study programme design was developed at the next stage. The programmes in their turn are offered in the Latvian and foreign tertiary education market. It was specified that study courses can be registered using a special algorithm only by professors, associate professors, assistant professors and lecturers. The registered study courses were evaluated by the Senate Commission of the tertiary educational establishment and were accepted or declined by the Department of Academic Affairs. Accepted study courses were included in the register. All study courses were divided into four categories: compulsory study courses characteristic of tertiary education, the range of which determines whether a tertiary educational establishment majors in exact sciences or humanities, compulsory study courses aiming at training skills and competences necessary for a particular profession, optional study courses, which provide opportunity to gain additional skills in the chosen professional field, elective study courses which students can choose to enrich their competence in particular fields whether because they lack certain knowledge or they want to acquire additional knowledge, skills and competences in the fields unrelated to mastering a particular profession [7]. After that it is necessary to determine the procedure of amending the study courses, and who is eligible to do that. As study courses are registered by the teaching staff of the tertiary educational establishment, and the academic staff in their turn is allocated to the structural units, the study courses are automatically allocated to the structural units. The structural units are legally

responsible for the quality of the study courses and the study process as well as for providing educational and methodological literature, facilities and equipment. Then it is necessary to solve a problem concerning a study course that arises when teaching staff switch structural units or quit their job; it should be determined how the person who registered a study course can authorize other members of the teaching staff to teach the study course in question, for example, at affiliates.

4) At the next phase the Study Programme Register of the tertiary educational establishment should be developed. After that it is necessary to determine the procedures, financing and legal responsibility for design, registration, evaluation, endorsement, licensing and accreditation of the study programmes in compliance with laws and regulations of the Republic of Latvia. Study programmes can be designed only of the study courses that are endorsed and included in the Study Course Register of the tertiary educational establishment. If there is a need for additional study courses, they have to be registered, endorsed and included in the Study Course Register, and only after that it is possible to proceed with the design of the study programme.

5) In order to fairly, independent on the subjectivism of the human factor, allocate state budget funds and student tuition fees to each structural unit using a unified algorithm, it is necessary to develop a principal calculation document [5]. Salaries and other fund limits for an academic year or semester assigned to each structural unit are calculated on the basis of this document. The head of the study programme or an authorized person develops an electronic version of the principal calculation document. The head of the study programme holds full responsibility for the validity of this document.

6) Completed and developed principal calculation document is electronically sent to the responsible financial manager of the tertiary educational establishment, who verifies and endorses it.

7) Prior to allocation of budget funds of the tertiary educational establishment, it is necessary to form 5 types of arrays of the endorsed principal calculation documents: allocation of state subsidies (state order) for an academic year (12 months), allocation of tuition fees paid by full-time students for a semester (6 months), allocation of tuition fees paid by part-time students for a semester (6 months), allocation of tuition fees paid by extra-mural students for a semester (6 months), and

allocation of tuition fees paid by full-time, part-time, extra-mural students and those enrolled at individual study programmes for a semester (6 months). State subsidies are allocated to structural units once per academic year (in October), but tuition fees – twice per academic year (in November and April). The fiscal year of the tertiary educational establishment should start on 1<sup>st</sup> October and finish on 30<sup>th</sup> September. Setting such a time period allows reducing university bankruptcy risks significantly, as state subsidies are transferred to the tertiary educational establishment accounts starting with 1<sup>st</sup> January, but tuition fees – during August and September for the first semester, and during February and March for the second semester.

8) Having formed the above-mentioned arrays of principle calculation documents, the Financier (Chancellor), in cooperation with the Head of the Planning and Finance Department, develops an electronic version of regulations on calculation of funds for each array of principal calculation documents for a particular academic year or semester. If studies are offered on a self-funded basis and are organized individually, i.e. only to the students enrolled at the study programme, separate regulations on calculation of funds for the principal calculation document of each study programme are developed.

9) When the arrays of principal calculation documents and the regulations on calculation of funds are developed for an academic year or a semester, funds can be allocated. The above-mentioned arrays and regulations can be developed both simultaneously and successively, but calculations are made only successively by fund type.

The methodology can be used only for allocation of state budget subsidies and tuition fees; other income is allocated to structural units according to other methodologies or procedures confirmed by the Senate of the tertiary educational establishment.

All funds that are transferred to the account of a tertiary educational establishment are allocated to all structural units of the establishment according to the unified methodology or procedure. The units are the actual performers of the given work. The allocation of any funds to structural units is based on the principle that funds, which are assigned for a special work to be accomplished, should be handed over directly without intermediaries to the structural units, which specialise in the implementation of the work, and are responsible for it [4]. At the time of

calculation the tertiary educational establishment has „m” number of structural units (this number is dynamic), which can be divided into two categories: the structural units which receive state subsidies, and the structural units that should earn funds themselves, because they instruct specialists at the programmes, which are not commissioned by the state. All funds, which the structural units manage to raise themselves following the code of ethics of the tertiary educational establishment, remain at the disposal of the structural units [6]. Tuition fee is set for each study programme separately following the current actual costs and the tertiary education market situation in the given year. The tuition fee is confirmed by the Senate of the tertiary educational establishment annually, and it remains fixed during the entire study period. The methodology of allocation of budget subsidies and tuition fees is confirmed by the Senate of the tertiary educational establishment; this issue is annually reviewed by the Senate, and adjusted if necessary.

The amount of budget subsidies allocated to the tertiary educational establishment by the Ministry of Education and Science or tuition fees paid by the students, which is specified in the regulations on the calculation of funds, is initially divided into two parts: salaries and other funds according to the ratio specified in the regulations. Calculation methodology is described considering the experience of Riga Technical University (RTU).

$$N_{d/a} = 0.60 N_{RTU} \text{ and } N_{p/l} = 0.40 N_{RTU} \quad (1)$$

where

$N_{RTU}$  - budget subsidies allocated to RTU by the Ministry of Education and Science or tuition fees, LVL;

$N_{d/a}$  - salary fund, LVL;

$N_{p/l}$  - other funds, LVL.

According to the decision of the Senate of the tertiary educational establishment, 1% of the above-mentioned funds is dedicated to internal (RTU) scientific projects and is allocated on a competitive basis by the Commission appointed by the Vice-Rector for Research.

$$N^z_{d/a} = 0.01 N_{d/a} \text{ and } N^z_{p/l} = 0.01 N_{p/l} \quad (2)$$

where

$N^z_{d/a}$  - salary fund for internal (RTU) scientific projects, LVL;

$N^z_{p/l}$  - other funds for internal (RTU) scientific projects, LVL.

The remaining sum is calculated for further allocation:

$$N'_{d/a} = N_{d/a} - N^z_{d/a} \text{ and } N'_{p/l} = N_{p/l} - N^z_{p/l} \quad (3)$$

where

$N'_{d/a}$  - the remaining part of salary fund for further allocation, LVL;

$N'_{p/l}$  - the remaining part of other funds, LVL, which should be respectively reduced for further allocation:

$$N''_{p/l} = N'_{p/l} - 0.2409 N_{d/a} - S^t - 8,0 S_v \quad (4)$$

where

$N''_{p/l}$  - the remaining part of other fund for further allocation, LVL;

$0.2409 N_{d/a}$  - compulsory social security contribution, LVL;

$S^t$  - scholarships and transport service compensation, LVL;

$8.00 S_v$  - library funding (LVL  $8.00 * S_v$  - the number of RTU students studying on the state budget confirmed by the Ministry of Education and Science or the number of students, who pay tuition fee, LVL).

The next step is to deduct funding from  $N'_{d/a}$  and  $N''_{p/l}$  for centralized services in compliance with ratios specified, which are calculated for a year and confirmed by the Senate. Thus, the salary fund volume allocated to the structural units (departments and professor groups)  $N'_{f d/a}$  and the volume of other funds  $N''_{f p/l}$  are acquired.

In order to sustain the most qualified teaching staff, professors, and to facilitate ongoing training of teaching staff in the structural units, the value denoting a fixed portion of salary -  $N'_p = \text{LVL } 200 * P^s_{v.sk.}$  and a fixed portion of other funds -  $N''_p = \text{LVL } 6.46 * 50 m^2 * P^s_{v.sk.}$  is introduced in the model, where  $P^s_{v.sk.}$  is a number of professor positions on the permanent staff at the university at the moment of calculation. The volume of the fixed portion for each structural unit depends on the number of professors on the permanent staff. These values are calculated for a month and refer to allocation of state budget funds only; in order to calculate the total for a year, the value should be multiplied by 12.

Concurrently, the work load for an academic year or semester for each study course, study programme, faculty and university in general is calculated in the array of principal calculation document [8]:

$$D^i_{MP} = S_v^i * K P^i * b^i * a^i \quad (5)$$

where

$D^i_{MP}$  - work load at the  $i^{th}$  study course;

$S_v^i$  -  $i^{th}$  number of budget study places or students at the study course;

$K P^i$  -  $i^{th}$  number of credit points at the study course;

$b^i$  -  $i^{th}$  study course domain ratio;

$a^i$  -  $i^{th}$  study course study level ratio.

Having summarised the work load per study programme for all study courses, the  $i^{th}$  study programme work load is arrived at -  $D^i_{s/p}$ .

Having summarised the work load per all study programmes implemented by a faculty, the  $i^{th}$  faculty work load is arrived at -  $D^i_f$ .

Having summarised the work load per faculties, institutes and affiliates of the university, the work load of the university is arrived at -  $D_{RTU}$ .

Finally, salary and other expenses attributable to one study place or per credit point are calculated:

$$n'_{d/a} = \frac{N'_{f-d/a} - N'_p}{D_{RTU}} \quad (6)$$

$$n''_{p/l} = \frac{N''_{f-p/l} - N''_p}{D_{RTU}} \quad (7)$$

When the value of one study place or student credit point for a study year or a semester has been calculated according to the types of funds to be allocated, salary fund and other fund limits are calculated.

1) Resources for a separate study course are calculated within the framework of each study programme, defining the amount of salaries and other funds (expenses):

$$N^{s_i}_{MP} = D^i_{MP} * n'_{d/a} \text{ (LVL)} \quad (8)$$

$$N^{o_i}_{MP} = D^i_{MP} * n''_{p/l} \text{ (LVL)} \quad (9)$$

where: the amount of salary and other funds attributable to  $i^{th}$ -study programme is a sum of the

values of the study courses, which the study programme is designed of.

2) The fund limits attributable to departments and professor groups, salaries and other funds are determined as a sum of calculated value of salaries and other funds attributable to the corresponding structural unit, fixed portion added (only for subsidies). Subsidies are calculated for a period of a year, tuition fees – for a semester.

Calculations are built into software and processing takes up about 2-3 hours. Eventually, three types of documents are drawn up: study programme work load, LVL; structural unit work load, LVL, as well as study course work load within a structural unit, LVL. These documents electronically as well as in the printed form are sent by the responsible financial manager or Chancellor service to the Planning and Finance Department and to structural units. Particular applications are used to input the data into accounting software. The heads of the structural units adjust these limits within a period of two weeks, reallocating resources to or receiving from other structural units according to calculated fund limits. Figures for adjusted fund limits should be submitted to the Planning and Finance Department. The number of employees and their salaries should be adjusted in accordance with new fund limits. The access to this information is differentiated: the heads of departments have access only to the data concerning funds and expenditure attributable to their department, the heads of institutes have access to the data on funds attributable to structural units within the institute, the deans have access to the data on funds attributable to structural units within the faculty; the head of the Planning and Finance Department, Rector, Vice-Rectors and Chancellor have access to the data attributable to all structural units.

## CONCLUSIONS

Education is a commodity, specific commodity actualised as a service. All funds that are transferred to the account of a higher educational establishment are allocated to all structural units of the establishment according to the unified methodology or procedure. The allocation of any funds to structural units is based on the principle that funds, which are assigned for a special work to be accomplished, should be at the disposal of the structural units, which specialise in the

implementation of the work, and are responsible for it.

It is necessary to perform relevant groundwork for the implementation of decentralised automatic management system. This methodology can be used only in allocation of state budget subsidies and tuition fees.

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