Development of a Model of Financial Stability of Universities

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Abstract: The financial stability of state universities is the basis for the sustainable progressive development of this area. The most important direction of the strategic policy of state administration is the management of the educational process. The relevance of the topic of the work is due to the need to ensure the financial stability of educational organizations, which seems to be an important task in the framework of increasing the efficiency and effectiveness of the activities of organizations subordinate to the Ministry of Science and Higher Education in terms of financial and economic activities. The subject of the research is the development of a model of financial stability of a public institution. The existing methods for assessing the financial condition of commercial organizations cannot be applied to the analysis of the financial condition of budgetary structures. The information base of budgetary institutions differs in many respects in the content of a number of indicators of the balance sheet from commercial organizations. The authors used an analytical approach in the study of existing approaches to assessing financial stability. The result of the work is a model for assessing the financial stability of universities. It allows you to determine the level of financial stability of any university and identify those areas of activity where there are negative results that have affected the indicators of financial stability in general. This will ensure effective planning in the formation and allocation of resources. The methodological basis of the study was methodological recommendations for the analysis and diagnostics of financial stability, as well as publications of leading experts in the field of economics.

1 INTRODUCTION

According to the Ministry of Science and Higher Education of the Russian Federation, the Federal State Statistics Service and the National Research University "Higher School of Economics", the dynamics of the number of state, municipal and private universities in 2000–2019 changed as follows (Figure 1). During the period under review, the number of state and municipal Russian universities exceeded the number of private ones by 1.4 - 2 times (Bondarenko, 2019).
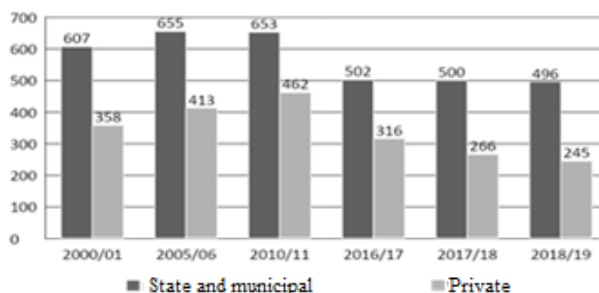

Figure 1: Change in the number of state, municipal and private universities in Russia in 2000–2019.

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Statistics of the last twenty years confirm that Russian higher education is provided largely by state and municipal universities. Higher education in the Russian Federation is one of the priority areas for the state.

The financial stability of state universities is the basis for the sustainable progressive development of this sphere. The efficiency of the formation and distribution of resources, financial results and the level of solvency determine financial stability. Considering the essence of financial stability, it should be noted that it implies not only maintaining a positive level of indicators characterizing it, but also includes development, which is manifested in economic growth. Namely, there are tendencies of positive changes taken together indicators of the economic and financial development of the organization over a certain period (Kovaleva, 2019).

The object of our research is to assess the financial sustainability of public universities.

The most important direction of the strategic policy of state administration is the management of the educational process. The scientific, industrial, ecological, cultural and political potential of the country directly depends on the quality of education of the population.

Along with organizations and commercial enterprises, budgetary institutions, based on the results of work for the reporting period, determine economic or financial indicators (results) of economic activity. The economic indicators of the activities of budgetary institutions are used for economic planning of the activities of the institution in the analysis of economic activities, as well as to determine the tax base.

The most important indicators of the activities of a budgetary institution include:
- receipts by income;
- payments for expenses;
- the amount of subsidies for the fulfillment of the state assignment.

When making managerial decisions and conducting financial and economic activities of state institutions, its directions may change, and as a result, they may face the problem of ensuring and maintaining financial stability.

2 MATERIALS AND METHODS

The technology of the process of managing a budgetary organization includes closely interrelated functions: planning, accounting, analysis and regulation (Aidemirova, 2017).

The instability of the financial state of the budget of a state organization is characterized by a low level of its own sources of budgeting, imbalance, inability to correctly distribute revenues and a low share of social spending in their total amount.

With a stable financial condition, there is a sufficient amount of own sources of income, the budget is balanced; the priority is to finance the social and cultural sphere.

In terms of its structure, the information base of budgetary institutions differs in many respects in the content of a number of balance sheet indicators from the base of commercial organizations, and it should be noted that in order to improve financial stability, it is necessary to take into account changes in the structure of property and sources.

In this regard, it should be noted that the methods for assessing the financial condition of commercial organizations could not be applied to the analysis of the financial condition of budgetary structures in a more or less long-term perspective. This is largely due to the restrictions related to the specifics of budgetary institutions, and is expressed in the fact that:
- when calculating the autonomy ratios (the ratio of own and borrowed sources), the cost of equity capital is used, whose value is displayed as part of the liability of the balance sheet of a commercial organization. The state budgetary institution does not form its own capital, and the liabilities of its balance sheet include only two sections: "Liabilities" and "Financial result".
- the calculation of financial stability ratios (the ratio of own and borrowed sources of financing) is carried out on the basis of the classical methodology, using the value of long-term liabilities. Nevertheless, relying on clause 14 of Article 9.2 of the Federal Law of 12.01.1996 No. 7-FZ (as amended on 08.06.2020) "On non-profit organizations": "Budgetary institutions are not entitled to place funds on deposits with credit institutions, as well as make transactions with securities, unless otherwise provided by federal laws" (Frolkin, 2016).

Based on the proposed methods for calculating financial stability indicators applicable for a state university, we can propose an integrated approach that combines all methodological approaches, but excludes duplication.

3 RESULTS

To develop a model of financial stability, we present the absolute and relative indicators borrowed from the models of the Ministry of Education, as well as the methods used to analyze the financial stability of commercial organizations (Financial sustainability, 2016). Table 1 presents the absolute indicators applicable to characterize the financial stability of a public university.

Table 1: Accumulated absolute indicators of the financial stability of the university.

Indicators	Value
Total number of students in undergraduate, specialist and graduate programs	The sum of the number of students enrolled in educational programs of bachelor's, specialist's and master's degrees
The number of enlarged groups of specialties and directions (hereinafter - UGSN)	Share of UGSN in the total amount
The total number of the teaching staff (hereinafter PPS)	The total number of teaching staff excluding internal part-time workeřs and working under civil contracts, excluding the occupied rates, expressed as a percentage.
The proportion of the number of students enrolled in master's programs and programs for the training of scientific and pedagogical workers (hereinafter - SPW) in graduate school in the total number of the given contingent	The ratio of the reduced contingent of students to the reduced contingent of students in Master's programs and postgraduate teaching staff training programs
The number of publications of the organization, indexed in the information and analytical system of scientific citation - Russian Science Citation Index (RSCI), per 100 academic staff	The ratio of the number of publications published in the reporting year, included in the RSCI, to the number of teaching staff, multiplied by 100
The amount of income from educational activities	The amount of funds of the organization received during the reporting year from educational activities
The amount of subsidies for the fulfillment of a state task (hereinafter referred to as the GZ)	This subsidy is provided to institutions in accordance with paragraph one of clause 1 of Article 78.1 of the Budget Code of the Russian Federation (Kuznetsova, 2016).

Table 2: Accumulated relative indicators of the financial stability of the universityю

Indicators	Value
The volume of research and development work per 1 academic staff	The ratio of the total amount of funds received during the reporting year from the implementation of research and development work to the number of teaching staff.
Average score of the Unified State Exam	The ratio of the sum of the average Unified State Exam scores of students enrolled in full-time studies based on the Unified State Exam results, adopted based on the results of targeted admission in all areas and specialties of bachelor's and specialty programs, multiplied by the number of such students enrolled in the corresponding areas and specialties of bachelor's and specialty programs to the total number of such students. The results of students eligible for admission without entrance examinations are recognized as the highest Unified State Exam results (100 points) in the relevant general education subjects (Improving the financial, 2018).
Income from all sources calculated on the number of students (reduced contingent)	The ratio of the amount of the organization's funds received during the reporting year from budgetary and non-budgetary sources to the reduced contingent of students enrolled in bachelors, specialists, and master's programs.

Continuation of table 2

Accumulation of deterioration	Shows the degree of depreciation of fixed assets
Autonomy ratio	Financial result (own funds) / The total amount of sources of formation of the property of the university (excluding obligations to the founder) (Batkovsky, 2017)
Dependency ratio	Obligations to creditors / The total amount of sources of formation of the property of the university (excluding obligations to the founder) (Improving the financial, 2018)
Coefficient of provision of non-current assets with long-term sources of financing	The total amount of sources of formation of non-current assets / Total non-current assets
Autonomy indicator (PFY-1) PFY - an indicator of financial stability	The share of receipts from income-generating activities in the total volume of receipts from income-generating activities and subsidies for financial support for the fulfillment of the state task
Increase in receipts from income-generating activities (PFY -2)	Increase in receipts from income-generating activities in the reporting period in relation to the period preceding the reporting period
Debt burden ratio (PFY -3)	Dependence of educational activities on borrowed funding sources
Share of overdue accounts payable (PFY -4)	The ratio of the volume of accounts payable to the total volume of accounts payable (excluding income payables)
Share of overdue receivables (PFY -5)	The ratio of the amount of overdue receivables to the total amount of receivables
Deficit of funds from income-generating activities (PFY -6)	Assessment of the indicator of accounts payable to funds from income-generating activities

Table 2 shows the relative indicators of the financial stability of the university. Analysis in these areas involves the use of available information contained in public reports. This makes it possible to conduct a comprehensive assessment of the financial stability of a state university. In general, the actual financial condition of the organization can be represented only by the integrated use of the results of absolute and relative indicators.

4 DISCUSSION

Of great importance in the analysis of the financial stability of an organization is the use of absolute indicators:

- the total number of students in undergraduate, specialist and graduate programs,
- the amount of income from educational activities,
- the total number of teaching staff, the proportion of students in graduate programs and postgraduate teaching programs in postgraduate studies in the total number of contingent,

- the number of publications of the organization, indexed in the information and analytical system of scientific citation, per 100 academic staff,
- the amount of subsidies for the implementation of the State Task, the number of enlarged groups of specialties and directions. These indicators are criterial, since they are used to form metrics that allow you to determine the quality of the financial condition (Flagship Universities of Russia, 2020).

Relative values play an extremely important role in modern conditions in the analysis of financial stability, since they smooth out the distorting effect of inflation on the reporting material. Their prevalence is due to a certain advantage over absolute indicators, since they allow one to compare objects that are incomparable in absolute values, are more stable in space and time, characterize homogeneous variation series, and also improve the statistical properties of indicators. The choice of indicators for the analysis of financial stability should contribute to solving the problem: to assess the financial stability on the basis of accounting data.

As a result of the work done, we propose a model for analyzing the financial stability of a state

budgetary educational institution of higher education, created as a result of using all the above indicators, taken from the classical methods of calculating financial stability and indicators of the Ministry of Education.

Using this technique, you can analyze the company's activities throughout its existence and carry out calculations annually to observe and analyze the dynamics of the indicator. In the future, we transferred all indicators to a point estimate, which helped to draw a general conclusion about the level of financial stability based on the results of assessing both absolute and relative indicators.

The peculiarity of this model is that the financial stability of the company is divided into the factors that describe it. The factors represent the properties of the first level, to which we attributed such characteristics as - educational activities, research activities, the state of fixed assets and financial and economic activities. Further below the level are indicators describing these factors, they constitute the second level of indicators. Figure 2.2 shows the tree of properties of the model for assessing the financial stability of the state budgetary educational institution of higher education.

The model includes the properties of three levels, 0 - the level is the main property, the indicator to the definition, which our model aspires to. Below the level, the enlarged properties are indicated, which represent those areas of activity to which the indicators we have highlighted belong.

The model presents the absolute and relative indicators of the second level in the amount of twenty-one.

For the best perception of the results, we suggest using weight-adjusted scores, that is, each indicator will have a weight of 0.048 for each of the 21 indicators out of a total ideal result of 1 or 100 percent. Each of the indicators of the university receives a point taking into account the compliance with one of the assessment factors. The calculation is based on the ratios, where 2 points in a 3-point gradation is 2/3 of the maximum mark, 1 point, respectively, 1/3, in a 2-point system a similar calculation. Accordingly, the scores adjusted for their weight are presented in Table 3.

Table 3: Scores of the model for assessing the financial stability of a state university, taking into account the weight.

Point score	Point weight in a 3-point grading system	Point weight in a 2-point grading system
3	0,048 (4,8%)	
2	0,032 (3,2%)	0,048 (4,8%)
1	0,016 (1,6%)	0,024 (2,4%)

Table 4 shows the scoring of the 2-level factors that describe the property of the 1-level "Educational activity". Each point can be "obtained" according to the condition indicated in the column for the absolute value of the factor.

Table 4: Indicators of the scoring of factors of the 2nd level of the category "Educational activity".

Indicator name	Point score	The absolute value of the factor
Total number of students in undergraduate, specialist and graduate programs	2	more than 10.000 students
	1	less than 10,000 students
The number of enlarged groups of specialties and directions (UGSN)	2	more than 20
	1	less than 20
Total number of teaching staff	3	The indicator has increased
	2	Indicator has not changed
	1	The indicator has decreased
The share of the number of students enrolled in Master's programs and postgraduate teaching staff training programs in the total number of the given contingent	2	more than 20%
	1	less than 20%

	3	from 80 to 100
The average score of the "unified state exam" of students taken on the basis of the results of the "unified state exam" for full-time education at the expense of the corresponding budgets of the budgetary system of the Russian Federation	2	from 60 to 80
	1	from 40 to 60
The average score of the "unified state exam" of students taken on the basis of the results of the "unified state exam" for full-time training with payment of the cost of training by individuals and legal entities	3	61.63 and up
	2	from 53.8 to 61.63
	1	44 to 53.8

Table 5 shows the scoring of the 2-level factors that describe the property of the 1-level "Research activity".

Table 5: Indicators of the scoring of factors of the 2nd level of the category "Research activity".

Indicator name	Point score	The absolute value of the factor
The number of publications of the organization, indexed in the information and analytical system of scientific citation, per 100 academic staff	2	More than 20
	1	Less than 20
R&D revenues (excluding funds from the budgets of the budgetary system of the Russian Federation, state funds for the support of science) per one academic staff	2	More than 150 th, rubles.
	1	Less than 150 th. rubles

A feature of this table is the use of only two-point gradation. The following Table 6 lists the metrics for the Basic Properties State property.

Table 6: Indicators of scoring of factors of the 2nd level of the category "State of basic properties".

Indicator name	Point score	The absolute value of the factor
Accumulation of deterioration	2	Less than 0.5
	1	More than 0.5
Coefficient of provision of non-current assets with long-term sources of financing	2	More than 0.6
	1	Less than 0.6

The final table describes the property "Financial and economic activity".

Table 7: Indicators of scoring of factors of the 2nd level of the category "State of basic properties".

Indicator name	Point score	The absolute value of the factor
The amount of income from educational activities	3	The dynamics are positive
	2	The volume did not change (± 5%)
	1	Dynamics is negative
The amount of subsidies for the execution of the state order	3	The dynamics are positive
	2	The volume did not change (± 5%)
	1	Dynamics is negative
Income from all sources calculated on the number of students (reduced contingent)	2	More than 200 thousand rubles.
	1	Less than 200 thousand rubles
Autonomy ratio	3	from 0.5 to 0.7
	2	more than 0.71
	1	less than 0.49
Dependency ratio	3	from 0.4 to 0.5

	2	from 0.5 to 0.7
	1	more than 0.71 and less than 0.4
Autonomy indicator (PFY-1)	3	Maximum value 70% or more
	2	Satisfactory value: 30% - 69%
	1	Minimum value 30% or less
Increase in receipts from income-generating activities (PFY -2)	3	Maximum value 8% or more
	2	Satisfactory value: 0% - 8%
	1	Minimum value 0% or less
Debt burden ratio (PFY -3)	3	Minimum value from 0% to 10%
	2	Satisfactory value: 11% - 24%
	1	Maximum value 25% or more
Share of overdue accounts payable (PFY -4)	3	Minimum value 0%
	2	Satisfactory value: more than 0% - up to 1%
	1	Maximum value 1% or more
Share of overdue receivables (PFY -5)	3	Minimum value 0%
	2	Satisfactory value: more than 0% - up to 1%
	1	Maximum value 1% or more
Deficit of funds from income-generating activities (PFY -6)	3	Maximum value 0% or more
	2	Satisfactory value: -15% - 0%
	1	Minimum value -15% or less

5 CONCLUSION

The paper proposes the absolute and relative indicators of financial stability used in the author's model. The authors presented a model for assessing the financial stability of a higher educational institution. For a more visual result, one or 100 percent was taken as an ideal indicator, while all indicators were assigned points in accordance with whether they correspond to the standard value or not. Thus, using this methodology, a state university is able to quickly and qualitatively analyze its activities from the point of financial stability and then determine which indicators should be emphasized in

the future when planning their activities. In order to develop the university in the future and increase its prestige among applicants, one should take into account those areas of activity in which negative values of indicators were obtained. In conclusion, we note that the analysis of the financial stability of a public institution of higher education in modern conditions is extremely important in the framework of increasing the efficiency and effectiveness of the activities of a higher educational institution.

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