

Indicators of the Universities Control Activities

Roman P. Bulyga, Elena V. Nikiforova, Irina V. Safonova

Abstract: This article presents a detailed analysis and content of the main objects of control of the university's activities, such as its potential, educational and scientific activities, as well as such independent objects of control as educational programs. The composition and general characteristics of the analytical indicators of the university's control activities are disclosed, such as indicators of assessment of its potential, indicators of control activities of the university as a whole, as well as the implementation progress of its educational programs. The results of the study are reflected in the matrix of control objects of university activities, which can be widely applied as methodological support for building a system for controlling universities' activities

Index Terms: financial resources, educational activities, educational programs, human capital, intellectual capital, intellectual property, marketing capital, organizational capital, scientific activity, social capital.

I. INTRODUCTION

In general, the objects of control activities of universities are the potential and activities of the university. The first object includes intellectual capital, material and technical base and financial resources, and the second includes the educational and scientific activities of the university. The educational programs of the university can be identified as an independent object of control. Each object of control includes certain elements whose content requires detailed study and disclosure [1, 10, 14, 20]. The system of indicators of the university's control activities includes three blocks of indicators:

- 1) indicators of assessment of the university's potential;
- 2) indicators of control activities of the university as a whole;
- 3) indicators of the implementation progress of its educational programs.

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Roman P. Bulyga, Doctor of Economic Sciences (Advanced Doctor), Head of the Accounting, Analysis and Audit Department of the Financial University under the Government of the Russian Federation, Moscow, Russia,

Elena V. Nikiforova, Doctor of Economic Sciences (Advanced Doctor), Vice Head of the Accounting, Analysis and Audit Department of the Financial University under the Government of the Russian Federation, Moscow, Russia,

Irina V. Safonova, Ph.D., associate professor of the Accounting, Analysis and Audit Department of the Financial University under the Government of the Russian Federation, Moscow, Russia

The indicators of assessment of the university's potential are designed to give a comprehensive picture of all components of the university's intellectual capital, financial resources, availability and condition of the material and technical base necessary for the implementation of the statutory activities of the university.

The indicators of control activities of the university as a whole aimed at identifying the degree of efficiency and effectiveness of the processes of the modern universities main activities as economic entities like education and research.

The indicators of the implementation progress of its educational programs are designed to ensure continuous monitoring of the degree of demand, and efficiency and quality of the implementation of individual educational programs by the university.

The composition and general characteristics of the indicators of each unit are described in detail in this article.

II. METHODS AND MATERIALS

A. GENERAL DESCRIPTION

During the research, the following methods were used: literature review, classification, comparison, grouping, use of averages, coefficient analysis, graphical and tabular presentation of data, induction, and deduction. The development of recommendations on the compilation and use of indicators of the universities control activities and analytical indicators of the procedures for controlling university educational programs were carried out based on a study of the current legislation of the Russian Federation and previous research on this topic [12, 15, 17, 18, 19].

B. ALGORITHM & FLOW CHART

The aspects of university activities that are subject to control are shown schematically in Picture 1.

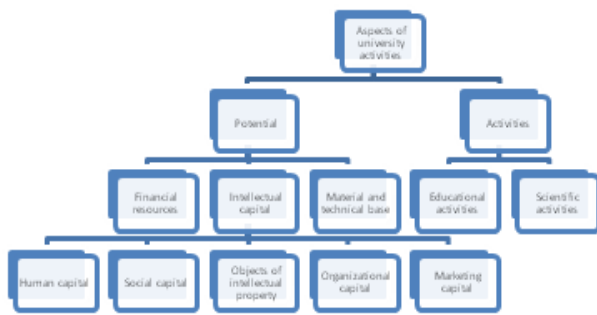
University potential as an object of control includes intellectual capital (A), material and technical base (B), and financial resources (C).

A. Intellectual capital of the university is a collective concept for the designation of the entire set of elements of intangible potential, as well as the system of economic relations in its use to create an educational and scientific product in accordance with the main goal of the university.

The human capital includes:

- individual knowledge, skills, and abilities;
- contracts with scientific and pedagogical workers, staff and managers of the university;





Picture 1.

- total university workforce;
- university corporate knowledge.

The organizational component of intellectual capital is associated with the functioning of the educational and scientific activities of the university. It includes infrastructural (organizational) capital and intellectual property of the university.

Infrastructure (organizational) capital is a combination of the following elements:

- Organizational structure;
- control system;
- the advanced training system of scientific and pedagogical workers and staff of the university;
- informational technology and resources;
- educational technologies (techniques) and knowledge management technologies.

The objects of the university intellectual property are:

- objects of copyright;
- objects of patent law;
- production rights (know-how).

Unlike the client capital of a business, the marketing component of intellectual capital is not an objective but plays a supporting role in the university's activities. Elements of marketing capital are directly related to operations in the market of educational services and products of scientific activity, as well as ensuring the competitive advantages of the university in these markets.

Fundamentally, the marketing capital of a university includes the following components:

- means of individualization, licenses, and accreditation;
- commercialization system of the results of the university's intellectual activity;
- system of attracting applicants;
- portfolio of orders for educational services and research work;
- bases for the employment of graduate students;
- business reputation (brand);
- the professional reputation of leading teachers and researchers of the university.

The role and structure of the university's social capital are determined by its specificity as a non-profit organization, scientific and educational institution, that implements important public (social) functions. Based on this, social capital plays a base role in the structure of intellectual capital and in all activities of the university. The social capital of the university includes:

Internal social capital of the university

- university relationship models;
- university communication network;
- system of motivation and stimulation of university staff;
- social security system for university staff and students;

External social capital of the university

- university business relations;
- university participation in commercial partnerships and professional communities;
- university integration into the world and national economy;
- participation of the university in the cultural and social life of the community;
- university ranking positions (among applicants, employers, and in a professional environment).

B. *The material and technical base of the university* includes the following main components:

- Land plots, buildings, and construction with equipped educational and scientific rooms (classroom fund, employees' workplaces, etc.);
- means of education and upbringing;
- electronic educational and informational and printed resources.

In accordance with the requirements of state educational standards, the availability of legal rights of the university to land plots, buildings, construction with equipped educational and scientific rooms is one of the licensing requirements for an applicant for a license to carry out educational activities [2].

The means of training and education include devices, equipment, including sports equipment and inventory, tools, visual aids, computers, information and telecommunication networks, hardware, software, and audiovisual means and other material objects necessary for the organization of educational activities [3].

In educational institutions, to ensure the implementation of educational programs, libraries (including digital) are formed, providing access to professional databases, information reference, and search system, as well as other information resources. The library fund should be equipped with printed and (or) electronic educational publications (including textbooks and teaching aids), methodical and periodical editions on all academic subjects included in the implemented educational programs [3].

C. There are no special requirements for *the financial resources of universities*. They are subject to the same requirements as the financial resources of any non-profit organization.

The activity of the university as an object of control includes educational (A) and scientific activities of the university (B). *Educational activities of universities*. According to the legislation of the Russian Federation, education is a unified purposeful process of training and education and is a socially significant good. At the same time, learning is a purposeful process of organizing students' activities in mastering knowledge, skills, and competencies. And upbringing is an activity

aimed at personal development, creating conditions for self-determination and socialization of a student.

In accordance with the legislation of the Russian Federation [3], educational activities are understood as activities related to the implementation of educational programs. Universities can implement educational programs of higher education, such as undergraduate, specialty, graduate programs, training of highly qualified personnel, and additional professional programs.

As an independent object of control, the educational activities of universities as a whole is a business process that includes the following phases:

- “Entry” into educational activities;
- internal educational processes;
- structure of educational activities;
- the result of educational activities.

Scientific activities of universities. In accordance with the legislation of the Russian Federation, scientific (research) activity means activities aimed at obtaining and applying new knowledge, including:

- Fundamental research is an experimental or theoretical activity aimed at obtaining new knowledge about the main regularities of structure, functioning, and development of a human, society, and the environment;
- applied research- research aimed primarily at the application of new knowledge to achieve practical goals and solve specific problems;
- exploratory research- research aimed at obtaining new knowledge for the purpose of their subsequent practical application (oriented research) and (or) application of new knowledge (applied research) and conducted through the implementation of research works.

Scientific activity is the implementation of scientific or sci-tech projects that represent a complex of coordinated and managed activities aimed at obtaining scientific or sci-tech results, the implementation of which is limited by time and attracted resources [5, 7.16].

The scientific activity of universities as an independent object of control is a business process involving the phases of:

- “Entry” into scientific activities;
- internal processes of scientific activity;
- structure of scientific activity;
- the result of scientific activity.

Educational programs can be distinguished as an independent object of control. In accordance with the legislation of the Russian Federation [3], an educational program is a set of basic characteristics of education (scope, content, outcomes), organizational and pedagogical conditions and forms of certification, which are presented as a curriculum, academic calendar, curriculum work programs, courses, disciplines (modules), other components, as well as evaluation and teaching materials.

Despite the fact that the educational activity of the university is an activity for the implementation of educational programs, in foreign and domestic practice educational programs are considered as independent objects of control. The factors that determine the need to identify as separate objects of control “educational activities of the university as

a whole” and “educational programs” include the following:

- educational activities, in general, include an essential component of the educational process, which objectively cannot be limited only to the framework of educational programs;
- in accordance with the legislation of the Russian Federation, educational programs can be implemented by the university not only independently, but also through the network [3], i.e. together with other organizations that have the resources necessary for the implementation of and conducting education and industrial practice, and carrying out other types of educational activities [3]. In this case, the implementation of the educational program is beyond the scope of the university activities.

The main methodological tool of the educational program is the curriculum that defines the list, laboriousness, the sequence and distribution by periods of study of the academic subjects, courses, disciplines (modules), practice, and other types of educational activities [3].

III. RESULTS AND DISCUSSION

Taking into account all the above material, the authors have formed a matrix of control objects of the university activities. The matrix is presented in Table 1.

Table 1. The matrix of control objects of university activities

| Levels for the formation of analytical indicators (control objects) | | | |
|---|----------------------------------|--|--|
| Level 1 | Level 2 | Level 3 | Level 4 |
| 1. Potential | 1.1. Intellectual Capital | 1.1.1. Human capital | 1.1.1.1. Individual knowledge, skills, and abilities |
| | | | 1.1.1.2. Contracts with scientific and pedagogical workers, staff and executives of the university |
| | | | 1.1.1.3. Total university workforce |
| | | | 1.1.1.4. University corporate knowledge |
| | | 1.1.2. Organizational (infrastructure) capital | 1.1.2.1. Organizational structure |
| | | | 1.1.2.2. Control system |
| | | | 1.1.2.3. System of employees advanced training |
| | | | 1.1.2.4. Informational technology and resources |
| | | | 1.1.2.5. Educational and knowledge management technologies |
| | | 1.1.3. Objects of intellectual property | 1.1.3.1. Objects of copyright |
| | | | 1.1.3.2. Objects of patent law |
| | | | 1.1.3.3. Production secret rights (know-how) |
| | | 1.1.4. Social capital | <i>Internal social capital</i> |
| | | | 1.1.4.1. University relationship models |
| | | | 1.1.4.2. University communication network |
| | | | 1.1.4.3. Motivation and stimulation system of university staff |
| | | | 1.1.4.4. Social security system for university staff and students |
| | | | <i>External social capital</i> |
| | | | 1.1.4.5. University's business connections |
| | | | 1.1.4.6. University participation in commercial partnerships and professional communities |
| | | | 1.1.4.7. University integration into the global and national economy |
| | | | 1.1.4.8. University participation in cultural and social life |
| | | | 1.1.4.9. University ranking position |
| | | 1.1.5. Marketing capital | 1.1.5.1. Means of individualization, license, accreditation |
| | | | 1.1.5.2. RIA Commercialization System |
| | | | 1.1.5.3. System of attracting applicants |
| | | | 1.1.5.4. Portfolio of orders for educational services and research work |
| | | | 1.1.5.5. Graduate students employment base |
| | | | 1.1.5.6. Business reputation (brand) of the university |
| | | | 1.1.5.7. The professional reputation of leading university lecturers and researchers |
| | 1.2. Material and technical base | 1.2.1. Land | |



Indicators of the Universities Control Activities

| | | | |
|-------------------------|---------------------------------------|--|--|
| | | 1.2.2. Buildings and construction | |
| | | 1.2.3. Means of education and upbringing | |
| | | 1.2.4. Printed and electronic educational and informational resources | |
| | 1.3. Finances | | |
| 2. Activity | 2.1. Educational activity | 2.1.1. "Entry" into an educational activity | |
| | | 2.1.2. Internal educational processes | |
| | | 2.1.3. Structure of educational activity | |
| | | 2.1.4. Result of educational activity | |
| | 2.2. Научная деятельность | 2.2.1. "Entry" into scientific activity | |
| | | 2.2.2. Internal processes of scientific activity | |
| | | 2.2.3. Structure of scientific activity | |
| | | 2.2.4. Result of scientific activity | |
| 3. Educational programs | 3.1. Higher education programs | 3.1.1. Undergraduate educational programs | |
| | | 3.1.2. Specialty educational programs | |
| | | 3.1.3. Master's educational programs | |
| | | 3.1.4. Educational programs for the preparation of highly qualified staff in postgraduate school | |
| | 3.2. Additional professional programs | 3.2.1. Professional development programs | |
| | | 3.2.2. Professional retraining programs | |

Source: compiled by the authors

The potential of the university as an object of control includes intellectual capital, material and technical base and financial resources. Accordingly, indicators designed to assess the potential of a university can be divided into three groups:

- Indicators of the assessment of intellectual capital of the university (A);
- Indicators of control of the material and technical base of the university (B);
- Indicators of the assessment of the university's financial resources (C) [6, 8, 13].

A. Indicators of the assessment of the intellectual capital of the university.

Indicators of human capital assessment. There are parameters of human capital that are of primary interest to the assessment of the effectiveness of the university's activities, such as the overall size and structure of human capital, its international integration, and quality (age and professional aspects).

Indicators of organizational (infrastructure) capital assessment as independent blocks include indicators of the assessment of organizational structure, management system, staff development system, the use of information resources and technologies, as well as educational and scientific technologies and methods.

Indicators of intellectual property assessment. The minimum amount of information characterizing the intellectual property of the university includes indicators of the number of results of the university's intellectual activity, which received legal protection, and taken on the balance as objects of intellectual property (in physical and monetary terms).

Indicators of social capital assessment are proposed to consider in two aspects:

- to assess its internal component, which closely correlates with the human and organizational components of intellectual capital, using indicators to assess the effectiveness of the relationship models at the university, university communication network, motivation and stimulation systems of university staff, as well as social security of university staff and students;

- to assess the effectiveness and efficiency of the interaction of the university with the external environment using indicators of the business relations assessment of the university, participation of the university in commercial partnerships and professional communities, integration of the university into the world and national economy, participation of the university in the cultural and social life of the society, and rating positions of the university.

The indicators of the university's marketing capital are aimed at assessing the effectiveness and efficiency of its main components, such as means of individualization, licenses, and accreditations, the university's RIA commercialization system, a system for attracting applicants, a portfolio of orders for educational services and research work, employment bases for graduate students, business reputation (brand) of the university, professional reputation of its leading teachers and researchers.

B. The main goal of **the control indicators of the material and technical base of the university** is the assessment of the adequacy and targeted use of material resources for the purposes of the university's statutory activities. They are stratified by control objects that are normatively regulated for universities.

For the land plots, the minimum set of indicators is related to its area and sources of financing. This object of control is particularly important for the assessment of the university activities of agricultural and technical orientation. For other universities, the land plots are designed to accommodate buildings and structures.

The main purpose of the indicators of buildings and structures is to assess their adequacy for the equipment of all necessary types of specialized facilities, and the qualitative implementation of educational and scientific activities (classroom fund, research facilities, recreation and nutrition of students, workplaces for scientific and teaching staff and other university staff, etc.).

The main emphasis in the selection of indicators of means of education and upbringing was focused on the assessment of the relevance of these tools in the era of IT technologies, as well as the wide use by students and the university's academic staff.

A similar emphasis was also used in the selection of indicators for controlling printed and electronic educational and information resources. But in this case, the composition of the indicators is formed based on the licensing and accreditation requirements for university libraries and also established standards for the use of printed educational and scientific publications.

C. Indicators of the assessment of the university's financial resources.



As it was mentioned above, the reason why the statutory activities of universities have the non-commercial nature is that incoming cash flows, including from the income-generating activities of universities, should be considered primarily as financial resources, sources of financing activities (ie, as elements of potential), and not as the results of this activity. In most cases of the special assessment, close attention is paid to the volume and structure indicators of sources of financing university's activities. As it was shown in the analysis, these estimates use the indicators per unit of students or university staff in order to compare the results and leveling the effect of the organization's size. At the same time, most often the objects of control and assessment are such financial indicators of university activities as the total amount of all incomes (financial receipts), income from income-generating activities (extrabudgetary income), funds allocated for research and development.

The university activity as an object of control includes the educational and scientific activities of the university. Accordingly, the indicators designed to control the processes of the university as an economic entity can be divided into two groups:

- Indicators of the effectiveness assessment of the university's
- Indicators of the effectiveness assessment of the university's

A. Indicators of the effectiveness assessment of the university's educational activities.

"Entry" into educational activities. For the purposes of the

the "entry" procedures in the university's educational activities classified into general intake procedures for the first level of higher education, special recruitment procedures for the first level of higher education, and recruitment procedures for subsequent higher education levels.

Organization of educational processes. When assessing the organization of educational processes, it is critical to single out as an object of control of the existing proportions of the educational process, educational periphery, and educational communications.

Structure of educational activity. The main directions of assessment of the structure of educational activities are to assess the contingent structure of students, primarily, in terms of implementing the requirements for improving the academic mobility of students. The structure of the contingent of students can be estimated based on the analytical tables, formed by the levels and directions of students preparation.

The results of educational activities. In terms of time, form and degree of identification of the contribution of a particular university, the results of educational activities of universities are proposed to be classified into the following groups:

- 1) The operational results are independent "intermediate" non-financial results obtained in the process of the current university activities, until the completion of the full cycle of student learning;
- 2) The direct target results are results that are the goal of the university, the contribution to the receipt of which by

this particular educational institution is obvious;

3) The financial results (the range of financial indicators covers legal commercial aspects of educational activities of universities);

4) The deferred synergistic results are results indirectly related to the activities of the university and manifested after a long time in the achievements of its graduates.

B. Indicators of the effectiveness assessment of the university's scientific activities.

"Entry" into scientific activities. In the world and domestic practice, the main criteria for "entering" into scientific activity (beginning of scientific research) are the allocated amounts of funding.

Organization of the processes of scientific activity. When assessing the organization of processes of scientific activity, it is critical to single out as the subject of analysis the existing proportions of the scientific process, the infrastructure of scientific activity and communications of the scientific process.

Structure of the scientific activity. It is proposed to use indicators of the structure of the budget allocated for research in scientific areas as indicators of the structure of scientific activity assessment.

The results of scientific activities. In terms of time, form and degree of identification of the contribution of a particular university, the results of scientific activities are proposed to be classified into the following groups:

- 1) Operational results are independent "intermediate" non-financial results obtained in the process of the current activities of the university, the contribution of which is obvious;
- 2) Financial results;
- 3) The direct target results are non-financial results, which are the goal of the university, the contribution to the receipt of which by its employees is obvious;
- 4) The deferred synergistic results are results that are manifested after a long time as a result of the use of direct target results of university activities by the professional community or employees.

The educational programs can be distinguished as an independent object of control of university activities. Formally, the control indicators of the implementation progress of educational programs largely coincide with the indicators of the assessment of the effectiveness of the university educational activities. The main difference between control indicators of the implementation progress of educational programs is the purpose and degree of detail of the assessment. The main goal of educational activity indicators is to evaluate the effectiveness of the activities of the university as an economic entity. These indicators evaluate the effectiveness of each specific educational program separately. Practically, there are very often situations when certain educational programs of a prestigious and efficiently operating university are not demanded by the market or have lost their relevance. It is more expedient to close them or necessary to conduct a serious restructuring. That is why operational monitoring indicators are needed for timely management decisions.



The control indicators of the implementation progress of higher education are proposed to be stratified by the levels of higher education programs (bachelor degree, specialty, master degree, and postgraduate degree) and within each level of educational programs, according to the technological stages of the educational process (admission to the educational program; organization of education on the program; learning outcomes of the program).

Most of the proposed indicators are the same for all levels and reflect the commonality of all educational programs of higher education. In this case, the specifics of the technological stage of the educational process comes forward.

Thus, the indicators of admission to the educational program are aimed at measuring the reputation of the program in the external educational environment. For this purpose, the competition indicators of the program by priority applications, the actual contingent enrolled in the program, the demand for the program from “commercial”, foreign and targeted applicants (who usually “vote for the quality of education with money and time”) are used.

Indicators of the organization of training in the program are designed to assess the level of technological effectiveness of the business processes of the program in the modern global information society. At the same time, this manufacturability is measured both according to formal features (specific time weights of the program implemented with the use of information technologies, in a network format, and in foreign languages) and based on qualitative measurements (compliance with professional standards and student satisfaction).

Indicators of learning outcomes of the program are designed to assess the ratio " ", which is the base for analyzing the effectiveness of any object. They measure both the amount of money earned by the program and the quality of its “finished product”, which reflects the degree of the achievement of the goals of the educational program.

A smaller part of the proposed indicators is designed to assess the specificity and purpose of each of the levels of educational programs of higher education. In this case, the level of educational programs of higher education comes forward.

For example, for bachelor and specialist degrees, the reputation in the external environment is measured primarily by the number of prize-winners of high school olympiads enrolled in the program, as well as the average score of the Unified State Exam. The target results, reflecting the quality of the program, are the percentage of graduates who work in the specialty in the first year after graduation, as well as the average salary they work for.

For graduate education programs, reputation in the external environment means its demand among students who graduated from other universities (including foreign ones). The target result is not so much employment as such (the vast majority of the master students are already working), but in raising their career and salary expectations.

Based on the purpose of the postgraduate study, the main target results of educational programs for training highly qualified personnel and indicators of its control are the number of graduate students of the program who joined the scientific and pedagogical workers of the university, the

percentage of graduate students who protected their diplomas no later than one year after graduation, and the number of publications in leading domestic and foreign peer-reviewed scientific publications of graduate students of the program.

The control indicators of progress implementation of additional professional education programs are designed to “measure” financial (the amount of money earned in various analytical sections) and reputational (number of students in various analytical sections, professional and public accreditation of programs, employers' satisfaction with the quality of training) the effect of the implementation of advanced training and retraining programs by the university.

The variety of forms of external control of university activities and, as a result, the fragmentation and disunity of the indicators used in their conduct, creates difficulties in the convergence of various types of control and also does not allow to get a holistic picture of the university’s performance.

IV. CONCLUSION

The article identifies and analyzes the main objects of control of universities activities. Its constituent elements have been studied in detail and disclosed.

Based on the results of the study, the authors proposed a matrix of control objects of university activities, which can serve as a methodological basis for building a management system in both Russian and foreign universities.

The results of the study indicate that the control indicators are used in all types of control over the activities of universities. Various systems of these indicators are used in different types of control, depending on their goals and objectives. The most comprehensive and detailed set of indicators is used in the system of internal control of university activities.

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Elena V. Nikiforova – Vice Head of the Accounting, Analysis and Audit Department of the Financial University under the Government of the Russian Federation (Moscow), Doctor of Economic Sciences (Advanced Doctor), and Professor. She is the author of more than 100 scientific publications like monographs, textbooks, articles, created both personally and in collaboration over the past 20 years.

The research interests are the application of the concept of intellectual capital in the theory and practice of university management, of accounting methodology, economic analysis, auditing, and assessment; problematic issues of legal regulation, accounting and audit of intangible assets of commercial organizations and universities; financial analysis in the audit; development of the indicators system of financial analysis: integral and local indicators; and assessment of the effectiveness of state financial control.

Member of the editorial board of the scientific and practical journal "Economics. Business. Banks"



Irina V. Safonova - Deputy Dean for Projects and Scientific Work of the Faculty of Accounting and Audit of the Financial University under the Government of the Russian Federation (Moscow), Ph.D. in Economics, and Associate Professor. She graduated from the Financial Academy under the Government of the Russian Federation in 1999.

She is the author of more than 80 scientific publications like monographs, textbooks, articles created both by her and in collaboration in the past 19 years.

The research interests are reforming accounting and law in modern Russia, development of accounting, economic analysis, audit and assessment methodology; problematic issues of legal regulation, accounting, and audit of property and obligations of commercial organizations; the use of mathematical methods in financial analysis, and development of the indicators system of financial analysis.

AUTHORS PROFILE



Roman P. Bulyga - Head of the Accounting, Analysis and Audit Department of the Financial University under the Government of the Russian Federation (Moscow), Doctor of Economic Sciences (Advanced Doctor), and Professor. He is the author of more than 120 scientific publications like monographs, textbooks, articles, created both personally and in collaboration over the past 20 years.

The research interests are the application of the concept of intellectual capital in the theory and practice of management of commercial organizations and universities, of accounting methodology, economic analysis, auditing, and evaluation; problematic issues of legal regulation, accounting, and audit of intangible assets of commercial organizations and universities; financial analysis in the audit; development of the indicators system of financial analysis; integral and local indicators; assessment of the effectiveness of state financial control.

Chief editor of the journal "Accounting. Analysis. Audit" of the Financial University, the chief editor of the journal "Economics. Business. Banks", and member of the editorial board of the scientific and practical journal "Auditor".