

## Legal frameworks for scientific research projects and commercialization activities in higher education institutions

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### Abstract

This topic analyzes the legal foundations of research projects carried out in higher education institutions and the commercialization of their results. The study examines national legislation, regulatory and legal acts governing innovative activities in universities and research institutes, as well as mechanisms for the protection of intellectual property. It also addresses the legal aspects of implementing scientific developments in practice, supporting startup projects, and forms of cooperation based on public-private partnerships. In the article supreme education in institutions scientific research and commercialization activity to efficiency impact and his/her legal basics brought passed. This research scientific financing observed effects to study aimed at to research contribution Addictive

**Keywords:** High Education; Institution; Scientific Research; Project; Work-Services; Investment; Commercialization; Research Funding; Scientific Efficiency; Dynamic Assessment; Legal Basis

### 1. Introduction

The study of the scientific and theoretical foundations of the organization and financing of higher education has a long history. Although the organization and financing of higher education have been among the most widely researched issues since the emergence of modern education systems, approaches to these matters have evolved in line with the stages of educational development.

Economic literature contains a substantial body of research by foreign scholars devoted to the financing of higher education institutions. In most of these studies, the central issues are identified as ensuring sustainable financing of education and improving its quality.

Presidential Decree No. PD-158 of September 11, 2023, "Uzbekistan — 2030 Strategy," sets out target indicators to be achieved by 2030 for the further development of higher education. Several of these indicators are particularly relevant to the present study. They include:

- increasing the gross enrollment rate of youth in higher education to at least 50 percent;
- improving the effectiveness of scientific research in higher education institutions and raising scientific potential to 70 percent;
- transforming five higher education institutions into national research universities;
- allocating 3 trillion UZS for the implementation of fundamental research;
- directing 4 trillion UZS from the State budget to applied research and, as a result, creating more than 2,500 new scientific developments;

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- increasing the share of researchers under the age of 40 to at least 60 percent, doubling the average salaries of employees of scientific organizations, and other related measures [1].

These measures highlight the need to improve mechanisms for innovation activity and commercialization in higher education institutions, as well as to ensure the financial stability of their activities.

The Decree of the President of the Republic of Uzbekistan “On Improving the System of Public Administration in the Development of Scientific and Innovative Activities” defines several key priorities. These include developing strategies for priority sectors and industries based on scientific achievements and innovations, taking into account long-term scenarios of the country’s innovative development; strengthening the intellectual and technological potential of regions and creating modern infrastructure for scientific and innovative activity; coordinating the system of training highly qualified scientific personnel; introducing effective mechanisms for involving young people in scientific and innovative activities and providing comprehensive support for their initiatives; expanding and strengthening international cooperation in science and innovation; and implementing measures aimed at the transfer of innovations and technologies [2].

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## 2. Literature review

High education in institutions scientific research projects and commercialization issues on the surface foreigner and our country of scientists row their research to bring possible

In his research, J. Panigrahi examines the challenges of applying innovative approaches to financing higher education in developing countries, using India as a case study. According to his findings, the gradual reduction of state funding for higher education institutions, along with the privatization of public universities, constitutes newly adopted innovative methods for financing higher education in developing countries such as India [3].

In his research, T. Gabrichidze emphasizes that effective financing of higher education can serve as a key factor not only in its development but also in enhancing quality, efficiency, and equity [4].

O. Qurbonov, in his analysis of financing sources in higher education, expresses the following view: “The financing of higher education institutions’ activities is carried out through the state budget, tuition fees (contract payments), international grants, and private sector investments; he also emphasizes the need for the efficient allocation of funds and the rational use of financial resources.” [5].

According to M. Umarova and M. Sultanboyeva, the methods of financing higher education vary across countries depending on the state’s economic conditions, social needs, and the demand for educational quality. They further note that financing models suitable for Uzbekistan’s higher education system include financial cooperation between the state, students, and the private sector, as well as the efficient allocation of resources, which serve as key sources for financing educational projects [6].

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## 3. Research methodology

The research employed methods such as induction and deduction, systematic analysis, statistical analysis, and scientific abstraction in the process of studying, analyzing, and examining the subject. In particular, the method of scientific abstraction was used to draw conclusions regarding the commercialization process in universities in Great Britain. Based on these conclusions, scientifically grounded proposals and practical recommendations were developed for improving the activities of higher education institutions in our country.

### 3.1. Analysis and results

In the Presidential Decree of the Republic of Uzbekistan “On Improving the System of Public Administration in the Development of Scientific and Innovative Activities,” the following key tasks were defined: to develop strategies for advancing priority sectors and industries based on scientific achievements and innovations, grounded in long-term scenarios of the country’s innovative development; to enhance the intellectual and technological potential of regions and establish a modern infrastructure for the development of scientific and innovative activities; to coordinate the system of training personnel with advanced scientific degrees; to introduce effective mechanisms for engaging young people in scientific and innovative activities and to comprehensively support their initiatives; and to expand and strengthen international cooperation in the field of science and innovation, as well as to implement measures for innovation and technology transfer.

Higher education institutions in modern society make a significant contribution not only to teaching, but also to enhancing economic and scientific potential through the implementation and commercialization of research projects. Scientific research projects serve as a source of knowledge and innovation for universities, enabling the creation of new technologies, scientific methods, and practical solutions. At the same time, students and doctoral candidates actively participate in research projects, which helps them develop practical skills alongside theoretical knowledge. In this regard, universities perform not only an educational function but also play a key role in training qualified personnel.

When the results of scientific research projects are commercialized, they acquire economic value. This process brings universities closer to the economy and creates opportunities for the development of new patents, licenses, and spin-off companies. In this way, the commercialization of scientific research not only improves the financial sustainability of universities but also strengthens the country's innovative capacity. Through commercialization activities, universities cooperate with industry, which provides a practical training environment for students and researchers and ensures faster implementation of scientific results into practice.

In addition, research projects and commercialization activities play an important role in enhancing the international reputation of universities. Activities such as participation in international conferences, publication of articles in academic journals, and attraction of research grants strengthen the scientific image of universities and increase their competitiveness.

At the same time, through the commercialization of research results, universities generate sustainable financial resources, which in turn enable the funding of new research projects and contribute to improving the quality of scientific investigations.

Commercialization issues in higher education institutions refer to the set of challenges and opportunities associated with transforming scientific research and innovations of universities into economic value-generating activities. These issues currently play an important role in the development of the education and science sectors in many countries.

Commercialization is the process of converting scientific results, patents, inventions, technologies, and educational services into economic income through market-based mechanisms such as sales, licensing, or other forms of transfer. For higher education institutions, this represents an opportunity to apply their scientific potential in practice and ensure institutional financial sustainability.

In the era of globalization, introducing innovations into the education system is a decisive process. The modernization of education, transformation of its structure, and practical implementation of innovations are among the most pressing issues today. Studying the role of innovative development in individual growth, national progress, and the governance of civil society is of particular importance. In the current education system of Uzbekistan, significant attention is being paid to conducting scientific research and training modern pedagogical staff. The country has favorable opportunities for establishing a strong system of scientific research and the preparation of qualified academic personnel.

Commercialization is only one of the many approaches that universities may use to translate research into impact. Not all research conducted by universities is carried out with the intention of commercialization or is necessarily aligned with it.

A significant portion of academic research is undertaken to advance knowledge, develop theoretical understanding, and lay the groundwork for future achievements. It is important to recognize that commercialized research is not inherently more valuable or less important than other forms of research; rather, both types serve different but complementary purposes within the broader academic and innovation ecosystem.

On the basis of the Budget Code of the Republic of Uzbekistan, the Law "On Accounting," budget accounting standards, and other regulatory legal acts, the methodological foundations of accounting for scientific research projects and commercialization activities in higher education institutions have been established.

In international practice, not only public sector organizations but also higher education institutions apply IPSAS standards. An example of this is IPSAS 9 (Revenue from Exchange Transactions).

IPSAS 9 is part of the International Public Sector Accounting Standards and defines the rules for recognizing revenue from exchange transactions and its presentation in financial statements.

It applies to situations where an entity provides goods or services in exchange for other goods, services, or monetary consideration.

*3.1.1. Revenue recognition under this standard is based on the following conditions*

- The entity has a contractual right to receive revenue – the organization must be entitled to receive the income.
- The amount of revenue can be measured reliably – the revenue must be capable of being determined accurately and with reasonable certainty.
- It is probable that economic benefits will flow to the entity – future inflows of funds are expected.
- The significant obligations have been fulfilled – goods must be delivered or services rendered.

In the Republic of Uzbekistan, strengthening the development of science, innovation, and their integration with the economy is regarded as one of the priority directions of state policy. In this regard, Presidential Resolution No. PQ-3855, entitled “On Additional Measures to Increase the Effectiveness of Commercialization of Scientific and Scientific-Technical Activity Results,” was adopted, aiming to accelerate the implementation of scientific developments into practice and their transformation into economic value through market mechanisms.

*3.1.2. The main objectives of this Resolution are as follows*

- to improve the mechanisms for the commercialization of the results of scientific and scientific-technical activities;
- to align scientific developments with the needs of the real sector of the economy;
- to enhance the innovative activity of higher education institutions and research organizations;
- to strengthen the economic efficiency derived from scientific outcomes.

The Resolution defines a number of systemic tasks aimed at developing the commercialization of scientific results (Table 1).

**Table 1** Main directions of the Resolution “On Additional Measures to Increase the Effectiveness of Commercialization of Scientific and Scientific-Technical Activity Results” [7]

No.	Direction	Content
1	Institutional mechanisms develop	Commercialization with practitioner structures formation
2	Financial support	Commercialization projects financing sources expansion
3	University and scientific organization’s role	Universities and scientific of institutions economic independence increase
4	Encouragement mechanisms	Scientific employees and authors interest reinforcement
5	Innovative infrastructure	Technoparks, startups and spin-offs develop

*3.1.3. This Decision supreme education institutions scientific to the activity new approach current including*

- In the evenings created scientific developments commercialization independent activity direction as confession was done;
- Scientific from the results taken income authors and institution between distribution mechanisms marked;
- From commercialization falling funds of people from the budget outside income as black started.

This situation, own in turn, commercialization funds accounting account and internal control to the object turned and them right into account to take necessity to the surface brought.

The Presidential Resolution of the Republic of Uzbekistan No. PQ-3855 is an important regulatory and legal document aimed at developing the commercialization of scientific and scientific-technical activity outcomes. It has elevated the scientific, financial, and innovative activities of higher education institutions to a new stage of development. This Resolution serves as an important source in shaping the scientific and methodological foundations for accounting, financial management, and internal audit control of commercialization funds in higher education institutions.

In the Republic of Uzbekistan, the fundamental reform of the higher education system, increasing the competitiveness of universities, and transitioning them to a modern governance model are among the priority directions of state policy.

In this regard, on December 24, 2021, the President of the Republic of Uzbekistan adopted Resolution Nos. PQ-60 and PQ-61, which are aimed at granting broader academic, organizational-managerial, and financial autonomy to state higher education institutions.

Resolution No. PQ-60 "On Additional Measures to Ensure Academic and Organizational-Managerial Independence of State Higher Education Institutions" is aimed at improving the internal governance system of higher education institutions.

#### *3.1.4. In accordance with this Resolution [8]*

- higher education institutions (HEIs) were granted the right to independently design curricula and course syllabi;
- opportunities for the implementation of modern pedagogical and innovative technologies in the organization of the educational process were expanded;
- HEIs were granted the authority to make independent decisions on optimizing their organizational structure, as well as reorganizing the activities of faculties and departments;
- the powers of universities in the selection, evaluation, and incentive mechanisms of academic and teaching staff were significantly expanded.

In the Republic of Uzbekistan, the high level of dependence of higher education institutions (HEIs) on the state budget has limited their financial flexibility, innovative activity, and ability to respond promptly to market demands. Therefore, Resolution No. PQ-61, adopted on December 24, 2021, is aimed at transforming HEIs into financially independent, economically responsible, and result-oriented entities.

According to the research findings, the sources of funding for scientific research projects consist of a combination of state budget grants, contractual agreements with economic entities, foreign grants, internal university resources, and revenues generated from commercialization activities. The diversification of these sources is identified as a key factor in ensuring the financial stability of higher education institutions. In particular, commercialization revenues have been scientifically substantiated as a strategically significant financial resource that reflects the effectiveness of research activities.

The study demonstrates that, in terms of their economic nature, commercialization revenues represent extra-budgetary income of higher education institutions and should be recognized as an independent object of accounting. Separately accounting for commercialization funds, distinct from other financial sources, enhances financial transparency, enables the fair distribution of shares among researchers and authors, and provides university management with a reliable information base for making informed managerial decisions.

The research further reveals that Resolution No. PQ-61 has strengthened the legal framework for financial autonomy in higher education institutions, enabling independent management of extra-budgetary funds, including income from research and commercialization activities. This, in turn, necessitates the adaptation of the accounting system to new conditions, the classification of income and expenditures by type of activity and project, as well as the strengthening of the role of internal audit institutions.

Internal audit has been substantiated as an important control mechanism in higher education institutions, ensuring the targeted, efficient, and lawful use of funds allocated for scientific research and commercialization activities. A step-by-step procedure for internal audit has been developed, in which the content of the preparatory, verification, analytical, and reporting stages is examined from a scientific perspective. The timely identification of financial errors, legal inconsistencies, and risks through internal audit plays a significant role in maintaining the financial stability and institutional reputation of higher education institutions.

Furthermore, the research results indicate that the self-financing system introduced on the basis of Resolution No. 967 strengthens the interconnection between scientific activity, commercialization, and financial management in higher education institutions, thereby elevating the requirements for accounting and internal audit systems to a qualitatively new level. In this process, scientific research and innovative activity become directly linked to financial performance and increasingly serve as a key factor in the long-term development strategy of universities.

Resolution PQ-61, titled "On Measures to Grant Financial Independence to State Higher Education Institutions," is aimed at fundamentally reforming the financial management system of higher education institutions (HEIs).

### 3.1.5. According to this resolution

- HEIs were granted the right to independently manage extra-budgetary funds;
- revenues generated from scientific research, economic contracts, and commercialization activities were retained at the disposal of the universities;
- budget estimate (smets) restrictions on the use of financial resources were gradually reduced;
- a system for assessing financial performance and efficiency in HEIs was introduced.

Resolution PR-61 has brought higher education institutions to a new stage of financial governance, transforming them from budget-dependent executors into independent economic entities. This resolution has created a strong regulatory and legal foundation for financing scientific research, accounting for commercialization revenues, and ensuring control through internal audit mechanisms within HEIs.

The Resolution of the President of the Republic of Uzbekistan dated 6 July 2022 No. PR-307, “On Organizational Measures for the Implementation of the Innovation Development Strategy of the Republic of Uzbekistan for 2022–2026,” is an important normative legal act aimed at advancing the country’s innovation development to a new stage. This resolution serves to ensure the practical implementation of the priority tasks set out in the Presidential Decree “On Approval of the Innovation Development Strategy of the Republic of Uzbekistan for 2022–2026.”

The resolution defines specific organizational mechanisms for implementing the innovation development strategy, with particular emphasis on state support for innovative activities, the commercialization of research results, and the development of startups and innovative projects. In particular, a “roadmap” for the implementation of the strategy for 2022–2023 was approved, outlining a comprehensive set of measures aimed at accelerating innovative activity.

Within the framework of this resolution, specific lists of innovation developments and startup projects to be implemented in the Republic of Karakalpakstan, regions, and the city of Tashkent were approved. This contributes to ensuring regional innovative development, the introduction of scientific developments into real sectors of the economy, and the enhancement of innovative activity across regions.

The resolution also identifies priority projects aimed at establishing the production of new innovative products in the real sector of the economy, and approves a list of “driver” innovation projects for the period 2023–2026. This approach is directed toward strategic planning of innovation development and ensuring long-term economic growth.

Furthermore, the role of higher education institutions and scientific organizations in innovation development is specifically defined in the resolution. In particular, clear tasks are assigned regarding the commercialization of scientific developments created in research institutions and universities, the establishment of spin-off companies, and the development of science-intensive production. This contributes to strengthening the “education–science–industry” integration and enhancing the innovative capacity of higher education institutions.

The responsibilities of the relevant ministries and agencies for ensuring the implementation of the resolution are clearly defined, with the Ministry of Innovative Development designated as the main coordinating body responsible for overseeing the execution of the strategy. In addition, a system of monitoring and control has been introduced to ensure the timely and effective implementation of the planned measures.

In the Republic of Uzbekistan, with the aim of modernizing the higher education system, optimizing the financial burden on the state budget, and ensuring the economic sustainability of higher education institutions (HEIs), the Resolution of the Cabinet of Ministers No. 967 dated 3 December 2019, “On the Gradual Transition of Higher Education Institutions to a Self-Financing System,” was adopted.

This resolution is aimed at transforming HEIs from a traditional centralized budget financing model into financially independent and responsible institutions capable of operating based on their own revenues.

The main objective of the resolution is to gradually introduce financial autonomy in higher education institutions in order to enhance the efficiency of educational and research activities.

### 3.1.6. This objective is implemented through the following tasks:

- introducing self-financing mechanisms for higher education institutions (HEIs);
- increasing the share of extra-budgetary funds;

- strengthening efficiency and accountability in the use of financial resources;
- improving financial management, accounting, and internal control systems.

The Resolution No. 967 of the Cabinet of Ministers of the Republic of Uzbekistan dated 3 December 2019 is an important normative legal act aimed at the gradual transition of higher education institutions to a self-financing system, thereby contributing to their transformation into financially independent, economically efficient, and innovation-oriented institutions.

This resolution provides a significant theoretical and practical foundation for dissertation research on the financing of scientific research in HEIs, the accounting of commercialization revenues, and their control through internal audit mechanisms.

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#### 4. Conclusion

In conclusion, it can be stated that the issues of financing scientific research projects in higher education institutions (HEIs), the commercialization of scientific and scientific-technical activity results, as well as improving the accounting and internal audit control of these funds, have been comprehensively analyzed. During the study, the national regulatory and legal framework, foreign scientific approaches, and existing financial management practices were examined in an integrated manner.

The results show that, in the Republic of Uzbekistan, the Presidential Decrees No. PD-3855, PD-60, and PD-61 adopted in recent years, as well as the Resolution of the Cabinet of Ministers No. 967 dated December 3, 2019, constitute a unified set of systemic reforms aimed at transforming higher education institutions into financially independent, innovative, and competitive entities. These documents envisage a gradual shift of HEIs away from the traditional budget-dependent financing model toward functioning as economic entities capable of operating based on their own revenues.

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#### Compliance with ethical standards

##### *Disclosure of conflict of interest*

No conflict-of-interest to be disclosed.

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