ISSN: 1991-3494 (Print)
ISSN: 2518-1467 (Online)

SCIENTIFIC JOURNAL OF PEDAGOGY AND ECONOMICS

№3
2026

ISSN 2518-1467 (Online),
ISSN 1991-3494 (Print)

CENTRAL ASIAN ACADEMIC
RESEARCH CENTER

SCIENTIFIC JOURNAL OF PEDAGOGY AND ECONOMICS

PUBLISHED SINCE 1944

3 (421)

May – June 2026

ALMATY, 2026

Scientific Journal of Pedagogy and Economics
ISSN 2518-1467 (Online),
ISSN 1991-3494 (Print).
Owner: «Central Asian Academic Research Center» LLP (Almaty).
The certificate of registration of a periodical printed publication in the Committee of information of the Ministry of Information and Communications of the Republic of Kazakhstan
№ KZ50VPY00121155, issued on 05.06.2025
Thematic focus: *«publication of the results of new achievements inthe field of fundamental sciences»*
Periodicity: 6 times a year.
http://www.bulletin-science.kz/index.php/en/

Scientific Journal of Pedagogy and Economics
ISSN 2518-1467 (Online),
ISSN 1991-3494 (Print).
Меншіктенуші: «Орталық Азия академиялық ғылыми орталығы» ЖШС (Алматы қ.).
Қазақстан Республикасының Ақпарат және коммуникациялар министрлігінің Ақпарат комитетінде 05.06.2025 ж. берілген **№ KZ50VPY00121155** мерзімдік басылым тіркеуіне қойылу туралы куәлік.
Тақырыптық бағыты: *«іргелі ғылым салалары бойынша жаңа жетістіктердің нәтижелерін жариялау»*
Мерзімділігі: жылына 6 рет.
http://www.bulletin-science.kz/index.php/en/

Scientific Journal of Pedagogy and Economics
ISSN 2518-1467 (Online),
ISSN 1991-3494 (Print).

Собственник: ТОО «Центрально-азиатский академический научный центр» (г. Алматы).

Свидетельство о постановке на учет периодического печатного издания в Комитете информации Министерства информации и коммуникаций и Республики Казахстан
Nº KZ50VPY00121155 выданное 05.06.2025 г.

Тематическая направленность: *«публикация результатов новых достижений вобласти фундаментальных наук».*

Периодичность: 6 раз в год.

http://www.bulletin-science.kz/index.php/en/

CONTENTS

PEDAGOGY

ECONOMICS

МАЗМҰНЫ

ПЕДАГОГИКА

ЭКОНОМИКА

СОДЕРЖАНИЕ

ПЕДАГОГИКА

ЭКОНОМИКА

SCIENTIFIC JOURNAL OF PEDAGOGY AND ECONOMICS
ISSN 1991-3494
Volume 3.
Number 421 (2026), 609-626

https://doi.org/10.32014/2026.2518-1467.1225

IRSTI 06.73.15
UDC 657.6:614.2

© Madysheva M.Zh., Mazbayeva K.O., 2026.
K. Sagadiev University of International Business, Almaty, Kazakhstan.
E-mail: m.madysheva@gmail.com

COST AUDIT IN A COMMERCIAL HEALTHCARE COMPANY: ASSESSMENT OF EFFICIENCY AND TRANSPARENCY

Madysheva Madina — PhD student, K. Sagadiev University of International Business, Almaty, Kazakhstan,
E-mail: m.madysheva@gmail.com, https://orcid.org/0009-0004-0750-4540;
Mazbayeva Kuralai — PhD, K. Sagadiev University of International Business, Almaty, Kazakhstan,
E-mail: mazbayeva.k@uib.kz, https://orcid.org/0000-0002-9723.

Abstract. *The relevance of the study* is determined by the fact that, in the context of limited financial resources and rising costs in the healthcare system, the problem of increasing the efficiency and transparency of medical organizations, especially those operating on a commercial basis, is of particular importance. Increased competition, the need to ensure the quality of medical services and financial sustainability requirements necessitate the improvement of cost management and internal audit mechanisms. *The purpose of this study* is to provide a comprehensive assessment of the efficiency and transparency of expenses in a commercial healthcare enterprise based on the development and application of a system of integrated indicators. *The methodological basis of the research* includes methods of financial, structural, comparative and coefficient analysis, as well as approaches to indicator normalization and the construction of an integral efficiency index. The empirical base is represented by data from the company's internal financial and management reports for 2021–2025, including revenue indicators, cost structure and internal audit data. *The results of the study* revealed structural changes in the distribution of costs, characterized by an increase in administrative and IT costs while reducing the share of direct medical expenses. A deterioration in performance indicators was identified, including a decrease in profitability and cost efficiency, as well as an increase in costs per patient against a less significant increase in revenue. In addition, institutional limitations in the internal control system were identified, reflected in the insufficient transparency of individual financial transactions. At the same time, the positive impact of audit digitalization on improving the quality of control and reducing deviations from budget targets was confirmed. *The practical significance of the research* lies in the development of methodological tools for a comprehensive assessment of the efficiency and transparency of expenses, which can be used in internal audit, financial control and strategic management systems of medical organizations.

Keywords: cost audit, healthcare, cost efficiency, transparency of financial flows, internal audit, commercial medical organization, digitalization

For citation: Madysheva M.Zh., Mazbayeva K.O. Cost audit in a commercial healthcare company: assessment of efficiency and transparency. Scientific Journal of Pedagogy and Economics, 2026. — No. 3. — P. 609-626. DOI: https://doi.org/10.32014/2026.2518-1467.1225

К. Сағадиев атындағы Халықаралық бизнес университеті,
Алматы, Қазақстан.
E-mail: m.madysheva@gmail.com

КОММЕРЦИЯЛЫҚ ДЕНСАУЛЫҚ САҚТАУ КӘСІПОРНЫНДАҒЫ ШЫҒЫНДАР АУДИТІ: ТИІМДІЛІК ПЕН АШЫҚТЫҚТЫ БАҒАЛАУ

Мадышева Мадина — PhD докторанты, К. Сағадиев атындағы Халықаралық бизнес университеті, Алматы, Қазақстан,
E-mail: m.madysheva@gmail.com, https://orcid.org/0009-0004-0750-4540;
Мазбаева Куралай — PhD, К. Сағадиев атындағы Халықаралық бизнес университеті, Алматы, Қазақстан,
E-mail: mazbayeva.k@uib.kz, https://orcid.org/0000-0002-9723;

Аннотация. *Зерттеудің өзектілігі* қаржы ресурстарының шектеулі болуы және денсаулық сақтау жүйесіндегі шығындардың өсуі жағдайында медициналық ұйымдардың, әсіресе коммерциялық негізде жұмыс істейтін кәсіпорындардың шығындары тиімділігі мен ашықтығын арттыру мәселесінің ерекше маңызға ие болуымен айқындалады. Бәсекелестіктің күшеюі, медициналық қызметтердің сапасын қамтамасыз ету қажеттілігі және қаржылық тұрақтылыққа қойылатын талаптар шығындарды басқару және ішкі аудит тетіктерін жетілдіруді қажет етеді. *Осы зерттеудің мақсаты* интеграцияланған көрсеткіштер жүйесін әзірлеу және қолдану негізінде коммерциялық денсаулық сақтау кәсіпорнындағы шығындардың тиімділігі мен ашықтығын кешенді бағалау болып табылады. *Зерттеудің әдіснамалық негізін* қаржылық, құрылымдық, салыстырмалы және коэффициенттік талдау әдістері, сондай-ақ көрсеткіштерді нормалау және тиімділіктің интегралды индексін құру тәсілдері құрайды. Эмпирикалық база кәсіпорынның 2021–2025 жылдар кезеңіндегі ішкі қаржылық және басқарушылық есептілік деректерімен, оның ішінде кіріс көрсеткіштерімен, шығындар құрылымымен және ішкі аудит деректерімен ұсынылған. *Зерттеу нәтижелері* тікелей медициналық шығындардың үлесі төмендеген жағдайда әкімшілік және IT-шығындардың өсуімен сипатталатын шығындарды бөлудегі құрылымдық өзгерістерді анықтауға мүмкіндік берді. Табыстылықтың төмендеуі, шығыстар тиімділігі коэффициентінің нашарлауы және табыстың салыстырмалы түрде баяу өсуі жағдайында бір пациентке шаққандағы шығындардың ұлғаюы сияқты тиімділік көрсеткіштерінің төмендеуі белгіленді. Сонымен қатар, ішкі бақылау жүйесінде жекелеген қаржылық операциялардың ашықтығының жеткіліксіздігінен көрінетін институционалдық шектеулер анықталды. Аудитті цифрландыру бақылау сапасын арттыруға және бюджеттік көрсеткіштерден ауытқуларды төмендетуге оң әсер ететіні дәлелденді. *Зерттеудің практикалық маңыздылығы* медициналық ұйымдардың ішкі аудит, қаржылық бақылау және стратегиялық басқару жүйесінде қолдануға болатын шығыстардың тиімділігі мен ашықтығын кешенді бағалаудың әдістемелік құралдарын әзірлеумен айқындалады.

Түйін сөздер: шығыстар аудиті; денсаулық сақтау; шығыстардың тиімділігі; қаржы ағындарының ашықтығы; ішкі аудит; коммерциялық медициналық ұйым; цифрландыру

Университет Международного бизнеса имени К. Сагадиева,
Алматы, Казахстан.
E-mail: m.madysheva@gmail.com

АУДИТ РАСХОДОВ В КОММЕРЧЕСКОМ ПРЕДПРИЯТИИ ЗДРАВООХРАНЕНИЯ: ОЦЕНКА ЭФФЕКТИВНОСТИ И ПРОЗРАЧНОСТИ

Мадышева Мадина — докторант PhD, Университет Международного бизнеса имени К. Сагадиева, Алматы, Казахстан,
E-mail: m.madysheva@gmail.com, https://orcid.org/0009-0004-0750-4540;
Мазбаева Куралай — PhD, Университет Международного бизнеса имени К. Сагадиева, Алматы, Казахстан,
E-mail: mazbayeva.k@uib.kz, https://orcid.org/0000-0002-9723;

Аннотация. *Актуальность исследования* обусловлена тем, что в условиях ограниченности финансовых ресурсов и роста затрат в системе здравоохранения особое значение приобретает проблема повышения эффективности и прозрачности расходов медицинских организаций, особенно функционирующих на коммерческой основе. Усиление конкуренции, необходимость обеспечения качества медицинских услуг и требования к финансовой устойчивости обусловливают потребность в совершенствовании механизмов управления затратами и внутреннего аудита. *Целью настоящего исследования* является комплексная оценка эффективности и прозрачности расходов в коммерческом предприятии здравоохранения на основе разработки и применения системы интегрированных показателей. *Методологическую основу исследования* составили методы финансового, структурного, сравнительного и коэффициентного анализа, а также подходы к нормированию показателей и построению интегрального индекса эффективности. Эмпирическая база представлена данными внутренней финансовой и управленческой отчетности предприятия за период 2021–2025 гг., включая показатели выручки, структуры затрат, а также данные внутреннего аудита. *В результате исследования* выявлены структурные изменения в распределении расходов, характеризующиеся ростом административных и IT-затрат при одновременном снижении доли прямых медицинских расходов. Установлено ухудшение показателей эффективности, включая снижение рентабельности, коэффициента эффективности расходов и увеличение затрат на одного пациента при менее значительном росте доходов. Дополнительно выявлены институциональные ограничения в системе внутреннего контроля, выражающиеся в недостаточной прозрачности отдельных финансовых операций. Вместе с тем доказано положительное влияние цифровизации аудита на повышение качества контроля и снижение отклонений от бюджетных показателей. *Практическая значимость исследования* заключается в разработке методического инструментария комплексной оценки эффективности и прозрачности расходов, который может быть использован в системе внутреннего аудита, финансового контроля и стратегического управления медицинских организаций.

Ключевые слова: аудит расходов; здравоохранение; эффективность расходов; прозрачность финансовых потоков; внутренний аудит; коммерческая медицинская организация; цифровизация

Introduction. In modern conditions of development of the healthcare system, the issues of effective use of financial resources are of particular importance. The rising costs of medical services, the increasing complexity of organizational processes and the increasing demands on the quality of medical care necessitate the improvement of cost management mechanisms in both the public and commercial sectors. According to international studies, a significant proportion of healthcare costs can be inefficient, which is associated with excessive administrative costs, duplication of functions and insufficient financial control (World Health Organization, 2010; OECD, 2020).

Special attention in the scientific literature is paid to the problem of the cost-benefit ratio of medical organizations. According to the concept of value-based healthcare, efficiency is determined not by the amount of expenditure, but by the results achieved per unit cost (Porter and Teisberg, 2006; Kaplan and Porter, 2011).

In this context, the development of performance assessment tools that take into account both financial and clinical indicators is of key importance.

Ensuring transparency is an important aspect of cost management. Insufficient transparency of financial flows leads to reduced trust, increased risks of inefficient use of resources, and makes it difficult to conduct audits (Hood, 2006; Heald, 2018). In recent years, digitalization has played a special role in increasing transparency, making it possible to automate accounting and control processes, as well as improve the accuracy of management decisions (Goldfarb and Tucker, 2019).

Quantitative methods for evaluating the effectiveness of medical organizations are widely used in scientific practice, including Data Envelope Analysis and stochastic frontier, which identify inefficient elements of the system and identify reserves for improving productivity (Ozcan, 2014; Hollingsworth, 2021). However, most of the research focuses on the public health sector, while commercial medical organizations remain poorly understood.

In Kazakhstan, the effectiveness of healthcare financing is considered primarily at the macro level. Research shows the presence of structural imbalances in the allocation of resources, as well as the need to increase transparency and cost effectiveness (Kulkayeva, 2023; Zhumagulov et al., 2022). In the context of the introduction of compulsory social health insurance and the digitalization of the industry, the importance of developing internal control and audit tools at the level of individual medical organizations is increasing.

Despite the availability of a significant number of scientific papers, there remains a gap in the literature related to the lack of an integrated approach to assessing the effectiveness and transparency of expenses in commercial medical enterprises, taking into account both financial and institutional parameters. This determines the relevance of this study.

The aim of the study is to develop and test a methodological approach to the comprehensive assessment of the effectiveness and transparency of expenses in a commercial healthcare enterprise based on an integrated system of indicators.

To achieve this goal, the following tasks are being solved:

– analysis of the structure and dynamics of the company's expenses;

– assessment of the effectiveness of the use of financial resources;

– analysis of the level of transparency and quality of internal control;

– development of an integral cost efficiency indicator.

Literary review. The issues of cost efficiency and transparency in the healthcare system occupy a central place in modern research on healthcare economics and financial management. In conditions of limited resources and growing demand for medical services, the problem of rational allocation of financial flows and increasing their effectiveness is becoming particularly relevant.

According to research by David Cutler and Mark McClellan, the effectiveness of healthcare spending is determined not so much by the amount of funding as by the quality of management, the level of process coordination, and the institutional maturity of the system (Cutler, 2010; McClellan, 2011). The authors note that a significant part of the inefficient costs is associated with excessive administrative costs and lack of integration between clinical and financial processes.

The development of the concept of value-based healthcare, proposed by Michael E. Porter and Elizabeth Teisberg, has become one of the key areas of efficiency improvement (Porter and Teisberg, 2006). This approach involves shifting the focus from volume indicators to achieving clinical results at an optimal cost level. Modern research confirms that the implementation of this model helps to increase resource efficiency and reduce excess costs (Kaplan and Porter, 2011).

Significant attention in the scientific literature is paid to the issue of cost transparency as a factor in increasing accountability and management effectiveness. Christopher Hood (Hood, 2006) considers transparency as an institutional mechanism that reduces information asymmetry and increases confidence in management decisions. More recent studies (Heald, 2018) emphasize that transparency is directly related to the quality of budget control and the effectiveness of resource allocation.

Modern research focuses on the role of digitalization in the transformation of the cost management system. Avi Goldfarb and Catherine Tucker (Goldfarb and Tucker, 2019) have shown that digital technologies can reduce transaction costs, increase the accuracy of data analysis, and improve the quality of management decisions. In the context of healthcare, the introduction of digital platforms, electronic medical records, and automated audit systems contributes to increased transparency and reduced inefficient costs (Buntin et al., 2011).

Quantitative methods for evaluating the effectiveness of medical organizations are of particular importance. Data Envelope Analysis and stochastic Frontier (SFA) methods are widely used to analyze technical and allocation efficiency (Ozcan, 2014). In recent years, there has been a growing interest in integrating these methods with digital analytical tools, which allows for more accurate and comprehensive performance assessments (Hollingsworth, 2021).

According to the World Health Organization (WHO, 2010), 20% to 40% of healthcare costs may be ineffective. The main reasons are the irrational use of resources, duplication of functions, excessive administrative procedures and insufficient control. These findings are supported by more recent research (OECD, 2020), which highlights the need to move towards results-based financing models and strengthen internal audit mechanisms.

An important area of research is related to the institutional aspects of cost management in transition economies. According to the World Bank (World Bank, 2018), the key problems are insufficient transparency of procurement, weak digitalization and fragmented information systems. Similar conclusions are presented in studies on Central Asian countries, which note the need to modernize financial control systems and introduce modern audit tools.

In recent years, special attention has been paid to the integration of ESG approaches and principles of sustainable development into the healthcare management system. Research shows that transparency of expenses and efficiency of their use are becoming important elements of the sustainable development of medical organizations (Kruk et al., 2018). This is especially important in the context of increasing demands on the social responsibility of businesses and government agencies.

Despite a significant amount of research, a number of unresolved issues remain in the scientific literature. First, most of the work focuses on public health systems, while the commercial sector remains poorly understood. Secondly, there is no unified approach to the comprehensive assessment of cost effectiveness and transparency, taking into account both financial and institutional parameters. Thirdly, the effects of digitalization in the context of internal audit and cost management have not been sufficiently investigated.

Thus, the analysis of the literature shows that modern research focuses on three key areas: increasing cost efficiency through optimizing cost structures, developing transparency and accountability mechanisms, and introducing digital technologies into the financial management system. At the same time, there remains a scientific gap associated with the need to develop comprehensive methods for assessing the effectiveness and transparency of expenses in commercial medical organizations, which determines the relevance and scientific novelty of this study.

Of particular importance for this study is the analysis of scientific papers on the financing and effectiveness of the healthcare system in Kazakhstan. In the Russian literature, these issues are considered mainly from the perspective of macroeconomic analysis and institutional transformations.

For example, studies by Kazakhstani authors, including Kulkayeva (Kulkayeva, 2023), analyze regional differences in healthcare financing and justify the need for more efficient allocation of resources based on per capita standards (Kulkayeva, 2023). The author notes that significant cost differentiation between regions reduces the overall effectiveness of the system and requires improved planning mechanisms.

Kaibullayeva's works (Kaibullayeva, 2024) address the issues of financial support for primary health care and the impact of macroeconomic factors on the sustainability of the healthcare system (Kaibullayeva, 2024). It is emphasized that the existing financing model needs to be modernized, taking into account rising costs and changing demand patterns for medical services.

A comprehensive analysis of public and private healthcare spending is presented in research by domestic economists (Zhumagulov et al., 2022), which identifies the multi-source nature of financing (budget, MHI, private spending) and highlights problems with the effective use of funds. The authors point to the need to strengthen financial control and increase transparency of expenses.

Additionally, the work of Kazakhstani researchers (Shayakhmetova et al., 2021) focuses on institutional transformations of the healthcare system and the need to improve resource management efficiency in the context of industry reform. It is emphasized that the transition to more modern management models requires the integration of economic and managerial tools.

In a broader context, research shows that the level of healthcare financing in Kazakhstan remains below that of developed countries (World Bank, 2018), which limits opportunities to improve the quality of medical services and requires more efficient use of available resources. At the same time, modern reforms are aimed at developing insurance medicine, digitalization and increasing the availability of medical care.

Thus, domestic studies confirm the relevance of the problems of cost effectiveness and transparency in the healthcare system of Kazakhstan, however, in most cases they are focused on the macro level of analysis. At the same time, the issues of comprehensive cost-effectiveness assessment at the level of individual medical organizations, especially commercial ones, remain insufficiently developed, which determines the scientific significance and novelty of this study.

Materials and methods. This study uses an integrated approach to assessing the effectiveness and transparency of expenses of a commercial healthcare company based on a combination of quantitative and analytical methods. The methodological base of the research includes elements of financial analysis, management accounting, comparative analysis, as well as methods for normalizing indicators and constructing integral indexes.

The empirical basis of the study was data from the internal financial and management reports of a commercial medical company for the period 2021-2025. The sample includes indicators of revenue, total expenses, cost structures, as well as data on the number of patients served. Additionally, internal audit materials were used, reflecting the level of transparency of financial transactions and the degree of deviations from budget indicators.

The use of panel data over five years has made it possible to ensure comparability of indicators and identify dynamic changes in the structure and efficiency of expenditures.

A system of specific and relative indicators was used to assess the effectiveness of expenses. The main calculated dependencies are presented below.

The cost per patient indicator was calculated using the formula:

$$C_p = \frac{TC}{N}$$

Where:

C1 – cost per patient;

TC – total costs;

N – number of patients.

Revenue per patient is defined as follows:

$$R_p = \frac{TR}{N}$$

Where:

R1 – revenue per patient;

TR – total revenue of the enterprise.

The expenditure efficiency coefficient (operational efficiency) was determined as follows:

$$E = \frac{TR}{TC}$$

Where:

E – expenditure efficiency coefficient.

This indicator reflects the amount of revenue per cost unit and allows you to assess the overall economic performance of the company.

The following indicators were used to assess the transparency and controllability of financial flows:

• the proportion of transactions without complete documentation;

• Cost share without full traceability;

• the level of deviations from the budget indicators.

The share of non-transparent transactions was calculated using the formula:

$$T = \frac{N_u}{N_t} \times 100\%$$

Where:

T – level of non-transparent operations;

N1u1 – number of operations with violations;

N1t1 – total number of operations.

For a comprehensive assessment of the effectiveness and transparency of expenses, an integral index based on the normalization of key indicators has been developed. The index includes:

• costs per patient;

• Cost efficiency ratio;

• share of administrative expenses;

• Transparency indicators (deviations from the budget, the share of non-transparent operations).

The normalization of indicators was carried out according to the linear transformation formula:

$$X_{norm} = \frac{X - X_{min}}{X_{max} - X_{min}}$$

For indicators that have a negative impact on efficiency (for example, costs), reverse normalization was used.:

$$X_{norm} = \frac{X_{max} - X}{X_{max} - X_{min}}$$

The integral index was calculated as a weighted average of the normalized indicators:

$$I = \sum_{i=1}^{n} w_i \cdot X_i$$

Where:

I – integral efficiency index;

w_i – weight of the i-th indicator;

X_i – normalized value of the indicator.

The weighting coefficients were determined by the expert method, taking into account the importance of each indicator in the cost effectiveness assessment system.

A comparative analysis of the company's structural divisions was applied to identify internal reserves for improving efficiency. The cost efficiency coefficient (income) was used as the main indicator. /costs), which made it possible to classify divisions by efficiency levels (high, medium, low).

It should be noted that the results of the study are limited to the use of data from a single commercial enterprise, which may reduce the generalizability of the conclusions. In addition, some of the transparency indicators are based on internal audit data, which implies the presence of subjective assessments.

Results. In the course of the study, a comprehensive assessment of the effectiveness and transparency of expenses in a commercial healthcare enterprise was carried out on the basis of a developed system of indicators, including financial, operational and managerial indicators. The empirical base of the study is based on the company's internal financial statements, management accounting data, and internal audit results for the period 2021-2025, which ensured comparability of indicators and reliability of the results obtained.

The methodological approach to cost effectiveness assessment was based on a combination of structural, comparative, and coefficient analysis. In particular, key cost groups were identified, their dynamic assessment was carried out, and indicators of operational efficiency and transparency of financial flows were calculated. Additionally, the approach of rationing indicators was used for the subsequent formation of an integrated cost effectiveness assessment.

At the first stage of the study, an analysis of the cost structure of the enterprise was carried out, which makes it possible to identify key areas of use of financial resources and determine changes in their distribution over time. Table 1 shows the dynamics of the cost structure by main items.

Table 1 – Cost structure of a commercial medical company, %

Item of expenses	2021	2022	2023	2024	2025
Direct medical expenses	62,3	61,5	60,2	58,6	57,1
Administrative expenses	18,4	19,6	21,2	23,5	24,7
IT and digitalization	5,1	6,3	7,4	8,6	9,8
Purchase of equipment	9,2	8,8	8,5	7,9	7,3
Other expenses	5,0	3,8	2,7	1,4	1,1
Note: compiled by the author on the basis of the company's internal reporting					

An analysis of the data in table 1 shows a steady decrease in the share of direct medical expenses while increasing administrative and IT costs. This indicates a structural transformation of the management model, but indicates the risk of reducing clinic-oriented efficiency, since the reallocation of resources towards managerial and support functions may limit the potential for improving the quality of medical services.

An additional analysis revealed that the increase in administrative costs is associated with a more complex organizational structure of the enterprise, increased costs for management personnel, as well as increased requirements for internal control and reporting. In turn, the increase in digitalization costs reflects the processes of implementing accounting and control information systems aimed at increasing the transparency of financial transactions. However, at this stage, these investments have not provided a comparable increase in financial returns.

To assess the overall efficiency of the enterprise, a system of key financial and economic indicators was formed, presented in table 2.

Table 2 – Key performance indicators

Indicator	2021	2022	2023	2024	2025
Revenue, million tenge	4 250	4 580	4 920	5 140	5 350
Total expenses, million tenge	3 600	3 980	4 450	4 870	4 920
Net profit, million tenge	650	600	470	270	430
Profitability, %	15,3	13,1	9,6	5,2	8,0
Note: the author’s calculations					

To analyze the efficiency of resource use, specific indicators were calculated that make it possible to assess the cost-benefit ratio of an enterprise at the micro level. These indicators reflect not only the dynamics of the financial burden, but also the degree of economic return from the medical services provided. To analyze the effectiveness, specific indicators were calculated in Table 3.

Table 3 – Cost efficiency indicators

Indicator	2021	2022	2023	2024	2025
Costs per 1 patient, thousand tenge	185	198	224	241	225
Income per patient, thousand tenge	218	229	247	254	244
Efficiency coefficient (R/C)	1,18	1,15	1,11	1,06	1,09
Note: the author’s calculations					

The calculation of the indicators in Table 3 is based on the following ratios:

• costs per patient were defined as the ratio of total costs to the number of patients served;

• revenue per patient was calculated as the ratio of revenue to the number of patients;

• The cost efficiency ratio was defined as the ratio of revenue to total costs.

An analysis of the results shows that during the study period there is a steady upward trend in costs per patient: from 185 thousand tenge in 2021 to 225 thousand tenge in 2025 (with a peak value of 241 thousand tenge in 2024). At the same time, the increase in income per patient is less pronounced, which indicates a decrease in the marginal efficiency of resource use.

Special attention should be paid to the dynamics of profit per patient, which decreased by more than 2.5 times in 2024 compared to 2021 (from 33 to 13 thousand tenge). This indicates a significant decrease in the economic benefits of medical services provided in the context of rising costs.

The cost efficiency ratio (R/C) demonstrates a steady downward trend, decreasing from 1.18 to 1.06 in 2024. This means that for every tenge of costs, the company receives less and less revenue, reflecting a deterioration in operational efficiency. The slight recovery of the indicator in 2025 (to 1.09) is due to partial cost optimization and an increase in the volume of services provided.

In general, the results of table 3 confirm the previously identified trend: an increase in costs is not accompanied by a comparable increase in income, which leads to a decrease in the efficiency of the enterprise. This situation requires an in-depth analysis of the factors influencing the formation of costs, as well as the development of measures to increase their validity and controllability.

In order to identify the sources of inefficiency in more detail and identify internal optimization reserves, a comparative efficiency analysis was conducted at the level of individual structural divisions of the enterprise. This approach allows us to assess the heterogeneity of the distribution of financial resources and determine which functional areas generate the greatest economic return, and which, on the contrary, are characterized by low resource efficiency. The results of the comparative analysis are presented in Table 4.

Table 4 – Comparative effectiveness of divisions

Department	**Income/Cost Ratio**	**Efficiency Level**
Inpatient Department	1.24	High
Outpatient Clinic	1.18	Medium
Diagnostics	1.21	High
Administration	0.91	Low
IT Department	0.87	Low
Note: author's calculations.		

The low performance of administrative divisions indicates the availability of internal optimization reserves. In particular, efficiency coefficients below unity (0.91 and 0.87) indicate that the relevant departments generate costs that are not offset by the economic returns generated. This confirms the need to review the structure of management costs, optimize the number of administrative staff and improve the effectiveness of the use of IT resources.

At the same time, clinical and diagnostic departments demonstrate higher efficiency coefficients (1.18–1.24), which indicates their key role in generating corporate revenue and confirms their priority importance in the financial resource allocation system. The revealed differentiation of efficiency between departments indicates the presence of structural imbalances that require managerial intervention and the introduction of mechanisms for internal resource redistribution.

However, an assessment of the effectiveness of expenses cannot be complete without analyzing the level of their transparency and the degree of control over financial flows. The effective use of resources is directly related to the quality of the internal audit system, the completeness of the documentary support of operations and the ability to track the flow of funds at all stages.

In this regard, the next stage of the study is the analysis of transparency and cost control indicators, which allows us to identify institutional constraints and risks of inefficient use of financial resources. The results of this analysis are presented in table 5.

Table 5 – Transparency and control indicators

Indicator	Value
Share of procurements without full documentation, %	17
Share of transactions without full traceability, %	9
Share of budget deviations, %	12.8
After digitalization, %	6.3

The revealed deviations indicate the insufficient maturity of the internal control system. In particular, the high proportion of purchases without complete documentation (17%) indicates the presence of procedural gaps in the cost justification and coordination system, which increases the risks of inefficient use of financial resources. Additionally, it was found that 9% of transactions are characterized by a lack of full traceability, which limits the ability to conduct a full-fledged audit and reduces the transparency of financial flows.

A significant indicator of the effectiveness of the financial management system is the level of deviations from the budget, which amounted to 12.8% in the study period. This indicator reflects the insufficient accuracy of planning and monitoring the execution of financial indicators. At the same time, the results of the implementation of digital audit elements demonstrate positive dynamics: a decrease in deviations to 6.3% confirms the effectiveness of automation of monitoring and cost control processes.

Thus, the results of the analysis indicate that increased transparency and digitalization of control procedures are key factors in improving the quality of cost management. However, for a comprehensive assessment of cost effectiveness, it is necessary to integrate disparate indicators into a single analytical system that takes into account both financial and institutional aspects of management.

In order to summarize the research results and form a comprehensive assessment of cost effectiveness, an integral index was calculated based on the normalization of key indicators. The following parameters were included in the index structure: costs per patient, cost efficiency ratio (R/C), share of administrative expenses, as well as transparency indicators (share of unjustified operations and the level of deviations from the budget).

The normalization of indicators was carried out by linear transformation with the reduction of values to the range from 0 to 1, where higher values correspond to higher efficiency. The integral index was calculated as a weighted average of the normalized indicators, taking into account their relative importance.

The results of the integral index calculation are shown in Figure 1.

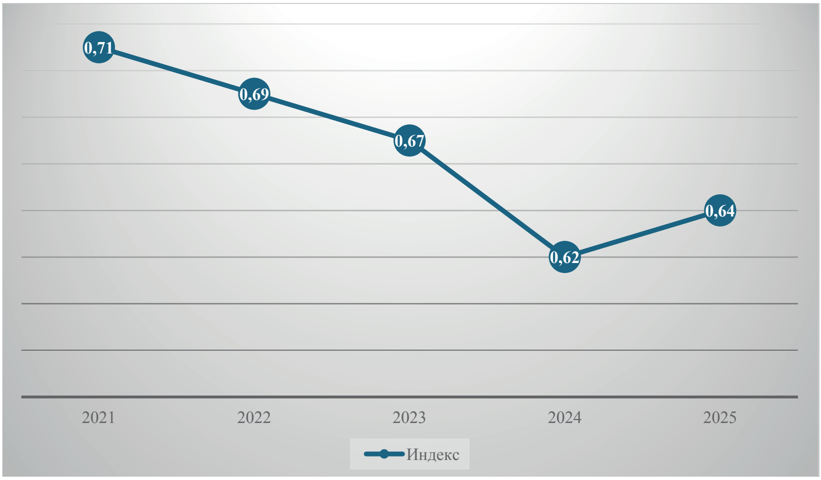

Figure 1 – Integral efficiency index

Note: the author's calculations

An analysis of the dynamics of the integral index shows its steady decline in the period 2021-2024, which indicates a systemic deterioration in the effectiveness of cost management. The minimum index value in 2024 (0.62) corresponds to the period of the greatest decrease in profitability and the maximum increase in costs, which confirms the consistency of the results obtained.

A slight improvement in the indicator in 2025 (to 0.64) is due to the partial introduction of digital control tools and optimization of individual cost items. Nevertheless, the current level of integrated efficiency remains below the initial values, which indicates the need for further improvement of the internal audit system and increased transparency of financial transactions.

Discussion. The obtained research results make it possible to identify the systemic features of the formation and use of expenses in a commercial healthcare enterprise, as well as identify key areas for improving their efficiency and transparency.

First of all, the revealed trend of increasing administrative and support costs while reducing the share of direct medical costs is consistent with the conclusions of a number of international studies, which emphasize that excessive administrative burden is one of the main causes of inefficiency in the healthcare system (Cutler, 2010; McClellan, 2011). This study found that the share of administrative expenses increased to 24.7%, which confirms the presence of a structural bias in the allocation of resources. This can lead to a decrease in clinic-oriented efficiency and limit the possibilities for improving the quality of medical services.

The results of the analysis of the cost efficiency ratio (R/C) and specific indicators also show a negative trend, expressed in a decrease in the economic return on costs. This conclusion corresponds to the concept of value-based healthcare, according to which effectiveness is determined not by the absolute level of costs, but by their ratio to the results achieved (Porter and Teisberg, 2006; Kaplan and Porter, 2011). In this case, an increase in costs per patient with a relatively moderate increase in income indicates a decrease in the marginal efficiency of resources.

Of particular interest are the results of a comparative analysis by departments, which revealed significant differentiation in efficiency. The high performance of clinical and diagnostic departments confirms their key role in generating revenue, while administrative and IT services show values below unity, which indicates the availability of internal optimization reserves. Such results are consistent with studies of the effectiveness of medical organizations, which note that auxiliary functions are often characterized by lower productivity and require optimization (Ozcan, 2014; Hollingsworth, 2021).

An important result is the identification of institutional constraints in the cost transparency system. The presence of transactions without complete documentation (17%) and limited traceability (9%) indicates the lack of maturity of the internal control system. These results confirm the conclusions of research in the field of public administration, according to which insufficient transparency leads to a decrease in the efficiency of resource allocation and an increase in management risks (Hood, 2006; Heald, 2018).

At the same time, the positive impact of digitalization on reducing deviations from budget targets confirms the thesis about the importance of digital technologies in improving management efficiency. The reduction in the deviation rate from 12.8% to 6.3% after the introduction of digital audit tools is consistent with the conclusions of modern research, which emphasizes that digitalization contributes to increased control accuracy, reduced transaction costs, and improved management decision quality (Goldfarb and Tucker, 2019; OECD, 2020).

The integrated cost effectiveness assessment made it possible to summarize the results obtained and identify a general downward trend in efficiency in the period 2021-2024. This result indicates the systemic nature of the identified problems and confirms the need for an integrated approach to cost management, including both financial and institutional measures.

From the point of view of practical conclusions, the results of the study indicate the need to implement the following areas of improvement:

– optimization of the cost structure with a reduction in the share of administrative costs;

– implementation of the principles of value-based management in the system of financing medical services;

– Strengthening the internal audit system and increasing the transparency of financial transactions;

– expanding the use of digital cost control and analysis tools;

– Implementation of a performance monitoring system at the department level.

In the context of Kazakhstan, the results obtained are of particular importance, since the national healthcare system is in the process of transformation associated with the development of compulsory social health insurance and the digitalization of the industry. Research shows (World Bank, 2018) that improving resource efficiency is a key condition for the sustainable development of the healthcare system in countries with economies in transition.

However, it should be noted that the results of the study have a number of limitations. Firstly, the analysis is based on data from a single enterprise, which limits the possibility of generalizing conclusions to the entire industry. Secondly, transparency indicators are partly based on internal estimates, which may affect the accuracy of the results. Thirdly, the integral efficiency index includes expert-defined weights, which can also introduce a subjective element.

Despite these limitations, the conducted research contributes to the development of methodological approaches to assessing the effectiveness and transparency of expenses in commercial medical organizations and can be used as a basis for further research in this area.

Conclusion. In the course of the study, a comprehensive assessment of the effectiveness and transparency of expenses of a commercial healthcare company was carried out based on a systematic analysis of financial, operational and managerial indicators. The integrated approach has made it possible to identify key trends in the cost structure, the level of their effectiveness, as well as the degree of transparency of financial flows.

The results showed a steady increase in total expenses with an outstripping increase in administrative and support costs, which was accompanied by a decrease in the share of direct medical expenses. This trend indicates structural imbalances in the allocation of resources and creates risks of reducing the clinical-oriented efficiency of the enterprise.

The analysis of financial and economic indicators revealed a deterioration in the cost-benefit ratio, which is reflected in a decrease in profitability and cost efficiency. It was found that the increase in costs per patient is not accompanied by a comparable increase in income, which confirms a decrease in the marginal efficiency of resource use.

A comparative analysis of the departments revealed a significant differentiation in efficiency, with clinical and diagnostic services demonstrating higher performance, while administrative and IT departments are characterized by low efficiency values.

This indicates that there are internal optimization reserves and the need to improve the cost management system.

An important result of the study is the identification of institutional constraints in the cost transparency system. The presence of transactions with insufficient documentation and limited traceability indicates the lack of maturity of the internal control system. At the same time, it was found that the introduction of digital audit tools significantly reduces deviations from budget targets and improves the quality of control.

The calculation of the integral efficiency index made it possible to summarize the results obtained and confirmed the downward trend in cost management efficiency in the analyzed period. This indicates the need for a comprehensive review of approaches to financial resource management in commercial medical organizations.

The practical significance of the research lies in the development of a system of indicators and methodological tools that allow for a comprehensive assessment of cost effectiveness and transparency. The proposed approaches can be used in the system of internal audit, financial control and strategic management of medical organizations.

The main directions for improving cost efficiency are proposed: optimizing the cost structure, implementing the principles of value-based management, increasing transparency of financial transactions and expanding the use of digital control tools. The implementation of these measures will increase the economic sustainability of medical organizations and ensure a more rational use of resources.

Thus, the results of the study contribute to the development of theoretical and applied aspects of cost management in healthcare and form the basis for further research aimed at improving financial control mechanisms and improving the efficiency of medical organizations.

References

Buntin M.B., Burke M.F., Hoaglin M.C., Blumenthal D. (2011) The benefits of health information technology: A review of the recent literature. Health Affairs, 30(3). — P. 464–471. https://doi.org/10.1377/hlthaff.2011.0178 (in Eng.)

Cutler D.M. (2010) Where are the health care entrepreneurs? Innovation Policy and the Economy, 11(1). — P. 1–28. https://doi.org/10.1086/656044 (in Eng.)

Goldfarb A., Tucker C. (2019) Digital economics. Journal of Economic Literature, 57(1). — P. 3–43. https://doi.org/10.1257/jel.20171452 (in Eng.)

Heald D. (2018) Transparency-generated trust: The problematic theorization of public audit. Financial Accountability and Management, 34(4). — P. 317–335. https://doi.org/10.1111/faam.12175 (in Eng.)

Hollingsworth B. (2021) Cost, production, efficiency, or effectiveness: Where should we focus? Health Economics, 30(3). — P. 597–601. https://doi.org/10.1002/hec.4211 (in Eng.)

Kaibullayeva A. (2024) Finansirovanie pervichnoi mediko-sanitarnoi pomoshchi v Respublike Kazakhstan [Financing of primary health care in the Republic of Kazakhstan]. Medicine and Ecology, 1. — P. 12–20. (in Rus.)

Kaplan R.S., Porter M.E. (2011) The big idea: How to solve the cost crisis in health care. Harvard

Business Review, 89(9). — P. 46–52. (in Eng.)

Kruk M.E., Gage A.D., Joseph N.T., Leslie H.H., Roder-DeWan S., Adeyi O., Barker P., Daelmans B., Doubova S.V., English M., García-Elorrio E., Guanais F., Gureje O., Hirschhorn L.R., Jiang L., Kelley E., Lemango E.T., Liljestrand J., Malata A. et al. (2018) Mortality due to low-quality health systems in the universal health coverage era: A systematic analysis of amenable deaths in 137 countries. The Lancet, 392(10160). — P. 2203–2212. https://doi.org/10.1016/S0140-6736(18)31668-4 (in Eng.)

Kulkayeva G. (2023) Analiz rashodov na zdravookhranenie po regionam Respubliki Kazakhstan dlya effektivnogo planirovaniya resursov [Analysis of healthcare expenditures by regions of the Republic of Kazakhstan for effective resource planning]. Ekonomika i statistika, 2. — P. 45–58. (in Rus.)

McClellan M. (2011) Reforming payments to healthcare providers: The key to slowing healthcare cost growth while improving quality? Journal of Economic Perspectives, 25(2). — P. 69–92. https://doi.org/10.1257/jep.25.2.69 (in Eng.)

OECD (2020) Health at a glance: Europe 2020. OECD Publishing. https://doi.org/10.1787/82129230-en (in Eng.)

Ozcan Y.A. (2014) Health care benchmarking and performance evaluation: An assessment using data envelopment analysis (DEA). Springer. https://doi.org/10.1007/978-1-4899-7472-9 (in Eng.)

Porter M.E., Teisberg E.O. (2006) Redefining health care: Creating value-based competition on results. Harvard Business School Press. (in Eng.)

Shayakhmetova K., Abdikarimova M., Tulegenova A. (2021) Institutsionalnye reformy zdravookhraneniya v Kazakhstane [Institutional reforms of healthcare in Kazakhstan]. Vestnik KazNU. Economics Series, 3. — P. 77–85. (in Rus.)

World Bank (2018) Delivering quality health services: A global imperative for universal health coverage. World Bank. https://doi.org/10.1596/978-1-4648-1327-1 (in Eng.)

World Health Organization (2010) Health systems financing: The path to universal coverage. WHO Press. (in Eng.)

Zhumagulov A., Nurpeisova G., Sadykova A. (2022) Finansirovanie sistemy zdravookhraneniya Kazakhstana: sovremennye tendentsii [Financing of the healthcare system in Kazakhstan: Current trends]. Bulletin of Economics, 4. — P. 33–41. (in Rus.)

Publication Ethics and Publication Malpractice in the journals of the Central Asian Academic Research Center LLP

For information on Ethics in publishing and Ethical guidelines for journal publication see http://www.elsevier.com/publishingethics and http://www.elsevier.com/journal-authors/ethics.

Submission of an article to the journals of the Central Asian Academic Research CenterLLP implies that the described work has not been published previously (except in the form of an abstract or as part of a published lecture or academic thesis or as an electronic preprint, see http://www. elsevier. com/postingpolicy), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. In particular, translations into English of papers already published in another language are not accepted.

No other forms of scientific misconduct are allowed, such as plagiarism, falsification, fraudulent data, incorrect interpretation of other works, incorrect citations, etc. The Central Asian Academic Research Center LLP follows the Code of Conduct of the Committee on Publication Ethics (COPE), and follows the COPE Flowcharts for Resolving Cases of Suspected Misconduct (http:// publicationethics. org/files/ u2/New_Code.pdf). To verify originality, your article may be checked by the Cross Check originality detection service http://www.elsevier.com/editors/plagdetect.

The authors are obliged to participate in peer review process and be ready to provide corrections, clarifications, retractions and apologies when needed. All authors of a paper should have significantly contributed to the research.

The reviewers should provide objective judgments and should point out relevant published works which are not yet cited. Reviewed articles should be treated confidentially. The reviewers will be chosen in such a way that there is no conflict of interests with respect to the research, the authors and/ or the research funders.

The editors have complete responsibility and authority to reject or accept a paper, and they will only accept a paper when reasonably certain. They will preserve anonymity of reviewers and promote publication of corrections, clarifications, retractions and apologies when needed. The acceptance of a paper automatically implies the copyright transfer to the Central Asian Academic Research Center LLP.

The Editorial Board of the Central Asian Academic Research Center LLP will monitor and safeguard publishing ethics.

Requirements for articles design for publication in the journal are available on the websites:

www: nauka-nanrk.kz
ISSN 2518–1467 (Online),
ISSN 1991–3494 (Print)
http://www.bulletin–science.kz/index.php/en

Managing Editor: A.Shormakova
Editors: D.S. Alenov, M.Konyrbekov
Computer layout: G.D. Zhadyranova

Signed for print: June 30, 2026
Format: 70×90 1/16. 48.0 printed sheets. Order No. 3

«Central Asian Academic Research Center» LLP
Almaty, Shevchenko Street, 28