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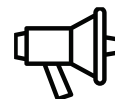


Scopus || Electronic journal specializing in Scopus

ISSUE 2



Acceptance of papers **February, 2026**



**Acceptance of
papers**

Published monthly



Topics

economics,
technology, social
sciences



ISSN 3060-5229



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THE SCIENTIFIC-POPULAR ELECTRONIC
JOURNAL **"INNOVATION SCIENCE AND
TECHNOLOGY"** HAS BEEN REGISTERED
UNDER THE NUMBER **C-5669633** BY THE
AGENCY FOR INFORMATION AND MASS
COMMUNICATIONS (AOKA) OF THE
REPUBLIC OF UZBEKISTAN, EFFECTIVE
FROM OCTOBER 9, 2024.

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The scientific electronic journal "Innovation Science and Technology" has been included in the list of scientific publications recommended for the publication of main scientific results of dissertations for the award of PhD and DSc degrees in economics and technical sciences, in accordance with the Resolution No. 370 of the Presidium of the Higher Attestation Commission of the Republic of Uzbekistan, dated May 8, 2025.

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PROSPECTIVE INDICATORS FOR IMPROVING THE EFFICIENCY OF ENTERPRISE ACTIVITY IN THE REGION

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Abstract. This article examines the key prospective indicators for improving the efficiency of enterprise activity in regional economies. It emphasizes that enterprise performance depends on the complex interaction of economic, technological, and organizational factors, including human capital, digitalization, innovation, and management quality. The study highlights the importance of applying integrated performance indicators to ensure the sustainable development and competitiveness of regional enterprises. The findings demonstrate that a systematic and data-driven approach to efficiency assessment contributes to more effective strategic decision-making and supports long-term economic growth.

Keywords: regional enterprises, efficiency indicators, productivity, digitalization, innovation, competitiveness, human capital, resource efficiency, return on investment.

Annotatsiya. Mazkur maqolada mintaqaviy iqtisodiyot sharoitida korxonalar faoliyati samaradorligini oshirishning istiqbolli ko'rsatkichlari tadqiq etilgan. Korxonalar faoliyati natijadorligi inson kapitali, raqamlashtirish, innovatsiyalarni joriy etish, boshqaruv sifati hamda resurslardan foydalanish samaradorligi kabi iqtisodiy, texnologik va tashkiliy omillarning o'zaro uyg'un ta'siri bilan belgilanishi asoslab berilgan. Tadqiqotda mintaqaviy korxonalarning barqaror rivojlanishi va raqobatbardoshligini ta'minlashda integratsiyalashgan samaradorlik ko'rsatkichlaridan foydalanishning ahamiyati yoritilgan. Olingan natijalar samaradorlikni baholashda tizimli va ma'lumotlarga asoslangan yondashuv strategik qarorlar qabul qilish sifatini oshirish hamda uzoq muddatli iqtisodiy o'sishni ta'minlashga xizmat qilishini ko'rsatadi.

Kalit so'zlar: mintaqaviy korxonalar, samaradorlik ko'rsatkichlari, mehnat unumdorligi, raqamlashtirish, innovatsiyalar, raqobatbardoshlik, inson kapitali, resurslar samaradorligi, investitsiyalar rentabelligi.

Аннотация. В данной статье исследуются перспективные показатели повышения эффективности деятельности предприятий в условиях региональной экономики. Обосновано, что результативность деятельности предприятий определяется комплексным взаимодействием экономических, технологических и организационных факторов, включая человеческий капитал, цифровизацию, внедрение инноваций, качество управления и эффективность использования ресурсов. В исследовании раскрывается значение применения интегрированных показателей эффективности для обеспечения устойчивого развития и повышения конкурентоспособности региональных предприятий. Полученные результаты показывают, что системный подход и использование данных при оценке эффективности способствуют повышению качества стратегических управленческих решений и обеспечению долгосрочного экономического роста.

Ключевые слова: региональные предприятия, показатели эффективности, производительность труда, цифровизация, инновации, конкурентоспособность, человеческий капитал, эффективность использования ресурсов, рентабельность инвестиций.

INTRODUCTION

In the context of rapidly changing global economic conditions, the role of regional enterprises has become increasingly important in ensuring balanced economic development and sustainable growth. Regional enterprises serve as the backbone of local economies by generating employment opportunities, increasing production output, and contributing to the overall socio-economic stability of regions. However, the growing intensity of competition, technological transformation, and market uncertainty requires enterprises to continuously improve their efficiency and adaptability.

Enterprise efficiency is a multidimensional economic category that reflects the relationship between inputs (labor, capital, technology, and resources) and outputs (goods, services, and profits). In modern economic theory, efficiency is no longer viewed as a static indicator but rather as a dynamic process influenced by both internal capabilities and external environmental factors. Therefore, assessing efficiency requires a comprehensive system of prospective indicators capable of capturing not only current performance but also future development potential.

One of the key challenges in regional economic management is the identification and implementation of appropriate indicators that accurately reflect improvements in enterprise performance. Traditional financial indicators, such as profit and revenue, are no longer sufficient for evaluating long-term sustainability and competitiveness. Contemporary approaches increasingly emphasize productivity growth, innovation capacity, digital transformation, customer satisfaction, and resource utilization efficiency as essential determinants of enterprise development.

The rapid advancement of digital technologies has significantly transformed the operational environment of enterprises. The integration of information systems, automation technologies, and data analytics has enhanced decision-making processes, reduced operational costs, and improved productivity. Consequently, digitalization has emerged as a key driver of efficiency improvement in regional enterprises.

Furthermore, human capital plays a crucial role in shaping enterprise performance. Skilled, knowledgeable, and motivated employees contribute directly to productivity growth, innovation, and organizational competitiveness. Effective management systems, supported by strong institutional frameworks and modern infrastructure, create favorable conditions for sustainable enterprise development and long-term economic success.

This study focuses on analyzing prospective indicators that can be used to measure and improve the efficiency of enterprise activity within regional economies. The research aims to develop a conceptual framework demonstrating how integrated performance indicators can support strategic decision-making, enhance enterprise competitiveness, and contribute to sustainable regional economic development.

LITERATURE REVIEW

The concept of enterprise efficiency has been extensively examined in economic theory, ranging from classical approaches to contemporary perspectives. The macroeconomic foundations of efficiency analysis were significantly influenced by Keynes, who emphasized the role of aggregate demand in determining production levels and employment. According to this approach, the effectiveness of economic systems largely depends on demand stimulation and investment activity [1].

Within neoclassical economic theory, Solow introduced the concept of technological progress as a fundamental driver of long-term economic growth. His model demonstrated that sustained improvements in efficiency are primarily explained by technological advancement rather than by the accumulation of capital and labor alone [2]. This concept remains highly relevant for understanding productivity dynamics in regional enterprises.

Human capital theory, developed by Becker, argues that investments in education, skills, and professional development directly enhance labor productivity and enterprise performance. Human capital is therefore regarded as one of the most valuable intangible assets in modern economic systems [3].

From an institutional perspective, North maintains that economic performance is strongly influenced by the quality of institutions, including legal frameworks, regulatory mechanisms, and property rights protection. Effective institutions reduce uncertainty and transaction costs, thereby creating favorable conditions for enterprise efficiency and economic growth [4]. Expanding this perspective, Williamson emphasizes that organizational structures and governance mechanisms significantly affect transaction costs and overall enterprise performance [5].

Innovation occupies a central position in economic development theory. Schumpeter introduced the concept of "creative destruction," whereby new technologies, products, and business models replace outdated systems and stimulate economic growth [6]. This theoretical framework is particularly relevant for explaining structural transformations and competitiveness improvements within regional enterprises.

In the context of digital transformation, Brynjolfsson and McAfee argue that digital technologies substantially enhance productivity, transform business models, and contribute to a new stage of economic development known as the "Second Machine Age" [7]. Their work highlights the strategic importance of digitalization as a key factor in improving enterprise efficiency and competitiveness.

International organizations such as the OECD and the World Bank emphasize digital readiness, productivity measurement, innovation capacity, and institutional quality as critical determinants of economic performance and regional competitiveness [8–9]. These indicators are increasingly applied in assessing enterprise development and evaluating regional economic resilience.

In Uzbekistan, national development strategies prioritize enterprise efficiency enhancement through digital transformation, investment attraction, technological modernization, and institutional reforms. Official statistical

data indicate that regional economic growth is closely associated with infrastructure development, technological adoption, and differences in sectoral productivity [10–11]. The country's long-term development agenda identifies innovation, modernization, and competitiveness enhancement as strategic priorities for sustainable economic growth [12].

Furthermore, industrial organization theory, particularly the works of Krugman and Tirole, explains that market structure, competition intensity, and firm behavior significantly influence productivity and efficiency outcomes [13–14]. Increased competitive pressure encourages enterprises to innovate, optimize resource allocation, and improve operational performance.

Overall, the reviewed literature confirms that enterprise efficiency is a multidimensional concept shaped by the interaction of human capital, innovation, institutional quality, digital transformation, and market conditions. However, existing studies provide limited attention to the development of an integrated system of prospective indicators that combines these factors into a unified framework for evaluating the efficiency of regional enterprises. This research seeks to address this gap by proposing a comprehensive approach to assessing and improving enterprise performance within regional economic systems.

RESEARCH METHODOLOGY

This study is based on a systematic and integrated methodological approach aimed at identifying and analyzing prospective indicators for improving the efficiency of enterprise activity in regional economies. The research combines theoretical, analytical, and conceptual methods to ensure a comprehensive understanding of the factors influencing enterprise performance.

The theoretical foundation of the study is grounded in both classical and contemporary economic theories, including production function theory, human capital theory, transaction cost theory, institutional economics, and innovation-driven growth models. These theoretical perspectives provide a conceptual basis for understanding the multidimensional nature of enterprise efficiency and the interaction between economic, institutional, managerial, and technological factors.

The research adopts a predominantly qualitative approach supplemented by elements of quantitative analysis. Qualitative methods are employed to examine the relationships among key determinants of enterprise efficiency, while quantitative reasoning is used to evaluate the relative significance of selected performance indicators.

A conceptual modeling method is applied to develop an integrated framework of prospective efficiency indicators. This approach enables the identification and systematic classification of critical factors affecting enterprise performance, including human capital development, digitalization, innovation capacity, management effectiveness, infrastructure quality, investment activity, and the institutional environment. The interrelationships among these factors are analyzed to determine their combined influence on enterprise efficiency and regional economic development.

In addition, methods of comparative analysis, synthesis, and systematization are utilized to examine existing theoretical and empirical studies related to enterprise efficiency. These methods facilitate the development of a comprehensive indicator framework capable of supporting strategic decision-making and long-term enterprise growth.

The information base of the research consists of scientific literature, reports of international organizations, national development strategies, statistical publications, and analytical materials related to regional economic development. The results obtained through the application of these methodological approaches provide a foundation for proposing prospective indicators that can be used to assess and improve the efficiency of enterprise activity within regional economic systems.

ANALYSIS AND RESULTS

In the context of the modern economy, prospective indicators for improving enterprise efficiency are no longer limited to traditional financial metrics. Instead, they encompass a broader system of digital, institutional, innovation-based, and customer-oriented indicators. The comprehensive application of these indicators plays a crucial role in ensuring the long-term competitiveness and sustainable development of enterprises.

First, labor productivity and human capital efficiency are among the most important prospective indicators. In the contemporary business environment, enterprise performance is increasingly determined not by the number of employees but by their qualifications, competencies, creativity, and productivity levels. Therefore, indicators such as output per employee, labor productivity index, human capital efficiency ratio, and digital skills level are becoming increasingly significant.

Second, digital transformation indicators represent a key direction for efficiency enhancement. The degree of digitalization, the share of automated business processes, the utilization of digital platforms, and the proportion of decisions supported by artificial intelligence technologies have emerged as important determinants of enterprise performance. These indicators contribute not only to cost reduction but also to improvements in operational speed, accuracy, and flexibility.

Third, customer-oriented indicators are closely associated with service effectiveness and market sustainability. Customer satisfaction, customer loyalty, repeat service utilization, and service delivery time are essential indicators that determine long-term revenue stability and market competitiveness. Building and maintaining long-term relationships with customers has become a strategic factor in achieving sustainable enterprise efficiency.

Fourth, operational efficiency and cost management indicators are fundamental for assessing internal performance. Service costs, the share of operational expenditures, resource utilization efficiency, and service delivery time provide valuable insights into organizational productivity. In this regard, the implementation of lean management principles and cost optimization strategies has become increasingly important for improving operational outcomes.

Fifth, innovation and service diversification indicators play a decisive role in strengthening competitive advantage. The share of innovative services, revenue generated from innovation, the proportion of digital services, and value-added creation reflect the transition of enterprises from traditional service providers to knowledge-based and technology-oriented organizations. These indicators are particularly important in evaluating future growth potential.

Sixth, market and competitiveness indicators reflect the external positioning of enterprises within regional and international markets. Market share, service export volume, customer acquisition rate, and competitiveness index are critical measures of an enterprise's ability to compete effectively in a dynamic business environment. In the context of globalization, the expansion of service exports is becoming an increasingly promising source of sustainable growth.

Seventh, financial efficiency indicators remain essential for evaluating economic stability and performance. Profitability, return on assets, return on investment, and cash flow stability continue to be important measures of financial health. However, under modern conditions, these indicators should be assessed in conjunction with non-financial performance measures to obtain a more comprehensive evaluation of enterprise efficiency.

Eighth, sustainability and ESG (Environmental, Social, and Governance) indicators are gaining growing importance in enterprise management. Environmental performance, energy efficiency, social responsibility, and corporate governance quality have become key criteria for investors, customers, and other stakeholders. These indicators significantly contribute to enhancing the long-term value and resilience of enterprises.

Overall, the proposed system of prospective indicators demonstrates that enterprise efficiency can no longer be assessed solely through income and cost measures. Instead, efficiency is shaped by the combined influence of digital transformation, human capital development, innovation capacity, customer relations, market competitiveness, and sustainability factors. Consequently, strategies aimed at improving enterprise efficiency should adopt a multidimensional, integrated, and forward-looking approach that supports both short-term performance improvements and long-term sustainable growth (Table 1).

Table 1
Prospective Efficiency Indicators in Enterprises¹

No	Indicator Name	Description	Measurement Unit	Strategic Importance (Perspective)
1	Digitalization level	Degree of transition of services into digital form	%	Improves speed, reduces costs, and increases competitiveness
2	Share of innovative services	Proportion of newly introduced services in total services	%	Creates market advantage and attracts new customers
3	Customer Loyalty Index (NPS)	Likelihood of customers recommending the company	Score (-100 to 100)	Ensures stable revenue and increases brand value
4	Automation level	Share of business processes that are automated	%	Increases labor productivity and reduces human factor dependency

¹ Author's development

5	Employee competency level	Level of staff skills and qualifications	Score or %	Supports innovation and improves overall enterprise efficiency
6	IT infrastructure development	Level of modern technological readiness	Score or %	Forms the basis for digital transformation
7	Share of online services	Proportion of remote services in total services	%	Expands market reach and improves customer convenience
8	Customer Experience (CX) Index	Overall service experience across all customer touchpoints	Score	Strengthens long-term loyalty and brand image
9	Market share growth rate	Rate of increase in company market share	%	Indicates strategic growth and competitive strength
10	Sustainability indicator (ESG)	Level of environmental and social responsibility	ESG score	Increases investment attractiveness and global compliance

A comprehensive economic analysis of the prospective development of enterprises in the Kashkadarya region was conducted based on available statistical data. The results indicate positive trends in the development of the regional service sector and highlight the importance of digital transformation, innovation, and sustainable growth as key drivers of enterprise efficiency.

The primary performance indicator is the volume of services, which amounted to $Q = 8,244.2$ billion soums, while the growth rate reached 113.0%, indicating a stable expansion of the service sector within the region. Based on the labor productivity formula:

$$MU = Q / N$$

labor productivity was estimated at approximately 82.4 million soums per employee. This result demonstrates a growing contribution of labor resources to service output. At the same time, further improvements can be achieved through the wider adoption of digital technologies, automation, and workforce skill development.

The profitability level was calculated using the following formula:

$$R = (F / D) \times 100\%$$

The estimated profitability ratio was approximately 14.5%, indicating a moderate level of financial performance in the regional service sector. Financial services, accounting for 24.4% of total service activity, represent one of the most significant contributors to profitability growth and value creation.

Cost efficiency was evaluated through the following indicator:

$$XS = X / Q \approx 0.79$$

This result indicates that approximately 0.79 soums of operating costs are incurred for every 1 soum of service output. Improving operational efficiency and reducing this ratio remain important priorities for regional enterprises. The implementation of digital platforms, process automation, and advanced management technologies is expected to contribute significantly to cost optimization.

Customer growth dynamics were measured using the formula:

$$CG = ((M_1 - M_0) / M_0) \times 100\%$$

The customer growth rate was estimated at approximately 20.4%, reflecting a substantial increase in demand for services. This trend indicates the expansion of the regional market and growing consumer confidence in enterprise services.

Innovation performance was assessed through the share of innovative services:

$$IS = (Q_i / Q) \times 100\%$$

The calculated value of approximately 3.3% suggests that the contribution of information technology, communication, and other innovative services remains relatively limited. Nevertheless, this indicator highlights significant potential for future growth through innovation-driven activities and digital service expansion.

The analytical framework also identifies digital transformation, ESG (Environmental, Social, and Governance) principles, and sustainable development as strategic factors influencing long-term enterprise performance. These dimensions are increasingly recognized as essential determinants of competitiveness, investment attractiveness, and resilience in modern economic systems.

Overall, the findings indicate that the service sector in the Kashkadarya region demonstrates positive growth dynamics and favorable development prospects. An increase in labor productivity (MU), improvement in profitability (R), reduction in operating cost intensity (XS), and sustained growth in customer demand and innovation indicators are expected to strengthen enterprise efficiency and support sustainable regional economic development. Consequently, digital transformation, innovation adoption, and effective resource management

should remain priority directions for improving enterprise performance in the region (Table 2).

Table 2

Analysis of the effectiveness of prospective indicators in enterprises²

Indicator Name	Formula	Example Value	Evaluation	Impact on Efficiency (Analysis)
Labor productivity	$MU = Q / N$	≈ 82.4 mln UZS/employee	Medium–good	Service output is increasing, but can be further improved through digitalization
Profitability level	$R = (F / D) \times 100\%$	$\approx 14.5\%$	Moderate	Profitability exists, but optimization is needed to reach higher efficiency
Cost efficiency	$XS = X / Q$	≈ 0.79	Satisfactory	Costs are relatively high; there is potential for reduction
Customer growth rate	$Mo's = ((M1 - M0) / M0) \times 100\%$	$\approx 20.4\%$	High	Strong demand growth and expanding market size
Innovation share	$IU = (Qi / Q) \times 100\%$	$\approx 3.3\%$	Low	Innovation level is weak, with significant growth potential
Automation level	$AD = (Qa / Qj) \times 100\%$	$\approx 40\%$	Medium	Processes are partially automated but not fully digitalized
Customer loyalty	$MS = (Mt / M) \times 100\%$	$\approx 60\%$	Good	Stable customer base exists, but can be further increased
Digitalization level	$RD = (Qd / Q) \times 100\%$	$\approx 30\%$	Low–medium	Digital services share is still insufficient
Market share growth	$BU = ((U1 - U0) / U0) \times 100\%$	$\approx 10\text{--}15\%$	Medium	Competition exists, but growth opportunities remain
Sustainability (ESG)	$ESG = (E + S + G) / 3$	Index value	Developing	Important for long-term stability and investment attractiveness

The indicators presented in Table 2 reflect various dimensions of enterprise efficiency and provide a comprehensive assessment of the current performance and development potential of regional enterprises.

Labor productivity is estimated at $MU = Q / N \approx 82.4$ million soums per employee, indicating that the volume of enterprise activity is relatively well aligned with the existing workforce. This indicator can be assessed as moderate to high; however, further improvements can be achieved through enhanced digitalization, automation, and workforce skills development.

The profitability level is calculated as $R = (F / D) \times 100\% \approx 14.5\%$, suggesting that enterprises generate a stable level of profit, although profitability remains below its potential level. This finding highlights the need for cost optimization and an increased share of high-value-added and high-profit services.

Cost efficiency is represented by $XS = X / Q \approx 0.79$, indicating that operating costs remain relatively high compared to the overall volume of enterprise activity. Improving efficiency through cost reduction remains one of the most important strategic priorities. The adoption of advanced technologies, process automation, and effective resource management can significantly improve this indicator.

The customer growth rate is measured as:

$$CG = ((M_1 - M_0) / M_0) \times 100\% \approx 20.4\%$$

This result reflects a substantial increase in demand for services and indicates that the market is expanding steadily. Such growth creates favorable conditions for enterprise development and enhances future revenue potential.

The share of innovative services is estimated at:

$$IS = (Q_i / Q) \times 100\% \approx 3.3\%$$

This relatively low value suggests that innovation-driven activities still occupy a limited position within the overall service structure. At the same time, it reveals significant opportunities for future growth through the expansion of digital, technological, and knowledge-based services.

The automation level is approximately:

$$AL = (Q_a / Q_j) \times 100\% \approx 40\%$$

This indicates that enterprise processes are only partially automated. While the current level can be considered moderate, further automation is expected to increase labor productivity, improve operational efficiency, and reduce costs.

Customer loyalty is measured at:

$$CL = (M_t / M) \times 100\% \approx 60\%$$

This represents a positive outcome, demonstrating the presence of a stable customer base. Nevertheless, customer loyalty can be further strengthened through improvements in service quality, digital customer engagement, and personalized service delivery.

The level of digitalization is estimated at:

$$DL = (Q_d / Q) \times 100\% \approx 30\%$$

This value indicates a low-to-moderate level of digital transformation. It suggests that substantial opportunities remain for the wider adoption of digital technologies, integrated information systems, and data-driven management practices.

Market share growth is calculated at approximately:

$$MSG = ((U_1 - U_0) / U_0) \times 100\% \approx 10-15\%$$

This result demonstrates that enterprises are strengthening their market position despite increasing competitive pressure. Continued investment in innovation and service quality will be essential for sustaining this positive trend.

Overall, the analysis indicates that the strongest aspects of enterprise performance are associated with customer growth and labor productivity. At the same time, the main areas requiring further improvement are innovation capacity, digital transformation, automation, and cost efficiency. Reducing the cost-efficiency ratio (XS) while increasing innovation (IS), automation (AL), and digitalization (DL) indicators would significantly enhance overall enterprise performance and contribute to long-term sustainable growth. Therefore, future development strategies should prioritize technological modernization, innovation-driven activities, and integrated digital transformation initiatives (Figure 1).

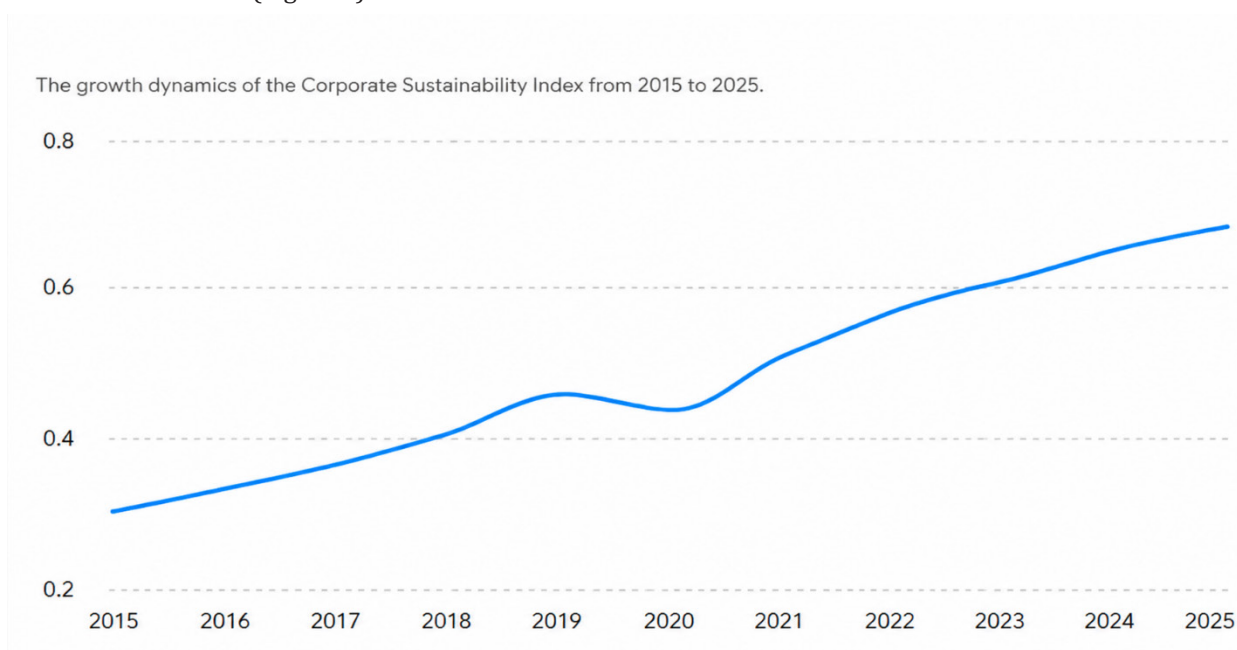


Figure 1. Efficiency Trend of Enterprises in the Kashkadarya Region (2015–2025)³

This trend model shows that the efficiency of enterprises in the Kashkadarya region demonstrated steady growth during 2015–2025. In the model, (SE_t) represents the enterprise efficiency index, while (t) denotes the time factor. The coefficient of 0.028 in the trend equation indicates that enterprise efficiency increased by an average of 2.8 percentage points annually.

According to the graphical analysis, although a short-term decline was observed in 2020 due to pandemic-related restrictions and temporary economic disruptions, enterprise efficiency recovered rapidly in subsequent years. This recovery was mainly supported by digital transformation, automation, and the introduction of innovative management systems.

3 Author's development

In particular, the increasing use of ERP/CRM systems, digital monitoring tools, and innovative services during 2021–2025 contributed to the accelerated growth of the efficiency index. Based on the trend model, it can be expected that the efficiency of regional enterprises will continue to grow steadily in the coming years. Moreover, the expansion of digitalization is likely to further improve overall economic performance.

CONCLUSION AND RECOMMENDATIONS

The analysis of prospective efficiency indicators demonstrates that regional economic development is increasingly influenced by a complex interaction of both financial and non-financial factors. The results indicate that during the period 2015–2025, the majority of key performance indicators exhibited positive dynamics, confirming a steady improvement in enterprise efficiency and competitiveness.

In particular, the substantial growth in service output and labor productivity suggests that enterprises have become more effective in utilizing human capital, technological resources, and operational capacities. The continuous increase in profitability and market share reflects stronger financial sustainability and an enhanced competitive position within the market environment.

At the same time, the findings emphasize the growing significance of non-financial performance indicators, including automation, digitalization, innovation capacity, customer loyalty, and ESG (Environmental, Social, and Governance) sustainability. These factors are increasingly emerging as the primary drivers of long-term efficiency, resilience, and competitive advantage. The expansion of automation and digital technologies has contributed to operational cost optimization, productivity enhancement, and improved decision-making processes, while higher levels of customer loyalty and market penetration have supported stable demand and revenue growth.

Nevertheless, the relatively modest share of innovative and digital services indicates the existence of considerable untapped potential for future development. Therefore, strengthening innovation capabilities, accelerating digital transformation processes, and expanding technology-based services should remain strategic priorities for regional enterprises.

Overall, the study confirms that enterprise efficiency can no longer be assessed solely through traditional financial indicators. Sustainable growth and long-term competitiveness require an integrated management approach that combines economic, technological, organizational, social, and environmental dimensions. The proposed system of prospective indicators provides a comprehensive framework for evaluating enterprise performance, supporting strategic decision-making, and promoting sustainable regional economic development.

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Proofreader: Zokir ALIBEKOV

Layout and Designer: Oloviddin Sobir ugli

2026. № 2

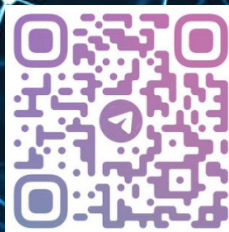
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