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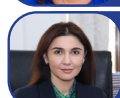
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METHODOLOGY FOR INCREASING THE EFFICIENCY OF CREDIT OPERATIONS IN COMMERCIAL BANKS

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Abstract: The efficiency of credit operations is a key factor determining the financial performance, asset quality, and stability of commercial banks. This study develops a comprehensive methodology for improving credit efficiency through integrated borrower assessment, risk-based pricing, digital credit scoring, portfolio diversification, continuous monitoring, and early-warning mechanisms. The research uses comparative, statistical, analytical, and system-based approaches based on official banking-sector data from the Central Bank of the Republic of Uzbekistan. The results show that Uzbekistan's total loan portfolio increased from UZS 533.1 trillion at the beginning of 2025 to UZS 604.0 trillion at the beginning of 2026 and reached UZS 636.0 trillion by June 1, 2026. The study emphasizes that credit efficiency should be assessed not only by loan growth but also by asset quality, risk-adjusted return, portfolio concentration, recovery efficiency, and post-lending monitoring.

Keywords: credit operations, commercial banks, credit efficiency, credit risk, loan portfolio, credit scoring, NPL, risk-based pricing, loan monitoring, banking sector.

Annotatsiya: Kredit operatsiyalarining samaradorligi tijorat banklarining moliyaviy natijalari, aktivlar sifati va barqarorligini belgilovchi muhim omillardan biridir. Mazkur tadqiqotda qarz oluvchilarni kompleks baholash, riskka asoslangan narxlash, raqamli kredit skoringi, kredit portfelini diversifikatsiya qilish, doimiy monitoring va erta ogohlantirish mexanizmlarini integratsiyalash orqali kredit operatsiyalari samaradorligini oshirish metodologiyasi ishlab chiqilgan. Tadqiqotda O'zbekiston Respublikasi Markaziy bankining rasmiy ma'lumotlari asosida qiyosiy, statistik, analitik va tizimli yondashuvlardan foydalanilgan. Natijalarga ko'ra, O'zbekistonda jami kredit portfeli 2025-yil boshidagi 533,1 trln so'mdan 2026-yil boshida 604,0 trln so'mga, 2026-yil 1-iyun holatiga esa 636,0 trln so'mga yetgan. Tadqiqotda kreditlash samaradorligini kreditlar hajmi o'sishi bilan bir qatorda aktivlar sifati, riskni hisobga olgan daromadlilik, portfel konsentratsiyasi, kreditlarni undirish va kredit ajratilgandan keyingi monitoring samaradorligi orqali baholash zarurligi asoslangan.

Kalit so'zlar: kredit operatsiyalari, tijorat banklari, kredit samaradorligi, kredit riski, kredit portfeli, kredit skoringi, muammoli kreditlar (NPL), riskka asoslangan narxlash, kredit monitoringi, bank sektori.

Аннотация: Эффективность кредитных операций является важным фактором финансовых результатов, качества активов и устойчивости коммерческих банков. В исследовании разработана комплексная методология повышения эффективности кредитных операций посредством оценки заёмщиков, риск-ориентированного ценообразования, цифрового кредитного скоринга, диверсификации портфеля, постоянного мониторинга и механизмов раннего предупреждения. Использованы сравнительный, статистический, аналитический и системный подходы на основе официальных данных банковского сектора Республики Узбекистан. Результаты показывают, что общий кредитный портфель Узбекистана увеличился с 533,1 трлн сумов на начало 2025 года до 604,0 трлн сумов на начало 2026 года и достиг 636,0 трлн сумов по состоянию на 1 июня 2026 года. Обосновано, что эффективность кредитования следует оценивать не только по росту кредитов, но и с учётом качества активов, доходности с поправкой на риск, концентрации портфеля, эффективности взыскания и посткредитного мониторинга.

Ключевые слова: кредитные операции, коммерческие банки, эффективность кредитования, кредитный риск, кредитный портфель, кредитный скоринг, проблемные кредиты (NPL), риск-ориентированное ценообразование, кредитный мониторинг, банковский сектор.

INTRODUCTION

Credit operations represent one of the core activities of commercial banks and constitute a major source of interest income. At the same time, lending creates credit risk because borrowers may fail to meet their contractual obligations. Therefore, increasing the efficiency of credit operations requires a balance between expanding lending activity and maintaining an acceptable level of risk.

The importance of this issue has increased as banking sectors continue to experience dynamic credit expansion.

According to the Central Bank of the Republic of Uzbekistan, the total loan portfolio of the banking sector increased from UZS 533.1 trillion on January 1, 2025 to UZS 604.0 trillion on January 1, 2026, representing approximately 13% annual growth. By June 1, 2026, the total loan portfolio had reached UZS 636.0 trillion, reflecting the continued expansion of lending activity.

Such expansion creates favorable opportunities for strengthening investment, household consumption, entrepreneurship, and overall economic activity. At the same time, the growing scale of lending highlights the importance of further developing effective credit assessment, portfolio management, and post-lending monitoring practices. These measures can support balanced credit growth, improve the allocation of financial resources, and contribute to the sustainable development of the banking sector.

The Basel Committee's revised 2025 Principles for the Management of Credit Risk emphasize four major areas: establishing an appropriate credit-risk environment, maintaining sound credit-granting processes, ensuring effective credit administration and monitoring, and maintaining adequate controls over credit risk.

Consequently, credit efficiency should not be interpreted simply as the volume or growth rate of loans. An efficient credit operation should simultaneously contribute to profitability, maintain appropriate risk levels, minimize problem loans, and use financial and human resources effectively.

The purpose of this research is to develop a practical methodology for increasing the efficiency of credit operations in commercial banks through improvements in borrower assessment, credit scoring, risk-based pricing, portfolio management, monitoring, and recovery mechanisms.

REVIEW OF LITERATURE ON THE SUBJECT

The efficiency of credit operations is closely related to credit risk management, borrower creditworthiness assessment, credit portfolio quality, and the ability of banks to generate risk-adjusted returns. The existing literature demonstrates that credit efficiency should not be evaluated solely by the growth of lending volumes. Instead, the quality of credit decisions, probability of default, non-performing loans, portfolio concentration, and post-lending monitoring should also be considered.

One of the fundamental contributions to quantitative credit-risk assessment was made by Edward I. Altman. His Z-score model, introduced in 1968, demonstrated how financial ratios could be combined to predict corporate bankruptcy. The model provided an important analytical foundation for assessing the financial condition of borrowers and identifying potential credit problems before they materialize. Altman's approach remains relevant to bank lending because it emphasizes the importance of profitability, liquidity, leverage, and other financial indicators in evaluating borrower risk.

Robert C. Merton developed another influential approach to credit-risk assessment by applying option-pricing theory to corporate debt. His structural model, published in 1974, established a relationship between the value of a firm's assets, its liabilities, and the probability of default. This approach contributed to the development of modern credit-risk models by demonstrating that default risk can be assessed through the economic value of the borrower's assets and its debt obligations rather than through historical financial indicators alone.

Credit scoring represents another important area of research in banking. Lyn C. Thomas, David B. Edelman, and Jonathan N. Crook systematically examined the theoretical and practical foundations of credit scoring. Their research demonstrated the importance of statistical scoring techniques in standardizing credit decisions and distinguishing borrowers according to their risk characteristics. Credit scoring can reduce the influence of subjective decisions and improve the consistency and efficiency of lending decisions, particularly in retail banking.

Bart Baesens and his co-authors compared a wide range of classification techniques used in credit scoring and demonstrated the potential of quantitative and computational methods for improving the prediction of credit risk. Their research showed that the application of advanced statistical and data-driven techniques can enhance borrower classification and support more consistent credit decisions. These findings are particularly relevant to the development of digital credit-scoring systems and automated lending processes.

The relationship between rapid credit expansion and credit risk has also received considerable attention in the academic literature. José Luis Jiménez and Jesús Saurina investigated the relationship between credit cycles, credit risk, and prudential regulation. Their research indicated that periods of rapid credit expansion can be associated with a subsequent deterioration in credit quality. This finding is important for banks experiencing strong portfolio growth because it suggests that increasing lending volumes should be accompanied by appropriate underwriting standards, risk controls, and monitoring mechanisms.

Overall, the reviewed literature indicates that credit-operation efficiency should be understood as a multidimensional concept. It includes not only the expansion of the loan portfolio but also borrower repayment capacity, probability of default, asset quality, risk-adjusted profitability, portfolio concentration, and the effectiveness of post-lending monitoring. The studies of Altman, Merton, Thomas and his co-authors, Baesens and his co-authors, Jiménez and Saurina, Berger and DeYoung, Louzis and his co-authors, and Lessmann and his co-authors provide

complementary theoretical and empirical foundations for developing an integrated credit-efficiency framework.

Research Methodology

The study applies a combination of **system analysis, comparative analysis, statistical analysis, financial analysis, and risk-based assessment**.

The research methodology is structured around five stages.

Stage 1. Assessment of the credit environment

The first stage examines the overall development of the banking sector, including loan-portfolio growth, deposits, capital, and the scale of credit intermediation.

Stage 2. Borrower assessment

The second stage evaluates the principal characteristics that should be considered before approving a loan:

- repayment capacity;
- cash-flow generation;
- profitability;
- liquidity;
- leverage;
- credit history;
- collateral;
- sectoral risk;
- borrower concentration;
- existing debt obligations.

Stage 3. Risk-based credit decision

The third stage involves assigning borrowers to different risk categories. Banks should differentiate credit conditions according to the estimated probability of default and expected loss.

Stage 4. Post-lending monitoring

The fourth stage focuses on monitoring the borrower's financial condition after credit disbursement. Early-warning indicators should be established to identify deterioration before a loan becomes non-performing.

Stage 5. Portfolio optimization

The final stage evaluates the loan portfolio as a whole. The bank should monitor sectoral, geographical, product, currency, maturity, and borrower concentration and adjust its credit strategy accordingly.

The empirical component of the study uses official data from the Central Bank of the Republic of Uzbekistan. The analysis covers the banking sector's loan portfolio, deposits, capital, and the structure of lending to individuals and legal entities.

ANALYSIS AND RESULTS

The Uzbek banking sector has experienced significant growth in credit activity (Table 1).

Table 1. Main indicators of Uzbekistan's banking sector¹

Indicator	June 1, 2025	June 1, 2026	Growth
Total assets, UZS trillion	829.8	984.4	19%
Total loan portfolio, UZS trillion	567.7	636.0	12%
Total deposits, UZS trillion	345.6	460.6	33%
Total capital, UZS trillion	121.5	145.5	20%

The table demonstrates that all four major banking-sector indicators increased during the period. The loan portfolio grew by 12%, while deposits increased by 33%. This indicates that the banking system's funding base expanded considerably faster than its aggregate loan portfolio.

From the perspective of credit efficiency, this development creates an opportunity for banks to improve the quality of credit intermediation. A larger deposit base can provide banks with additional resources for lending, but these resources should be allocated through sound credit-selection mechanisms.

The growth of assets by 19% and capital by 20% also indicates an expansion of the financial capacity of the banking system. However, growth itself cannot be considered sufficient evidence of improved credit efficiency. The quality of loans, risk-adjusted profitability and repayment performance must also be considered.

The total loan portfolio increased from UZS 533.1 trillion on January 1, 2025 to UZS 604.0 trillion on January 1, 2026 and further to UZS 636.0 trillion by June 1, 2026 (Figure 1).

¹ Source: Author's own work.

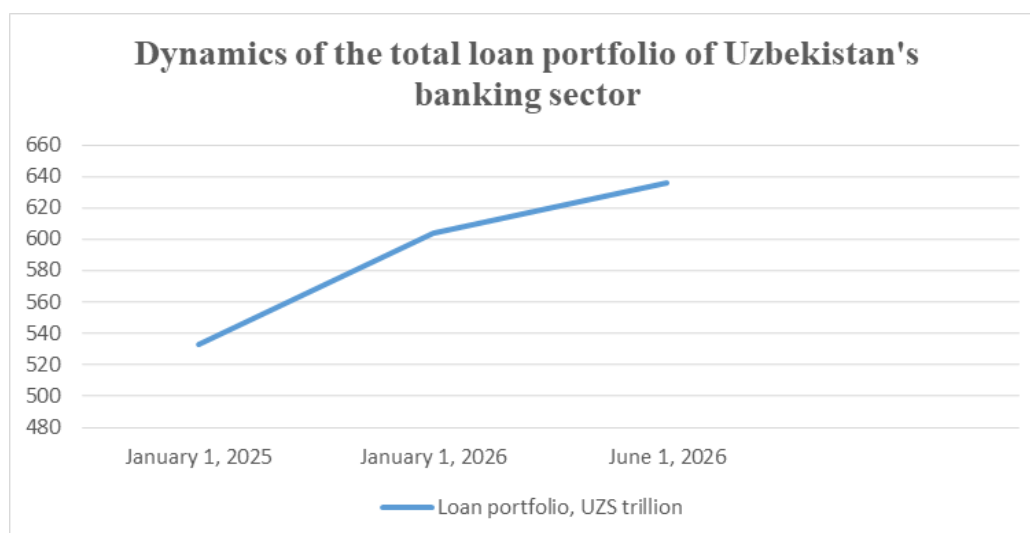


Figure 1. Dynamics of the total loan portfolio of Uzbekistan's banking sector²

The graph demonstrates a persistent upward trend in lending activity. Between January 1, 2025 and June 1, 2026, the loan portfolio increased by approximately UZS 102.9 trillion, equivalent to about 19.3%.

This expansion increases the importance of efficient credit-selection and monitoring systems. When a loan portfolio becomes larger, weaknesses in credit assessment can generate increasingly significant financial consequences.

Therefore, the methodology for increasing credit efficiency should focus on **quality-adjusted growth**, rather than maximizing the absolute volume of lending.

As of June 1, 2026, the banking sector's total loan portfolio amounted to UZS 635.978 trillion. Loans to individuals accounted for UZS 232.852 trillion, while loans to legal entities amounted to UZS 403.126 trillion (Figure 2).

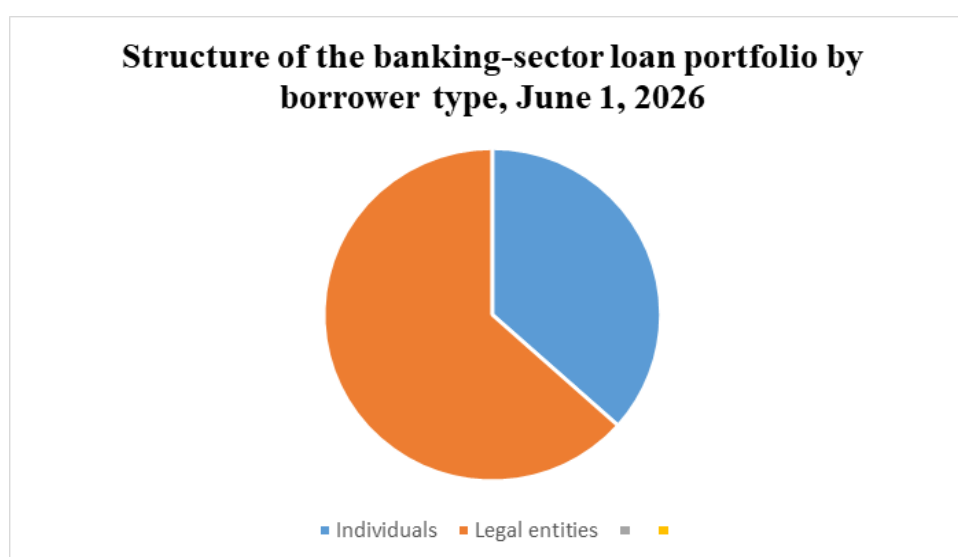


Figure 2. Structure of the banking-sector loan portfolio by borrower type, June 1, 2026³

The structure demonstrates that legal entities accounted for the larger share of the banking-sector loan portfolio, at 63.4%, while individuals accounted for 36.6%.

This structure has important implications for credit-risk management. Corporate lending often involves larger individual exposures, more complex financial structures, sectoral dependencies and longer maturities. Consequently, corporate credit operations require detailed cash-flow analysis, financial statement assessment, business-model evaluation and scenario analysis.

² Source: Author's own work.

³ Source: Author's own work.

Retail lending, in contrast, can benefit more strongly from automated scoring and standardized risk assessment because banks process a much larger number of relatively smaller exposures.

Thus, a unified credit methodology should be avoided. Banks should develop differentiated credit models for corporate and retail portfolios.

An effective credit decision should combine quantitative and qualitative information.

For corporate borrowers, the following indicators should receive particular attention:

- revenue stability;
- operating cash flow;
- profitability;
- current liquidity;
- leverage;
- debt-service capacity;
- accounts receivable and payable;
- collateral quality;
- sectoral prospects;
- existing liabilities.

For individuals, the assessment should emphasize:

- stable income;
- employment history;
- existing debt;
- repayment history;
- debt-service burden;
- transaction behavior;
- loan purpose.

The use of these variables enables banks to move from collateral-oriented lending toward repayment-capacity-oriented lending.

Collateral should remain an important risk-mitigation mechanism, but it should not substitute for an assessment of the borrower's ability to generate sufficient cash flow to service the loan.

Digitalization creates an opportunity to improve the speed and consistency of credit decisions.

An effective digital scoring model can combine information from:

- internal credit history;
- repayment behavior;
- income information;
- existing debt;
- account activity;
- customer relationship history;
- collateral information;
- sectoral or macroeconomic indicators.

The principal advantage of automated scoring is not merely speed. Its greater value lies in standardization and consistency.

However, automated models should be regularly validated. Changes in economic conditions can reduce the predictive performance of models developed from historical data. Banks should therefore conduct periodic model validation, back-testing and recalibration.

Credit efficiency also depends on whether the interest rate adequately compensates the bank for the risk assumed.

A borrower with a relatively low probability of default should not necessarily receive identical pricing to a borrower with materially higher risk.

Risk-based pricing can be structured around:

Borrower risk → Expected loss → Capital requirement → Funding cost → Operating cost → Required return → Loan price

This approach allows banks to connect pricing decisions with the actual economic cost of lending.

If loan pricing does not reflect risk differences, a bank may experience a situation where high-risk lending generates insufficient returns to compensate for potential losses.

Credit monitoring should continue throughout the entire life cycle of a loan.

Early-warning indicators may include:

- deterioration in repayment behavior;
- declining account turnover;

- reduction in business revenues;
- increased leverage;
- overdue tax or supplier obligations;
- deterioration in collateral value;
- significant changes in ownership or management;
- concentration of revenues in a small number of customers;
- repeated requests for restructuring.

The objective of early-warning systems is not simply to classify a loan after problems have already occurred. The principal objective is to provide sufficient time for the bank to take preventive action.

Therefore, credit operations should be organized according to a **loan life-cycle model: Application → Assessment → Approval → Disbursement → Monitoring → Early warning → Restructuring/recovery → Closure**

This approach can significantly improve the continuity of credit-risk management.

The loan portfolio should be monitored by:

- economic sector;
- borrower type;
- geographical region;
- currency;
- maturity;
- loan product;
- borrower group;
- collateral type.

The Central Bank's regional data show considerable differences in the distribution of lending. As of June 1, 2026, Tashkent city accounted for UZS 292.345 trillion of the UZS 635.978 trillion national loan portfolio, while other regions had substantially smaller portfolios.

This concentration demonstrates why portfolio-level monitoring is essential. A bank should not evaluate every credit independently while ignoring aggregate exposure to the same region, sector or borrower group.

Credit expansion must be accompanied by appropriate asset-quality controls.

For example, the Central Bank reported that total NPLs amounted to UZS 21.185 trillion, or 4.0% of the total loan portfolio, as of January 1, 2025.

This illustrates why loan growth should not be treated as the sole indicator of successful credit operations.

A more comprehensive evaluation system should include (Table 2):

Table 2. Key Criteria and Indicators for Assessing the Efficiency of Credit Operations⁴

Efficiency dimension	Example indicator
Growth	Loan portfolio growth
Asset quality	NPL ratio
Profitability	Net interest margin / ROA
Risk	Expected credit loss
Recovery	Recovery rate
Concentration	Sector/borrower concentration
Efficiency	Cost per loan processed
Service quality	Loan processing time

The most efficient credit operation is therefore not necessarily the fastest or largest loan. It is the loan that produces an appropriate risk-adjusted return while maintaining acceptable asset quality.

Based on the research findings, an integrated methodology for increasing credit efficiency can be formulated as seven consecutive stages:

Stage 1 — Customer identification and segmentation

Borrowers are classified according to their financial characteristics, loan purpose and risk profile.

Stage 2 — Comprehensive credit assessment

The bank evaluates repayment capacity, cash flow, leverage, collateral and credit history.

Stage 3 — Digital scoring and risk classification

Quantitative models assign a risk category and identify cases requiring additional analysis.

⁴ Source: Author's own work.

Stage 4 — Risk-based pricing

Interest rates and credit conditions reflect the estimated level of risk and cost.

Stage 5 — Controlled credit approval

Approval limits and authorization procedures are applied according to exposure size and risk.

Stage 6 — Continuous monitoring

The bank monitors repayment behavior, financial indicators and early-warning signals.

Stage 7 — Portfolio optimization

Management evaluates the aggregate portfolio and adjusts sectoral, regional and product exposures.

This methodology connects the individual credit decision with the strategic management of the entire loan portfolio.

CONCLUSIONS AND SUGGESTIONS

The research demonstrates that increasing the efficiency of credit operations requires a transition from a simple loan-growth model toward an integrated system based on risk-adjusted profitability, asset quality, digital assessment and continuous monitoring.

Official Central Bank data show that Uzbekistan's banking-sector loan portfolio increased from UZS 533.1 trillion on January 1, 2025 to UZS 604.0 trillion on January 1, 2026 and UZS 636.0 trillion by June 1, 2026. At the same time, loans to legal entities represented 63.4% of the total portfolio and loans to individuals 36.6% as of June 1, 2026.

The expansion of lending creates significant opportunities for economic development but also increases the importance of credit-risk management. Consequently, commercial banks should evaluate lending efficiency through multiple indicators rather than relying solely on portfolio growth.

Based on the findings, the following recommendations are proposed:

Strengthen borrower assessment by placing greater emphasis on repayment capacity and cash-flow analysis rather than collateral alone.

Develop differentiated scoring models for retail and corporate borrowers because their risk characteristics and information structures differ substantially.

Introduce risk-based pricing so that loan conditions reflect borrower risk, funding costs, expected losses and required returns.

Expand digital credit scoring while establishing regular model validation, back-testing and recalibration.

Develop early-warning systems capable of identifying deterioration in borrower financial conditions before loans become seriously overdue.

Strengthen post-lending monitoring through continuous analysis of repayment behavior, cash flows, collateral and borrower financial indicators.

Improve portfolio diversification by monitoring concentration across sectors, regions, borrower groups, currencies and products.

Integrate NPL management into the credit process so that problem-loan prevention begins during underwriting rather than only after default.

Establish risk-adjusted performance indicators for lending units and managers, linking loan growth with asset quality and profitability.

Apply the Basel credit-risk management principles by maintaining an appropriate credit-risk environment, sound credit-granting processes, effective credit administration and adequate risk controls.

Overall, the efficiency of credit operations should be understood as the ability of a commercial bank to generate sustainable income from lending while controlling credit risk and maintaining high asset quality. The proposed methodology — **segmentation → assessment → scoring → risk-based pricing → controlled approval → monitoring → portfolio optimization** — provides a systematic framework for achieving this objective.

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