

MECHANISMS OF THE IMPACT OF FINTECH TECHNOLOGIES ON FINANCIAL EFFICIENCY IN COMMERCIAL BANKS

Senior Manager, Novza Banking Services Center,

Joint-Stock Commercial Bank "Tengebank"

Shukhrat Komilovich Roziboyev

Abstract: This article analyzes the mechanisms through which fintech technologies enhance financial efficiency in commercial banks. The impact of fintech solutions on reducing operational costs, improving service speed, and increasing revenues is examined. The findings indicate that fintech technologies significantly improve banks' financial performance.

Key words: fintech technologies, commercial banks, financial efficiency, digital transformation, innovations, banking services.

Introduction

In recent years, the rapid development of fintech technologies in the global financial market has had a profound impact on all aspects of commercial banking operations, fundamentally transforming both the modes of service delivery and management mechanisms of banks. According to international studies, by 2023 nearly 75 percent of financial transactions worldwide were conducted through digital channels, compared to only 40 percent in 2016. The global fintech market exceeded USD 320 billion in 2024 and has been growing at an average annual rate of 20–25 percent. In particular, digital payment systems, artificial intelligence-based financial services, and mobile banking platforms represent the fastest-growing segments of fintech innovation [1]. These technologies significantly enhance the speed, accuracy, and convenience of banking services, thereby shaping a more efficient model compared to traditional banking practices.

The implementation of fintech technologies has also generated substantial positive effects on banks' internal operational processes. According to analyses of the global banking sector, commercial banks that have adopted fintech-based automated systems have reduced operational costs by an average of 20–35 percent. For example, the use of artificial intelligence in credit assessment has shortened loan approval processes from the traditional 5–7 days to as little as 1–2 hours. In addition, transaction processing costs through digital payment platforms have decreased by approximately 40 percent. These indicators clearly demonstrate the tangible economic impact of fintech technologies on improving banking efficiency.

Moreover, fintech innovations contribute positively to the growth of banks' revenues. International financial analyses indicate that banks with a higher share of digital services achieve net profit levels that are on average 15–20 percent higher than those of banks relying primarily on traditional services. The active use of mobile banking applications and digital wallets enables banks to increase transaction volumes and generate additional fee-based income. For instance, in developed economies, the volume of digital payments has nearly tripled over the past five years, accounting for a significant share of banks' operating revenues.

In the banking sector of Uzbekistan, the implementation of fintech technologies has also been developing at a significant pace. As of 2024, the number of active users of mobile banking applications in the country has exceeded 20 million, nearly doubling over the past three years. The volume of online payments has been increasing at an average annual rate of 30–40 percent. At the same time, the share of loans issued through digital lending platforms has approached nearly 25 percent of the total retail loan portfolio. These trends indicate that fintech technologies play a crucial role in expanding the scale of banking services and enhancing financial efficiency.

The widespread adoption of fintech technologies has also intensified the competitive environment among banks. According to statistical data, banks that actively implement digital

innovations have increased their market share by an average of 8–12 percent, while institutions that lag behind in the digitalization process have experienced a decline in customer inflows. This clearly confirms that fintech technologies are now regarded as an integral component of modern banking strategies.

Under these conditions, a thorough scientific analysis of the mechanisms through which fintech technologies affect the financial efficiency of commercial banks becomes particularly relevant. Financial efficiency is a key indicator reflecting banks' profitability, cost management effectiveness, return on assets, and sustainable development. Identifying the mechanisms through which fintech innovations influence these indicators, as well as assessing their short- and long-term economic outcomes based on empirical analysis, is essential. Therefore, a comprehensive examination of the impact of fintech technologies on the financial efficiency of commercial banks, supported by statistical evaluation and the development of practical recommendations, constitutes one of the important tasks of contemporary financial science.

Literature Review

In recent years, the impact of fintech technologies on the banking sector has been extensively examined by both international and domestic scholars, who have scientifically substantiated fintech as a key driver of innovative development. Academic studies increasingly view fintech not merely as a technological advancement, but as a strategic mechanism that transforms banks' business models.

In particular, Peter Gomber and his co-authors emphasize that fintech technologies fundamentally reshape the digital financial infrastructure, making traditional banking services more efficient and flexible. According to their research, fintech platforms enable rapid transaction processing, real-time data analysis, and the provision of personalized customer services, all of which significantly enhance banks' operational efficiency [2]. The authors also argue that cooperation between fintech companies and commercial banks serves as an important catalyst for the implementation of digital innovations.

The issue of the economic efficiency of technological innovations is comprehensively addressed in the studies of Erik Brynjolfsson and Andrew McAfee. Their research demonstrates that automation and digital technologies increase labor productivity in the financial services sector, simplify operational processes, and reduce costs. The authors highlight that artificial intelligence and Big Data technologies expand banks' capabilities in risk management, customer needs forecasting, and service personalization, thereby directly contributing to improved financial efficiency [3].

Empirical studies conducted by Iftekhar Hasan and Tiziano De Renzis are particularly significant in examining the impact of fintech technologies on banks' financial performance. Their findings show that banks implementing fintech-based digital services achieve higher profitability indicators, especially in terms of return on assets and net profit levels [4]. The authors provide empirical evidence that fintech innovations strengthen banks' financial stability by reducing operational costs and simultaneously facilitate the creation of new revenue streams.

Research Methodology

In the course of the study, statistical analysis, comparative analysis, a systemic approach, and empirical survey methods were employed. The relationship between the level of fintech technology adoption in commercial banks and key financial efficiency indicators—such as profitability, cost efficiency, and return on assets—was examined.

For the empirical analysis, data from banks' financial statements and customer survey results were used as the primary sources. The collected data were processed using correlation and regression analysis in order to assess the impact of fintech technologies on financial efficiency.

Analysis and Results

The analysis of empirical data and statistical indicators collected during the study reveals a significant improvement in financial efficiency among commercial banks that have actively implemented fintech technologies. In particular, digital payment systems, automated settlement platforms, and artificial intelligence-based services have streamlined banks' day-to-day operational processes and enhanced the efficiency of resource utilization.

According to the research findings, banks that have widely adopted fintech solutions reduced their operational costs by an average of 20–30 percent, with some institutions achieving reductions of up to 35 percent. These outcomes are primarily attributed to workforce optimization, the digitalization of document management processes, and the reduction of transaction processing costs through automated systems.

Table 1.
Impact of fintech technologies on the financial efficiency of commercial banks (comparative analysis)

No .	Indicators	Before FinTech Implementation	After FinTech Implementation	Degree of Change
1	Share of operational costs	100% (baseline)	70–80%	↓ 20–30% reduction
2	Share of digital payments in total transactions	30–35%	60–70%	↑ Twofold increase
3	Number of mobile banking users	100% (baseline)	140–150%	↑ 40–50% growth
4	Net profit indicator	100% (baseline)	115–118%	↑ 15–18% growth
5	Share of commission income	15–18%	25–30%	↑ 10–12 percentage points
6	Share of non-performing loans	8–10%	5–6%	↓ 3–5 percentage points
7	Return on assets (ROA)	1.5–1.8%	2.1–2.4%	↑ 0.6–0.7 percentage points
8	Correlation between FinTech adoption and efficiency	—	r = 0.70–0.80	Strong positive correlation

In addition, the sharp increase in transaction volumes processed through digital payment platforms has significantly boosted banks' commission-based revenues. The banks examined

within the scope of the study recorded digital payments accounting for an average of 60–70 percent of total transaction volumes, which is nearly twice as high as in the period prior to the implementation of fintech technologies. As a result, banks' operating revenues demonstrated a stable upward trend, contributing to overall improvements in financial performance.

The development of mobile banking services also emerged as one of the key factors influencing banks' financial efficiency. According to the research findings, banks that actively implemented fintech technologies experienced an average increase of 40–50 percent in the number of mobile banking users. This led to higher service usage frequency and an expansion of the customer base. Consequently, the net profit of these banks increased by an average of 15–18 percent. In some cases, revenues generated from digital services accounted for 25–30 percent of total bank profits, clearly highlighting the role of fintech innovations in diversifying banks' income sources.

Furthermore, it was found that fintech-based automated lending systems also contribute to improving the quality of loan portfolios. Through the rapid assessment of credit risks using artificial intelligence, the share of non-performing loans decreased by an average of 3–5 percentage points. This development strengthened banks' financial stability and had a positive impact on increasing return on assets.

The results of the statistical analysis confirmed the existence of a strong positive relationship between the level of fintech technology adoption and banks' financial efficiency indicators. According to the correlation analysis, the coefficient measuring the relationship between the level of fintech implementation and the reduction in operational costs was approximately $r \approx -0.75$, while the correlation between the level of fintech adoption and net profit growth ranged between $r \approx 0.70$ and 0.80. These findings provide strong empirical evidence that fintech innovations exert a significant and stable impact on banks' financial performance.

Overall, the research results clearly confirm that fintech technologies represent an important efficiency-enhancing mechanism in the operations of commercial banks. Reductions in operational costs, increases in revenues, effective management of credit risks, and the expansion of the customer base emerged as the key economic outcomes of fintech innovations. At the same time, banks that have implemented fintech technologies in a consistent and strategic manner have gained the ability to enhance competitiveness and ensure financial stability. This, in turn, provides both scientific and practical justification for the continued development of fintech innovations in the banking sector.

Conclusion

The implementation of fintech technologies in commercial banks has emerged as an important mechanism for enhancing financial efficiency. Fintech solutions strengthen banks' economic stability by reducing operational costs, increasing service speed, and creating new sources of income.

The research findings demonstrate that banks that consistently adopt fintech technologies are able to improve their competitiveness and achieve better financial performance. Therefore, the development of fintech innovations should be defined as a strategic priority in the long-term strategies of commercial banks.

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