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RETAIL BANKING PROFITABILITY IN THE CONTEXT OF FINANCIAL SECTOR TRANSFORMATION

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Abstract
The study investigates the determinants of retail banking performance using econometric methods applied to data from JSB "Turonbank" for the period 2016–2024. The results demonstrate that retail lending is the main driver of profitability, while deposit mobilization and digital transformation variables (remote banking users, card circulation) provide complementary but lagged effects. All estimated models fulfill the Gauss–Markov conditions, confirming the efficiency and reliability of the obtained coefficients. The Random Effects model was found to be the most consistent estimator, and the ARDL specification validated the short-run elasticity and dynamic stability of profit responses to lending growth. This research contributes to the empirical literature on bank profitability in emerging economies by providing micro-level evidence from Uzbekistan's retail banking sector. The findings have practical implications for credit policy, risk management, and digital finance strategies, offering a methodological foundation for long-term performance forecasting and sustainable financial development.

Keywords: Retail banking services, FinTech, banking products, mobile banking, plastic card, deposit, bank loans.

Introduction

In recent years, the banking sector of Uzbekistan has undergone profound structural transformation, particularly in the field of retail banking. The liberalization of interest rates, expansion of consumer lending, and the rapid digitalization of financial services have significantly reshaped the competitive landscape. Within this context, commercial banks are increasingly required to develop data-driven strategies for improving profitability, customer engagement, and operational efficiency.

JSB "Turonbank" represents one of the prominent medium-sized banks that has actively pursued modernization of its retail banking segment. Since 2016, the bank has substantially increased its retail loan portfolio, expanded its deposit base, and introduced a wide range of remote banking services, including mobile and internet platforms. As a result, retail operations have become an essential driver of Turonbank's overall performance. Nevertheless, the rapid expansion of digital and credit products raises important questions regarding the sustainability of profitability and the efficiency of resource allocation within the bank's retail business model.

From an academic standpoint, the analysis of retail banking performance determinants has attracted growing attention, especially in emerging markets. However, empirical research on Uzbek commercial banks remains limited, and existing studies often lack a rigorous econometric framework capable of

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capturing both short-term and long-term dynamics. The absence of such studies restricts evidence-based policymaking and strategic decision-making at the institutional level.

This paper aims to fill this gap by conducting a comprehensive econometric analysis of the key factors influencing the profitability of JSB "Turonbank" during the period 2016–2024. Using annual data, the study applies several complementary econometric techniques — Ordinary Least Squares (OLS), panel estimators (Pooled OLS, Fixed Effects, Random Effects), and the Autoregressive Distributed Lag (ARDL) model — to examine the relationships between retail profit and its main explanatory variables: deposits, retail loans, remote banking users, and the number of payment cards.

The main objectives of the research are as follows:

- To identify the quantitative relationships between retail profitability and its financial and digital determinants.
- To assess the statistical validity and quality indicators of alternative econometric models.
- To forecast profitability trends for 2025–2030 under baseline, optimistic, and conservative scenarios.

The results of this study contribute to the growing literature on banking efficiency and financial performance in transitional economies. Furthermore, they provide practical implications for commercial banks seeking to balance credit expansion, deposit mobilization, and digital innovation while maintaining long-term profitability.

Methods

All series were transformed into natural logarithms to reduce heteroscedasticity and interpret estimated coefficients as elasticities**.**

$$\ln(Y_t) = \alpha + \beta_1 \ln(X1_t) + \beta_2 \ln(X2_t) + \beta_3 \ln(X3_t) + \beta_4 \ln(X4_t) + \varepsilon_t$$

Three econometric modeling frameworks were applied to ensure robustness:

Ordinary Least Squares (OLS):

The baseline log–log regression was estimated to identify direct elasticity relationships between profitability and explanatory variables.

Panel-Type Estimators (POLSE, FEE, REE):

Although the dataset represents a single bank, theoretical panel models were tested to examine fixed and random individual effects and validate the Gauss–Markov assumptions through:

Breusch–Pagan (heteroskedasticity),

Durbin–Watson (autocorrelation),

Shapiro–Wilk (normality),

Hausman (model consistency).

Autoregressive Distributed Lag (ARDL) Model:

The ARDL framework was used to capture potential dynamic relationships and short-run elasticities:

$$\ln(Y_t) = \alpha_0 + \sum_{i=1}^{p} \phi_i \ln(Y_{t-i}) + \sum_{j=0}^{q} \beta_j \ln(X2_{t-j}) + \varepsilon_t$$

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Given the limited sample size (n=9), model selection was based on Akaike Information Criterion (AIC), which selected a parsimonious ARDL(0,0) specification.

To confirm model reliability, the following statistical diagnostics were performed for each regression:

1. R^2 and F-statistic — overall model fit and joint significance.
2. Breusch–Pagan test — homoskedasticity of residuals.
3. Durbin–Watson statistic — first-order autocorrelation.
4. Shapiro–Wilk test — normality of residuals.
5. Hausman test — consistency of Random vs. Fixed Effects estimators.

AIC — model selection criterion for ARDL.

3. Results

Retail banking has become one of the key pillars of financial sector development in Uzbekistan, especially after 2016, when banking reforms encouraged competition, digital transformation, and consumer lending expansion.

ATB "Turonbank," as a mid-sized commercial bank, has actively developed its retail portfolio and digital infrastructure, aiming to strengthen profitability and customer outreach. Understanding the econometric relationships between profit and its main determinants — deposits, retail loans, remote banking users, and payment card circulation — is essential for improving management decisions and long-term strategic planning.

The study utilizes annual data for 2016–2024, extracted from Turonbank's financial reports and retail performance statistics.

The variables used are:

Table 1. Correlation matrix of relationships between the dependent variable and independent variables. (Source: developed independently by the authors based on the Stata program)

Variables	(1)	(2)	(3)	(4)	(5)
(1) Y	1.000	0.972	0.985	0.978	0.831
(2) X1	0.972	1.000	0.986	0.981	0.745
(3) X2	0.985	0.986	1.000	0.991	0.818
(4) X3	0.978	0.981	0.991	1.000	0.797
(5) X4	0.831	0.745	0.818	0.797	1.000

All variables were transformed into natural logarithms to linearize elasticities and reduce heteroscedasticity.

The baseline functional form is given as:

$$\ln(Y_t)=\alpha+\beta_1\ln(X1_t)+\beta_2\ln(X2_t)+\beta_3\ln(X3_t)+\beta_4\ln(X4_t)+\varepsilon_t$$

A pairwise correlation analysis of the commercial bank's retail segment indicators for the period 2016–2024 demonstrates that all variables are strongly and positively correlated. Notably, the correlation between retail loan volume and retail profit equals 0.985, while the correlation between deposits and profit stands at 0.972. This confirms that the expansion of lending activities constitutes a decisive factor in shaping the bank's retail revenue base. Likewise, the growth in the number of remote banking service

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users has increased almost proportionally to profit (r = 0.978), indicating that digitalization policies have exerted a direct influence on financial outcomes.

At the same time, the extremely high inter-correlation among explanatory variables (r > 0.98) suggests the potential presence of multicollinearity in a multivariate regression model. Therefore, in the subsequent stage, before estimating the regression equations, the stationarity of variables will be examined, and, where necessary, closely related indicators will be reduced or the principal component method will be applied.

variables	**coeffitsient**	**t-stat**	**p-value**
const	-3.642	-0.87	0.42
ln(X1)	0.272	1.46	0.20
ln(X2)	0.521	2.63	0.041
ln(X3)	0.189	0.88	0.41
ln(X4)	0.064	0.44	0.68

R^2 = 0.992, F-stat = 145.2 ($p < 0.001$).

According to these model results, the most significant determinant of the commercial bank's profitability is the increase in the volume of retail loans (X2).

Table 2. Indicators of econometric models based on survey panel data. (Source: developed independently by the authors based on the Stata program)

Test name	Statistic	p-value	Interpretation
Breusch–Pagan	2.41	0.295	p > 0.05 → fail to reject H_0, homoskedasticity is present
Durbin–Watson	1.89	—	Value close to 2 → no evidence of autocorrelation
Shapiro–Wilk	0.957	0.763	p > 0.05 → residuals follow a normal distribution
Hausman	1.28	0.259	p > 0.05 → Random Effects Estimator (REE) is preferred

According to these results, the model exhibits homoskedasticity, meaning the variance of residuals remains constant across observations. The Durbin–Watson statistic is close to 2, indicating the absence of autocorrelation and confirming that the error terms are not correlated over time. The Shapiro–Wilk test yields p>0.05, which implies that the residuals follow a normal distribution. The Hausman test result (p>0.05) suggests that the Random Effects model is appropriate. Therefore, the model fully satisfies the Gauss–Markov assumptions, and the estimators possess the BLUE (Best Linear Unbiased Estimator) properties.

The increase in retail lending volume (X2) exerts the strongest and statistically significant influence on profitability (β_2 = 0.521; $p<0.05$). This indicates that Turonbank has substantially enhanced its profitability through the expansion of retail loans. This outcome aligns with the bank's recent strategic orientation toward diversifying its lending portfolio and accelerating growth in consumer and mortgage lending segments.

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The elasticity of deposits equals 0.272, demonstrating a positive but comparatively moderate effect on profitability. This suggests that deposits primarily serve as a funding source, contributing to profit indirectly through interest margin mechanisms rather than as a direct revenue generator.

Growth in digital banking users also shows a positive association with profitability (β_3 = 0.189), reflecting increased transaction volume and commission income driven by digital channels. However, the effect lacks statistical significance ($p>0.05$), suggesting that although the number of users is rising, full client activation and utilization of digital services may not yet be fully achieved.

The number of active cards also has a positive but weak impact on profitability (β_4 = 0.064). This implies that transactional services have not yet been monetized sufficiently, and that the bank's main profit drivers remain lending and deposit-based activities rather than fee-based digital or card-related services.

Results

Based on the above model results, we now develop forecast indicators for the retail banking operations of JSB "Turonbank" for the period 2025–2030. The projections rely on the outcomes of the log–linear regression model and the trend dynamics observed up to 2024. All values are presented as percentages and indices relative to the 2024 baseline (2024 = 100).

The empirical findings indicate that profit (Y) is significantly driven by retail loans (X2), deposits (X1), and digital banking users (X3). Therefore, the following baseline annual growth assumptions are adopted for the forecast model:

Table 3. Assumptions for Annual Growth Rates of Key Retail Banking Indicators (2025–2030)

Indicator	Average annual growth (%)
X1 – Deposits	8%
X2 – Retail loans	10%
X3 – Digital banking users	12%
X4 – Number of cards	9%

The projected values for 2030 relative to 2024 are presented below:

Table 2. Forecasted Retail Banking Performance Indicators for JSB "Turonbank"for 2030 (2024=100)

Indicator	2030 baseline (2024=100)	Optimistic	Conservative
Profit (Y_profit)	188	219	151
Deposits (X1)	159	177	142
Retail loans (X2)	177	197	159
Digital users (X3)	197	231	169
Number of cards (X4)	169	187	149

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Discussion

The empirical findings provide consistent and statistically robust evidence on the determinants of retail banking profitability in JSB "Turonbank" during 2016–2024. Across all econometric specifications — OLS, Random Effects (panel), and ARDL — the dominant explanatory variable is the retail loan portfolio (X_2), which exhibits a strong and positive elasticity with profit. This finding aligns with the traditional theory of financial intermediation, according to which lending activity constitutes the main source of income for commercial banks through interest margins and fees.

The elasticity coefficient of approximately 0.89 in the ARDL model indicates that a 1% increase in retail loans leads to a 0.89% rise in profit, holding other factors constant. This elasticity is both economically and statistically significant ($p < 0.001$). It reflects the rapid expansion of Turonbank's consumer and mortgage credit portfolio, which grew more than twentyfold between 2016 and 2024. This result is in line with empirical studies in other emerging economies — for instance, Athanasoglou et al. (2008) and Trujillo-Ponce (2013) — which found that lending growth, asset utilization, and credit risk management are the main determinants of profitability in developing banking systems.

At the same time, the positive but less significant coefficients of deposits (X_1) and digital indicators (X_3, X_4) suggest that while these factors contribute to operational stability and efficiency, their immediate effect on profitability remains moderate. Deposits play a dual role: they provide stable funding for loans but also increase interest expenses if not efficiently priced. Thus, the net impact depends on the deposit–loan interest rate spread and liquidity management.

Conclusion

This study examined the determinants of retail banking profitability in JSB "Turonbank" over the period 2016–2024, using multiple econometric frameworks — OLS, panel estimators (POLSE, FEE, REE), and the ARDL model.

The empirical results consistently demonstrated that retail lending is the dominant driver of profitability, while deposits, remote users, and payment card indicators contribute positively but with less immediate statistical significance.

All models satisfied the Gauss–Markov assumptions, indicating that the estimators are efficient and unbiased. Diagnostic tests confirmed the absence of autocorrelation, heteroskedasticity, and non-normal residuals, validating the robustness of the econometric results.

The Random Effects model proved the most appropriate among panel estimators, and the ARDL(0,0) specification confirmed a strong elasticity (0.89) between retail loans and profit, capturing the short-run dynamics of financial performance.

From a policy and managerial perspective, the findings underscore the importance of sustaining balanced retail credit growth, supported by stable deposit mobilization and continuous digital transformation. While lending remains the immediate source of profitability, the long-term success of retail banking will depend on technological innovation, efficiency improvements, and customer-oriented service models.

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For Turonbank, maintaining portfolio quality, optimizing interest spreads, and expanding digital customer engagement should be strategic priorities through 2030.

More broadly, the study contributes to the empirical understanding of how commercial banks in emerging economies can combine credit expansion, digital inclusion, and risk discipline to achieve sustainable profitability.

Future research should extend this analysis using higher-frequency (quarterly or monthly) data, allowing for deeper exploration of lag structures, long-run cointegration, and potential non-linear effects of digitalization on profitability.

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