ECONOMETRIC ASSESSMENT OF THE IMPACT OF CUSTOMER BASE EXPANSION ON REVENUE GROWTH IN COMMERCIAL BANKS

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Abstract

The thesis assessed econometrically how the expansion of the customer base relates to revenue growth in Uzbekistan's commercial banks. Monthly Central Bank statistics for 2022–2025 were aggregated into 16 quarters, and log-log models of total, interest and non-interest income on the number of remote banking users were estimated with inflation, the policy rate and seasonal controls and Newey–West standard errors. A 1% larger customer base was associated with 0.70% higher total revenue, 0.58% higher interest income and 0.94% higher non-interest income. Customer growth was linked to deposits (elasticity 0.83) and loans (0.45). Annual revenue per user fell from UZS 3.81 million to UZS 2.95 million, which pointed to unused potential for monetisation. Activity-based customer metrics and cross-selling measures were proposed.

Keywords: commercial banks, customer base, bank revenue, elasticity, remote banking, cross-selling, Uzbekistan.

Annotatsiya

Tezisda O‘zbekiston tijorat banklarida mijozlar bazasini kengaytirish bilan daromadlar o‘sishi o‘rtasidagi bog‘liqlik ekonometrik baholandi. Markaziy bankning 2022–2025-yillar bo‘yicha oylik statistikasi 16 ta choraklik kuzatuvga jamlandi. Jami, foizli va foizsiz daromadlarning masofaviy bank xizmatlari foydalanuvchilari soniga bog‘liqligi log-log modellarida inflyatsiya, asosiy stavka va mavsumiylik hisobga olingan holda Newey–West standart xatolari bilan baholandi. Mijozlar bazasi 1 foizga kengayganda jami daromad 0,70 foizga, foizli daromad 0,58 foizga, foizsiz daromad 0,94 foizga yuqori bo‘lgani aniqlandi. Mijozlar soni o‘sishi depozitlar (elastiklik 0,83) va kreditlar (0,45) o‘sishi bilan bog‘liq ekani ko‘rsatildi. Bir foydalanuvchiga to‘g‘ri keladigan yillik daromad 3,81 mln so‘mdan 2,95 mln so‘mga kamaydi. Natijalar asosida faol mijozlarga asoslangan ko‘rsatkichlar va kross-sotuvni kuchaytirish bo‘yicha takliflar berildi.

Kalit so‘zlar: tijorat banklari, mijozlar bazasi, bank daromadi, elastiklik, masofaviy bank xizmatlari, kross-sotuv, O‘zbekiston.

Аннотация

В тезисе была эконометрически оценена связь между расширением клиентской базы и ростом доходов коммерческих банков Узбекистана. Месячная статистика Центрального банка за 2022–2025 гг. была агрегирована в 16 квартальных наблюдений. Зависимость совокупного, процентного и непроцентного дохода от числа пользователей дистанционного банковского обслуживания была оценена в log-log моделях с учётом инфляции, ключевой ставки и сезонности, со стандартными ошибками Ньюи–Уэста. Рост клиентской базы на 1% сопровождался ростом совокупного дохода на 0,70%, процентного дохода на 0,58% и непроцентного дохода на 0,94%. Рост числа клиентов был связан с ростом депозитов (эластичность 0,83) и кредитов (0,45). Годовой доход на одного пользователя снизился с 3,81 до

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2,95 млн сумов. На основе результатов были предложены показатели активности клиентов и меры по развитию кросс-продаж.

Ключевые слова: коммерческие банки, клиентская база, доход банка, эластичность, дистанционное банковское обслуживание, кросс-продажи, Узбекистан.

INTRODUCTION

Over the past four years Uzbekistan's banks have moved a large part of their customer relationships onto mobile and internet channels. The number of remote banking users rose from 20.2 million at the start of 2022 to 82.9 million at the start of 2026, and the number of bank cards from 27.1 million to 68.3 million. Over the same period gross banking revenue, the sum of interest and non-interest income, grew from UZS 94.9 trillion in 2022 to UZS 200.8 trillion in 2025 [1] [2] [3]. The reforms that opened the sector to competition and digital entry made this expansion possible, and they raise a question that matters for every bank's strategy: how much revenue does an additional customer actually bring?

Customer numbers are often reported as a success indicator in their own right, yet a bank earns money only when customers keep balances, borrow, pay and buy further products. If revenue rises in proportion to the customer base, acquisition spending pays for itself; if it rises less than proportionally, the bank has to work on monetising the customers it already has. This thesis estimates that relationship for Uzbekistan's banking system and asks three questions. RQ1: what is the elasticity of bank revenue with respect to the customer base? RQ2: does non-interest income respond more strongly than interest income? RQ3: through which balance-sheet channels does the customer base reach revenue? The contribution is a reproducible elasticity estimate on official data and a channel framework that a bank can apply to its own customer records.

LITERATURE REVIEW

Marketing research treats customers as assets whose value can be measured. Gupta et al. showed that the value of a customer base can be derived from acquisition, retention and margin data, and that a one percent gain in retention raises firm value far more than an equal improvement in margin or acquisition cost [4]. In banking, Li et al. found that consumers acquire financial products in a fairly predictable order, so a larger base creates a pipeline for selling deposits, cards, loans and investment products to the same people [5].

A second stream links digital channels to bank performance. DeYoung et al. reported that internet banking raised the profitability of US community banks, mainly through deposit service charges [6], and Hernando and Nieto found that the online channel reduced overhead costs and improved the returns of Spanish banks after a lag of one and a half to three years [7]. Fee income itself has a mixed record: DeYoung and Rice associated non-interest income with higher returns [8], while Stiroh showed that it is more volatile than lending income [9].

Network effects explain why customer growth can reinforce itself. The value of a payment network to each participant rises with the number of other participants [10], and card and payment platforms set prices so as to attract both sides of the market [11]. Deposits add a funding channel: banks with a strong retail franchise pay depositors less than market rates and obtain cheap, stable funding [12]. These mechanisms are rarely brought together in one elasticity framework for a fast-digitising emerging market, and Uzbek evidence on the revenue side of digital customer growth is still limited. Three hypotheses follow. H1: revenue grows with the customer base, with an elasticity below one. H2: non-interest income is more elastic than interest income. H3: customer growth reaches revenue through deposit funding and lending volume.

METHODOLOGY

The data are monthly series from the Statistical Bulletins of the Central Bank of the Republic of Uzbekistan for January 2022 to December 2025 [1] [2] [3]: cumulative interest and non-interest income of the banking system, the number of remote banking users and bank cards, total deposits and loans,

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annual CPI inflation and the policy rate. Monthly income was obtained by differencing the cumulative figures and summed into 16 quarters; stock variables were averaged within each quarter; where a later bulletin revised a figure, the latest vintage was used. The customer base is measured by remote banking users, because the card series has a level break in January 2025 (53.5 million in the 2024 issue against 62.0 million in the 2025 issue). The baseline model is:

$$\ln R_t=\alpha+\beta\ln U_t+\gamma_1\pi_t+\gamma_2 i_t+\sum_{s=2}^{4}\delta_s Q_{st}+\varepsilon_t \quad (1)$$

where R_t is quarterly revenue (total, interest or non-interest income, UZS billion), U_t is the average number of remote banking users (million), π_t is annual CPI inflation (%), i_t is the policy rate (%), Q_{st} are quarter dummies and ε_t is the error term. The coefficient β is the elasticity. In plain words, it shows by how many percent revenue changes when the customer base grows by one percent, after prices, interest rates and the season are taken into account.

Because revenue and customers both trend upwards, the levels relation may partly reflect a common trend. A growth version removes it:

$$\Delta_4\ln R_t=\alpha+\beta\Delta_4\ln U_t+\gamma_1\pi_t+\gamma_2\Delta_4 i_t+u_t \quad (2)$$

where Δ_4 denotes the change over four quarters and u_t is the error term. Put simply, this form asks whether quarters with faster customer growth were also quarters with faster revenue growth.

The channels in H3 are tested by replacing revenue with balance-sheet volumes:

$$\ln Z_t=\alpha_Z+\theta_Z\ln U_t+\gamma_{1Z}\pi_t+\gamma_{2Z} i_t+\sum_{s=2}^{4}\delta_{sZ}Q_{st}+e_t \quad (3)$$

where Z_t is total deposits or total loans (UZS billion), θ_Z is the elasticity of that volume with respect to customers and e_t is the error term. In other words, the equation checks whether more customers come with more funding and more lending.

Revenue per user connects the elasticity with monetisation:

$$RPU_t=\frac{R_t}{U_t},\quad \frac{\Delta\ln RPU_t}{\Delta\ln U_t}=\beta-1 \quad (4)$$

where RPU_t is annual revenue per remote banking user. If β is below one, each percent of customer growth lowers revenue per user by about $(1-\beta)$ percent; simply put, new customers are on average less active than existing ones. Estimation used ordinary least squares with Newey–West standard errors (three lags) [13], the Engle–Granger cointegration test [14] and, as a robustness check, model (1) on 48 monthly observations with month dummies. All calculations were made by the author in Python.

ANALYSIS AND RESULTS

Customer base and revenue, 2022–2025

Table 1

Customer base, balance sheet and revenue of Uzbekistan's banking system[1]

Indicator	2022	2023	2024	2025
Remote banking users, million	30.0	43.6	52.9	82.9
incl. individuals, million	28.8	42.2	51.5	81.2
Bank cards, million	34.2	46.2	62.0*	68.3
Deposits, UZS trillion	216.7	241.7	308.7	417.3
Loans, UZS trillion	390.0	471.4	533.1	604.0
Interest income, UZS trillion	61.7	86.7	111.9	127.7
Non-interest income, UZS trillion	33.2	42.1	55.1	73.1
Revenue, UZS trillion	94.9	128.7	167.0	200.8
Revenue growth, %	–	35.6	29.7	20.3
Revenue per user, UZS million	3.81	3.44	3.64	2.95

[1] Source: Central Bank of the Republic of Uzbekistan, Statistical Bulletins [1]; [2]; [3]; author's calculation. Stocks at year end (1 January of the following year), latest vintage. Revenue = interest income + non-interest income. Revenue per user = annual revenue / average number of remote banking users. *Revised figure; the 2024 issue reported 53.5 million.

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Table 1 shows that the customer base grew much faster than revenue. Remote banking users increased 4.1 times between January 2022 and January 2026, while annual revenue rose 2.1 times between 2022 and 2025. Non-interest income accelerated in 2025 (+32.6%) as interest income growth slowed to 14.2%. Revenue per user fell from UZS 3.81 million to UZS 2.95 million. In simple terms, each new digital user brought in less than the average existing user, a typical pattern when a market adds first-time and multi-bank customers.

Elasticity estimates

Table 2

Elasticity of revenue and balance-sheet volumes with respect to the customer base[2]

Variable	(1) ln Revenue	(2) ln Interest income	(3) ln Non-interest income	(4) ln Deposits	(5) ln Loans
ln Users	0.700*** (0.066)	0.578*** (0.066)	0.937*** (0.088)	0.833*** (0.041)	0.446*** (0.024)
Inflation, %	−0.015 (0.013)	−0.020** (0.010)	−0.007 (0.023)	0.038*** (0.005)	−0.002 (0.005)
Policy rate, %	−0.011 (0.047)	−0.072* (0.044)	0.108* (0.057)	0.042** (0.017)	−0.026 (0.019)
Observations	16	16	16	16	16
R^2 / adj. R^2	0.948 / 0.913	0.954 / 0.923	0.913 / 0.856	0.985 / 0.976	0.982 / 0.970

Columns (1)–(3) support H1 and H2. A 1% larger remote banking base was associated with 0.70% higher total revenue, 0.58% higher interest income and 0.94% higher non-interest income, all significant at the 1% level. The monthly model with month dummies gave a close total-revenue elasticity of 0.74 (SE 0.04, n = 48). Columns (4) and (5) support H3: deposits rose by 0.83% and loans by 0.45% per 1% of customer growth. Inflation and the policy rate were mostly insignificant in the revenue equations, apart from a small negative effect of inflation on interest income. Put simply, more customers mainly mean more payment and service income and more deposits; lending grows as well, but more slowly.

Two checks qualify these results. When loans were added to column (1), the user coefficient lost significance because users and loans moved almost together (correlation 0.99), so the sample cannot separate a direct customer effect from the lending channel; the two are best read as one joint path. The growth model (2), estimated on 12 year-on-year observations, gave an insignificant coefficient (−0.15, SE 0.10), and the Engle–Granger test did not confirm cointegration (p = 0.46). The level elasticities therefore describe a strong common movement over four years rather than a settled long-run parameter.

Channels from customer growth to revenue

[2] Source: Author's calculation based on [1]; [2]; [3]. OLS, 2022Q1–2025Q4, model (1) for columns (1)–(3) and model (3) for columns (4)–(5); Newey–West HAC standard errors (3 lags) in parentheses; quarter dummies included. *** p < 0.01, ** p < 0.05, * p < 0.10.

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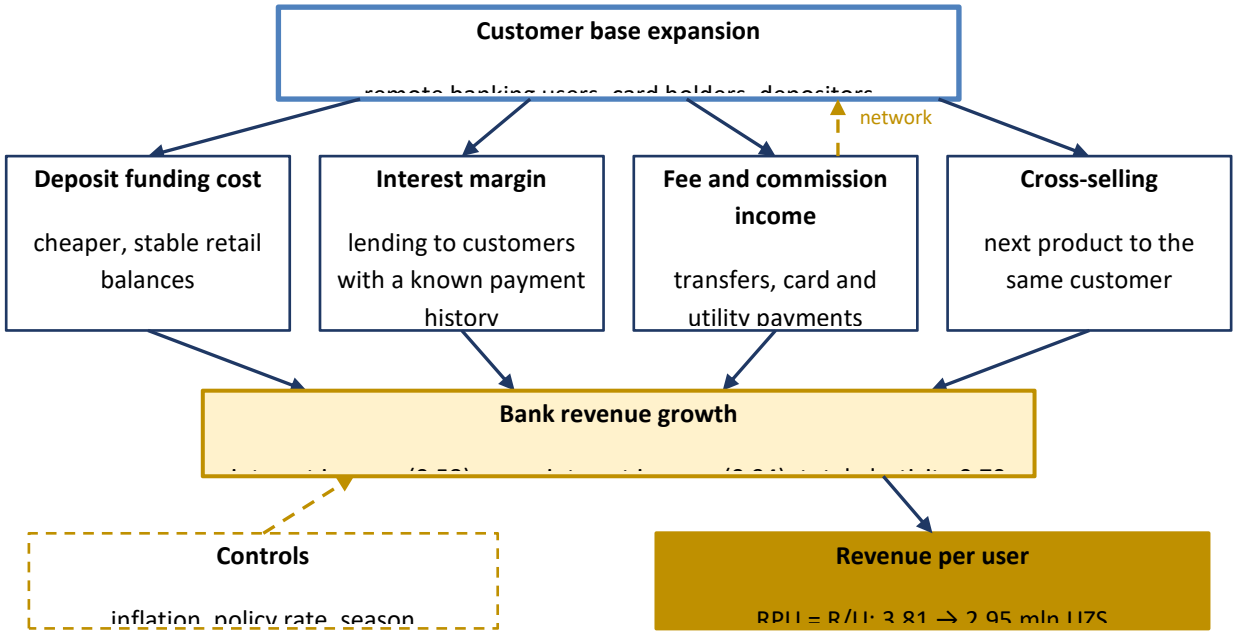


Figure 1. Channels from customer base expansion to bank revenue[3]

Figure 1 combines the estimates with the literature. New customers bring retail balances that are cheaper and more stable than wholesale funding, which matches the deposit elasticity of 0.83 [12]. A wider base also supplies borrowers with a visible payment history. Transfers, card and utility payments generate fees and explain the near-unit elasticity of non-interest income [6]. Cross-selling turns the base into a pipeline for further products [5], and the falling revenue per user shows the most room here.

CONCLUSION AND RECOMMENDATIONS

Over 2022–2025 the revenue elasticity with respect to remote banking users was about 0.7, non-interest income responded almost one for one, and the link ran mainly through deposits and fee-generating activity. The digital customer base has grown ahead of its monetisation and holds a sizeable income reserve.

Four recommendations follow. First, banks can track active users and products per customer rather than registered users, and tie acquisition budgets to cohort revenue. Second, cross-selling based on transaction data and the natural order of product adoption can raise revenue per user. Third, savings products inside mobile applications can turn payment activity into stable balances and strengthen the deposit funding channel. Fourth, Central Bank data on active and unique users and a separate line for fee income would make the customer-revenue link easier to monitor. Future research can test the elasticity on bank-level panels and cohort data.

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[3] Source: Author's development based on [4]; [5]; [6]; [12] and Table 2.

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