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Digital Retail Services in Commercial Banks: Methodological Foundations for Assessing Economic Efficiency

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Abstract: This paper develops methodological foundations for assessing the economic efficiency of digital retail services in commercial banks, including mobile and internet banking, remote lending, digital payments and e-wallets. Drawing on international empirical studies and official statistics of the Central Bank of the Republic of Uzbekistan, it documents the rapid growth of digital channels: in 2025, transactions via mobile banking applications reached UZS 646 trillion, a 1.6-fold increase, while banking assets grew by 20%. Existing approaches cost-benefit analysis, data envelopment analysis (DEA), the balanced scorecard and customer lifetime value (CLV) are compared. The paper proposes an integral efficiency index (IDRS) that combines financial, operational, customer and strategic-risk blocks with entropy-based weights, together with a procedure for estimating the discounted net effect of a digital project. The model is illustrated on conditional data for five hypothetical banks.

Keywords: Digital Banking, Retail Banking Services, Economic Efficiency, Remote Banking, Integral Index, Entropy Weighting, NPV, CLV, DEA

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1. Introduction

Retail banking is shifting from branches to digital platforms. According to the Central Bank of the Republic of Uzbekistan (CBU), transactions carried out through mobile banking applications reached UZS 646 trillion in 2025, 1.6 times the 2024 level; the number of bank cards in circulation rose to 68 million and the number of e-wallets to 25 million [1]. The share of card funds withdrawn in cash fell from 21.8% to 18.7%, indicating a steady move towards cashless settlement [1].

Digital transformation is a declared policy priority. The 2020–2025 banking reform strategy set tasks to automate banking processes, introduce automated scoring and digital identification, and expand remote services [2]. The “Digital Uzbekistan 2030” strategy provides for the development of digital economy infrastructure [3]. The legal framework rests on the laws “On banks and banking activity” [4] and “On payments and payment systems” [5]. Internationally, digital payments and mobile connectivity are regarded as key drivers of financial inclusion [6].

Yet there is still no single, scientifically grounded method for measuring the economic return that banks obtain from investment in digital channels. In practice, banks rely on volume indicators such as the number of users or transaction value. These do not capture cost savings, changes in the revenue mix, customer value or new risks such as cyber threats and fraud [7]. As a result, management decisions are taken on incomplete information.

The aim of this study is to develop a comprehensive, multi-criteria methodology for assessing the economic efficiency of digital retail services in commercial banks. The objectives are to:

1. Systematise theoretical and empirical research on the relationship between digital channels and bank performance;
2. Analyse the development of digital retail banking in uzbekistan using official statistics;
3. Propose a formalised model for estimating the net economic effect and an integral efficiency index;
4. Illustrate the model on conditional data and formulate recommendations for its implementation.

The contribution of the paper is that financial results, operational savings, customer value and digital risks are combined on a single measurement scale, and indicator weights are derived with the entropy method from the variability of the data rather than from expert opinion.

Literature Review

Digital channels and bank performance: empirical evidence

Studying the effects of technological progress on banking, Berger showed that information and payment technologies lowered the cost of banking services and increased economies of scale [8]. DeYoung, Lang and Nolle found that after adopting internet banking, US community banks increased their profitability and fee income and reallocated costs across delivery channels [9]. Hernando and Nieto showed for Spanish banks that the internet channel gradually reduced overhead expenses, with the positive effect on profitability becoming significant after about one and a half years for ROA and three years for ROE [10]. Ciciretti, Hasan and Zazzara reported a positive association between internet activities and both performance and stock returns of Italian banks [11].

Examining long-run effects, Scott, Van Reenen and Zachariadis used data on 6,848 banks in 29 countries in Europe and the Americas and found that digital innovation — adoption of the SWIFT network — had large long-term effects on profitability, that these effects were greater for small banks than for large ones, and that there were significant network effects [12]. These results confirm that efficiency should be assessed over a multi-year horizon rather than in a single year.

From a theoretical perspective, Vives argues that digital technology shifts the banking business model from competition on operating costs to competition based on information and customer data [13]. Thakor shows that fintech firms intensify competition for banks' traditional intermediation role [14]. Philippon documents that the unit cost of financial intermediation has not declined for decades and argues that digital technologies have the potential to reduce it [15]. Frost analyses the economic drivers of fintech adoption across countries, including the high cost and limited reach of traditional banking services [16]. The Basel Committee notes that fintech developments increase strategic, operational, cyber and compliance risks for banks [7], which justifies including a risk dimension in any efficiency assessment.

Methodological approaches to efficiency assessment

Four main approaches to assessing the efficiency of digital banking services can be distinguished (Table 1). The first is conventional financial analysis (ROA, ROE, cost-to-income ratio — CIR) and investment appraisal (NPV, ROI). The second is frontier analysis: data envelopment analysis (DEA) [17], [18] and stochastic frontier analysis (SFA). These methods are widely applied to banks [19], usually under the intermediation approach, which treats the bank as an intermediary converting funds into loans and other assets [20]. DEA has also been used to evaluate the efficiency of internet banking [21].

The third approach is the balanced scorecard proposed by Kaplan and Norton, which complements financial results with customer, internal-process and learning-and-growth measures [22]. Time-driven activity-based costing (TDABC) allows costs to be allocated precisely across channels and processes [23]. The fourth, customer-oriented approach

includes the technology acceptance model (TAM) [24], the SERVQUAL service-quality scale [25], the Net Promoter Score (NPS) [26] and customer lifetime value (CLV) [27].

Table 1. Comparison of approaches to assessing the efficiency of digital banking services

Approach	Key indicators	Strengths	Limitations
Financial (cost–benefit, NPV, ROI)	ROA, ROE, CIR, net fee income, NPV	Based on accounting data; easy to interpret	Channel-level cost allocation is difficult; ignores non-financial effects
Frontier analysis (DEA, SFA)	Technical, cost and scale efficiency	Handles multiple inputs and outputs simultaneously	Relative scores; results depend on the choice of inputs and outputs
Balanced scorecard	Financial, customer, process, learning and growth	Linked to strategy; comprehensive	Weights are often set subjectively
Customer-oriented (TAM, SERVQUAL, NPS, CLV)	Adoption, quality, loyalty, customer value	Captures long-term value	Relies on surveys and forecasts

Source: compiled by the author based on [19], [22], [27] and other studies.

The review shows that each approach captures only one facet of efficiency. In the Uzbek economic literature, digital banking services have been studied mainly in terms of their growth dynamics; an integral model combining all four approaches has not been sufficiently developed. This paper aims to fill that gap.

2. Materials and Method

The study uses systems analysis, comparative and indicator methods, time-series analysis and multi-criteria rating techniques. The data sources are the CBU annual reports for 2023–2025 [28], [29] and official data on cash circulation [30], legal and regulatory acts [2]–[5], and publications of international organisations [6], [7].

In general terms, economic efficiency is defined as the ratio of the result obtained to the resources spent:

$$Ef_{dig} = \frac{R_{dig}}{C_{dig}} \quad (1)$$

where R_{dig} is the result generated by the digital channel (additional revenue and cost savings) and C_{dig} is the cost of building and operating the channel. The channel is economically efficient if $Ef_{dig} > 1$.

The research was carried out in four stages:

1. A systematic literature review and comparison of existing assessment approaches (Section 2);
2. A dynamic analysis of digital retail services based on official data (Section 4);
3. Formalisation of the net-effect and integral-index model: normalisation of indicators, entropy weighting and aggregation (Section 5);
4. An illustration of the model on data for five hypothetical banks (Section 6).

Indicators were selected following the intermediation approach to bank efficiency [19], [20]: inputs are IT investment, operating expenses and staff numbers; outputs are the volume of digital transactions, active users and fee income. **Limitation:** because bank-level revenues and costs of digital channels are not publicly disclosed, the model is illustrated on conditional data. It is designed to be applied to a bank's internal management accounting data.

3. Development of Digital Retail Banking in Uzbekistan

3.1. Legal and institutional framework

The development of digital banking services is governed by the legislative reforms of 2019–2020 (Table 2). As of 2025, the country had 36 banks, 47 payment organisations and 233 non-bank credit organisations [1]. As of 1 January 2025, 28 commercial banks and 15 payment organisations were using Face ID technology [29], which allows customers to be onboarded remotely without visiting a branch.

Table 2. Key legal acts regulating digital banking services

Document	Date adopted	Main provisions relevant to digital services
Law “On payments and payment systems” (O‘RQ-578) [5]	01.11.2019	Legal basis for payment services, electronic money and payment organisations
Law “On banks and banking activity” (O‘RQ-580) [4]	05.11.2019	Banking activity, provision of banking services and requirements for remote services
Banking reform strategy 2020–2025 (PF-5992) [2]	12.05.2020	Process automation, scoring, digital identification, expansion of remote services; raising the share of non-state banks’ assets from 15% to 60%
“Digital Uzbekistan – 2030” strategy (PF-6079) [3]	05.10.2020	Development of digital infrastructure and the digital economy

Source: compiled by the author from lex.uz.

3.2. Key indicators of digital retail services

Table 3 presents the key indicators of digital retail banking for 2024–2025. All indicators show positive dynamics, with transactions through mobile applications growing particularly fast.

Table 3. Key indicators of digital retail banking services in Uzbekistan

Indicator	2024	2025	Change
Transactions via mobile applications, UZS trillion	≈404*	646	×1.6
Bank cards in circulation, million	61.7	68.0	+10.2%
E-wallets, million	≈20.8*	25.0	+20%
ATMs and information kiosks, units	29,909	40,090	+10,181
Payment terminals, thousand	≈426.5	431.0	+4,537 units
QR codes, thousand	≈107*	139	×1.3
Bank outlets operating 24/7, units	4,447	5,615	+1,168
Share of card funds withdrawn in cash, %	21.8	18.7	–3.1 p.p.
Share of cashless payments in bank receipts, %	40	43	+3 p.p.
Share of cashless payments in trade and services, %	44	48	+4 p.p.

Source: [1], [30]. * Author’s estimate: 2024 absolute values derived from the 2025 values and the officially reported growth rates.

The number of bank cards has grown steadily over the past three years: 46.2 million in 2023 (35% growth) [28] and 68.0 million in 2025 [1] (Fig. 1). The number of remote banking users reached 48.4 million in September 2024 (of which 47 million were individuals), up 23.1% year on year and 4.7 times over five years [31]. Since this figure

counts a customer's accounts at several banks separately, it reflects the reach of digital channels rather than the number of unique active customers.

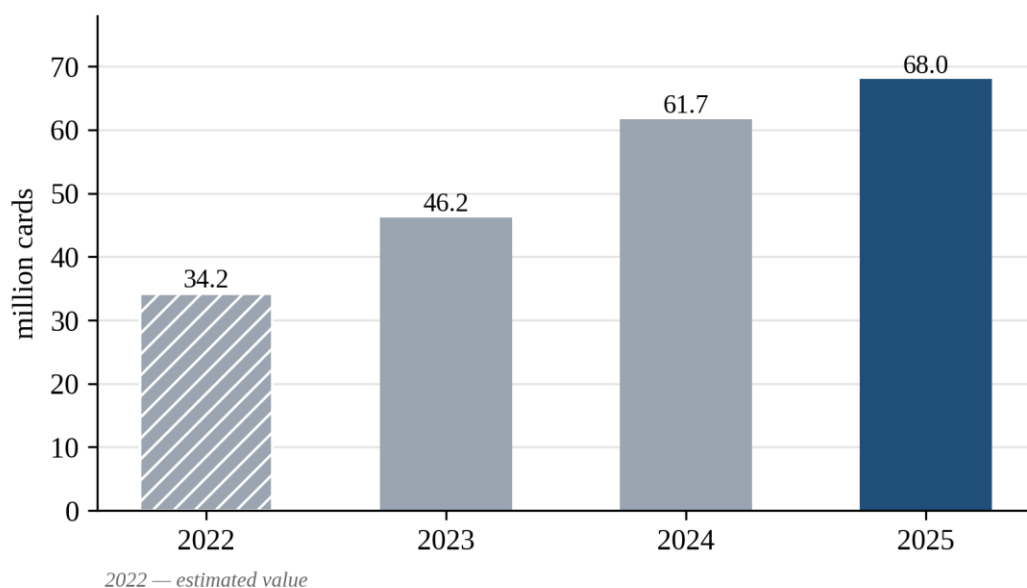


Figure 1. Bank cards in circulation, million

Source: author's calculation based on [1], [28]; the 2022 value is estimated from the 35% growth reported for 2023.

Digital channels are growing much faster than bank balance sheets (Fig. 2). In 2025, bank assets rose by 20% to UZS 925 trillion, whereas transactions via mobile applications grew by 60%, QR codes by 30% and 24/7 outlets by 26.3% [1]. This shows that a growing share of retail service flows is moving to digital channels. At the same time, sector stability was maintained: the capital adequacy ratio stood at 18.3% (against a 13% minimum) and non-performing loans at 3% [1].

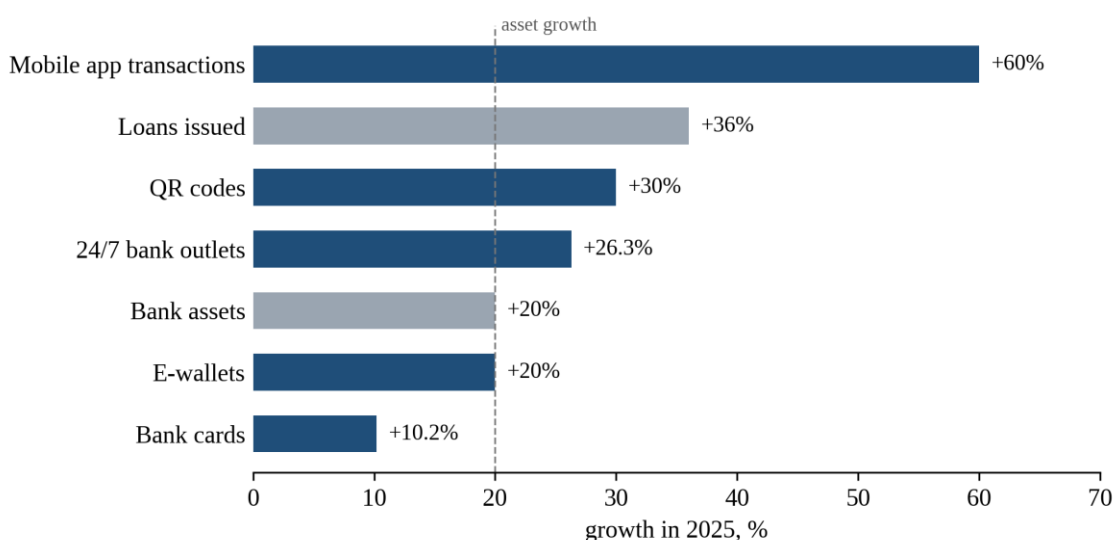


Figure 2. Growth rates of digital and balance-sheet indicators in 2025

Source: compiled by the author based on [1]. Dark bars — digital channel indicators; grey bars — balance-sheet indicators.

The share of cashless payments is also rising steadily: in bank receipts it increased from 38% in 2023 to 43% in 2025, and in trade and services from 44% in 2024 to 48% in

2025 [30] (Fig. 3). Lower demand for cash is a real source of savings for banks on cash handling, cash collection and related operations.

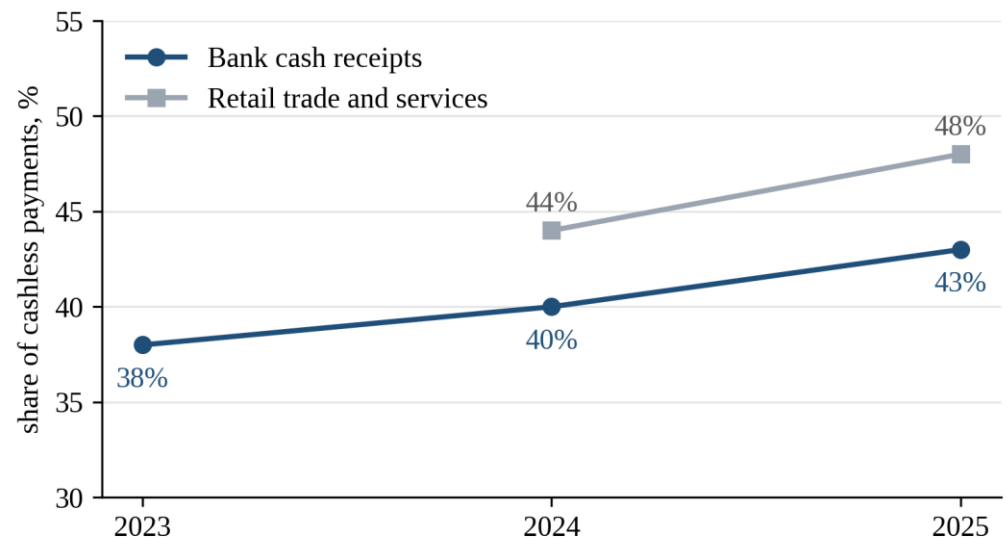


Figure 3. Share of cashless payments, %
Source: compiled by the author based on [30].

Three conclusions follow. First, digital retail services are growing faster than bank assets, meaning that the weight of service delivery is shifting to digital channels. Second, the contraction of cash circulation creates an opportunity to cut costs. Third, official statistics do not disclose the revenues, costs or unit transaction cost of digital channels. This points to the need for a bank-level methodological tool to assess economic efficiency.

4. Proposed Methodological Model for Assessing Economic Efficiency

4.1. Conceptual framework

The proposed model has two stages. In the first stage, the discounted net economic effect of a digital project and the customer-level effect are estimated. In the second stage, an integral efficiency index I_{DRS} (Digital Retail Services) is constructed from four blocks: financial (F), operational (O), customer (C) and strategic risk (R) (Fig. 4).

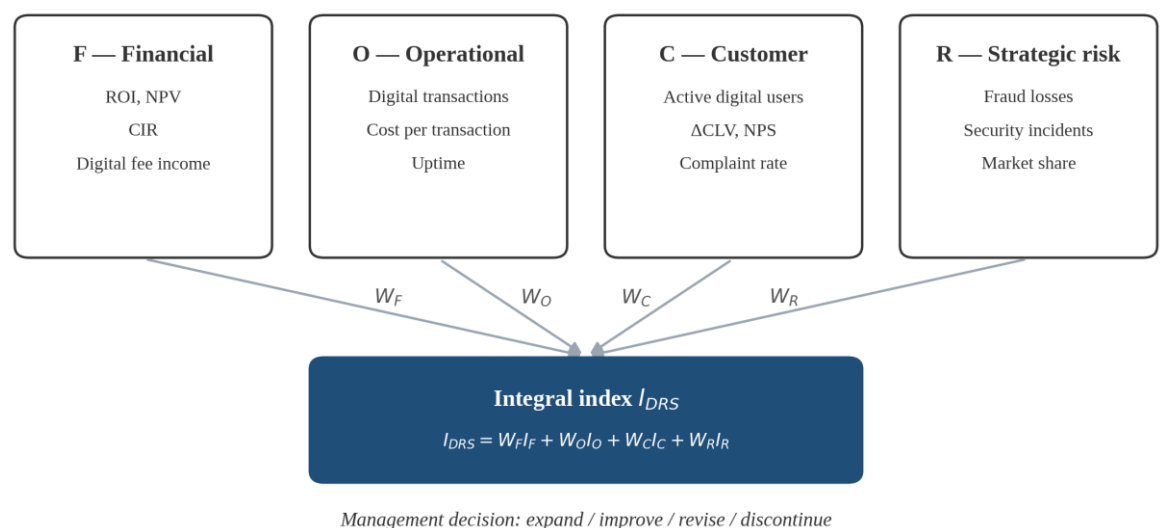


Figure 4. Conceptual model for assessing the efficiency of digital retail services
Source: developed by the author.

4.2. Net economic effect and investment efficiency

The net economic effect in period t is defined as the difference between the additional revenue generated by the digital channel plus cost savings, and the cost of running the channel:

$$E_t = \Delta R_t + S_t - OC_t \quad (2)$$

where ΔR_t is the additional interest and fee income attributable to the digital channel (new customers, online loans, payment fees); S_t is the cost saved by migrating transactions from branches to the digital channel; OC_t covers platform operation, licences, cybersecurity and fraud losses. Cost savings are calculated by transaction type:

$$S_t = \sum_{k=1}^K (c_k^{br} - c_k^{dig}) N_{k,t} \quad (3)$$

where c_k^{br} and c_k^{dig} are the unit costs of a type- k transaction in a branch and in the digital channel respectively, $N_{k,t}$ is the number of transactions migrated to the digital channel and K is the number of transaction types. The TDABC method is recommended for estimating channel-level unit costs [23]. Given an initial investment I_0 , the efficiency of the digital project is assessed with discounted indicators:

$$NPV = \sum_{t=1}^T \frac{E_t}{(1+r)^t} - I_0 \quad (4)$$

$$PI = \frac{\sum_{t=1}^T \frac{E_t}{(1+r)^t}}{I_0}, \quad DPP = \min \left(\tau : \sum_{t=1}^{\tau} \frac{E_t}{(1+r)^t} \geq I_0 \right) \quad (5)$$

where r is the discount rate (the bank's cost of capital, or the CBU policy rate plus a risk premium), T is the appraisal horizon, PI is the profitability index and DPP is the discounted payback period. In line with the findings of Hernando and Nieto and of Scott et al. [10], [12], the horizon should be at least 3–5 years.

4.3. Customer-level effect

The digital channel affects the length and profitability of a customer's relationship with the bank. This effect is measured through customer lifetime value (CLV) [27]:

$$CLV = \sum_{t=0}^T \frac{m_t \rho^t}{(1+d)^t} - AC \quad (6)$$

$$\Delta CLV = CLV^{dig} - CLV^{trad} \quad (7)$$

where m_t is the annual margin earned from the customer, ρ is the retention rate, d is the discount rate and AC is the customer acquisition cost; CLV^{dig} and CLV^{trad} are the average lifetime values of digital-channel and traditional-channel customers. $\Delta CLV > 0$ means that the digital channel increases customer value.

4.4. Indicator system of the integral index

The indicator system of the integral index is shown in Table 4. Indicators are either stimulants (higher is better, "+") or destimulants (higher is worse, "-").

Table 4. Blocks and indicators of the integral index

Block	Indicator	Calculation	Direction
F – financial	F1. Digital channel ROI	$\Sigma E_t / I_0$	+
	F2. Cost-to-income ratio (CIR)	operating expenses / operating income	–
	F3. Share of digital fee income	digital / total fee income	+
O – operational	O1. Digital share of transactions	digital / total transactions	+
	O2. Cost per digital transaction	channel cost / number of transactions	–
	O3. System availability (uptime)	actual / scheduled operating time	+
C – customer	C1. Share of active digital users	monthly active users (MAU) / total retail customers	+
	C2. Net Promoter Score (NPS)	% promoters – % detractors [26]	+
	C3. ΔCLV	Eq. (7)	+
R – strategic risk	R1. Fraud loss ratio	losses / digital transaction value, b.p.	–
	R2. Information security incidents	incidents per year	–

R3. Market share in digital transactions	bank's transactions / market total	+
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Source: developed by the author.

4.5. Normalisation and weighting

Because the indicators are measured in different units, they are rescaled to the interval [0, 1] by min–max normalisation, using Eq. (8) for stimulants and Eq. (9) for destimulants:

$$\tilde{x}_{ij} = \frac{x_{ij} - \min_i x_{ij}}{\max_i x_{ij} - \min_i x_{ij}} \quad (8)$$

$$\tilde{x}_{ij} = \frac{\max_i x_{ij} - x_{ij}}{\max_i x_{ij} - \min_i x_{ij}} \quad (9)$$

where x_{ij} is the value of indicator j for bank (or period) i , $i = 1, \dots, n$. Indicator weights are determined objectively using Shannon entropy [32]: an indicator that differs more across banks receives a higher weight:

$$p_{ij} = \frac{\tilde{x}_{ij}}{\sum_{i=1}^n \tilde{x}_{ij}} \quad (10)$$

$$e_j = -\frac{1}{\ln n} \sum_{i=1}^n p_{ij} \ln p_{ij} \quad (11)$$

$$w_j = \frac{1 - e_j}{\sum_{k \in b} (1 - e_k)}, \quad j \in b \quad (12)$$

where e_j is the entropy of indicator j ($0 \leq e_j \leq 1$) and w_j is its weight within block b . Since the logarithm is undefined when $\tilde{x}_{ij} = 0$, a small positive constant (0.01) is added to the normalised values in practical calculations.

4.6. Integral index and its interpretation

The block indices and the integral index are calculated as follows:

$$I_b = \sum_{j \in b} w_j \tilde{x}_j, \quad b \in \{F, O, C, R\} \quad (13)$$

$$I_{DRS} = W_F I_F + W_O I_O + W_C I_C + W_R I_R, \quad \sum_b W_b = 1 \quad (14)$$

The block weights W_b are set by the supervisory board or by experts in line with the bank's strategy. As a baseline, $W_F = 0.35$, $W_O = 0.25$, $W_C = 0.25$ and $W_R = 0.15$ are suggested (author's proposal). The result is interpreted using the scale in Table 5.

Table 5. Interpretation scale for the integral index

IDRS value	Efficiency level	Recommended management decision
0.75–1.00	High	Expand the digital channel and launch new products
0.50–0.74	Medium	Target improvements at the weakest block
0.25–0.49	Low	Revise the business model and cost structure
0.00–0.24	Critical	Suspend or reallocate investment

Source: developed by the author.

5. Illustration of the Model: A Conditional Example

To demonstrate how the model is applied, conditional (illustrative) data are used. The data do not refer to real banks and were chosen only to show the calculation procedure.

5.1. Discounted effect of a digital project

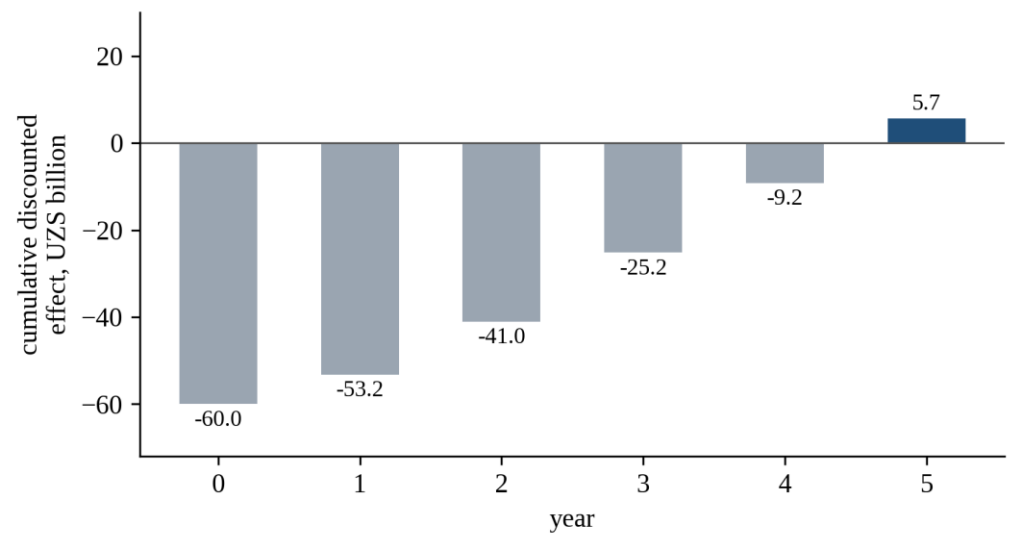
Suppose a bank invests $I_0 = \text{UZS } 60$ billion in a mobile banking platform and the discount rate is $r = 18\%$. The annual net effect calculated with Eqs. (2)–(3) is shown in Table 6.

Table 6. Calculation of the effect of a digital project (conditional example), UZS billion

Year (t)	Net effect E_t	Discount factor	Discounted effect	Cumulative discounted effect
0	—	1.000	—	-60.00
1	8.0	0.847	6.78	-53.22
2	17.0	0.718	12.21	-41.01
3	26.0	0.609	15.82	-25.19
4	31.0	0.516	15.99	-9.20
5	34.0	0.437	14.86	5.66

Source: author's calculation (conditional data).

The calculation gives $NPV = \text{UZS } 5.66 \text{ billion} > 0$ and $PI = 1.09 > 1$, and the discounted payback falls in the fifth year (Fig. 5). The low effect in the first three years is consistent with the lag documented by Hernando and Nieto [10]: had the project been judged on one or two years of results alone, it would have been deemed inefficient.

**Figure 5.** Cumulative discounted effect (conditional example), UZS billion
Source: author's calculation.

5.2. Calculating the integral index

To calculate the integral index, eight indicators — two from each block — were taken for five hypothetical banks, A to E (Table 7).

Table 7. Initial indicators for the hypothetical banks

Code	Indicator	Dir.	Bank A	Bank B	Bank C	Bank D	Bank E
F1	Digital channel ROI, %	+	42	28	55	18	35
F2	CIR, %	—	48	44	58	62	50
O1	Digital share of transactions, %	+	78	64	86	52	81
O2	Cost per digital transaction, UZS	—	310	420	260	540	290
C1	Share of active digital users (MAU), %	+	61	47	69	58	55
C2	NPS, points	+	34	21	41	38	29
R1	Fraud loss ratio, b.p.	—	3.1	2.4	5.6	4.2	3.9
R2	Security incidents per year	—	4	3	9	5	6

Source: conditional (illustrative) data.

Table 8 reports the entropy values and within-block weights calculated with Eqs. (8)–(12). The weights turned out to be close to each other (0.48–0.52) because all indicators vary across banks to a similar degree; larger differences are expected with real data.

Table 8. Entropy and weights of the indicators

Code	Block	Entropy e_j	Degree of diversification $1 - e_j$	Within-block weight w_j
F1	F	0.8129	0.1871	0.496
F2	F	0.8102	0.1898	0.504
O1	O	0.8368	0.1632	0.515
O2	O	0.8465	0.1535	0.485
C1	C	0.8324	0.1676	0.514
C2	C	0.8418	0.1582	0.486
R1	R	0.8424	0.1576	0.518
R2	R	0.8533	0.1467	0.482

Source: author's calculation.

The block indices and the integral index were calculated with Eqs. (13)–(14) (Table 9, Fig. 6).

Table 9. Block and integral indices of the hypothetical banks

Bank	I_F	I_O	I_C	I_R	I_{DRS}	Level	Rank
Bank A	0.714	0.792	0.643	0.806	0.730	Medium	1
Bank C	0.608	1.000	1.000	0.000	0.713	Medium	2
Bank E	0.564	0.872	0.381	0.516	0.588	Medium	3
Bank B	0.638	0.390	0.000	1.000	0.471	Low	4
Bank D	0.000	0.000	0.670	0.548	0.250	Low	5

Source: author's calculation. Block weights: $W_F = 0.35$; $W_O = 0.25$; $W_C = 0.25$; $W_R = 0.15$.

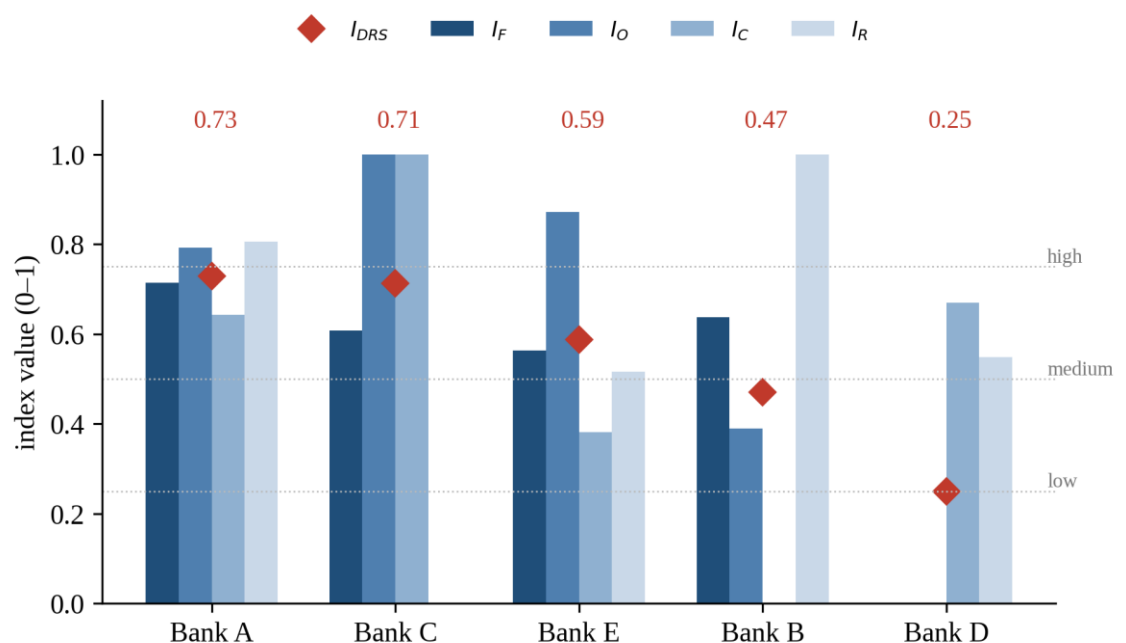


Figure 6. Block indices and integral index of the hypothetical banks

Source: author's calculation.

The results show the diagnostic value of the integral index. Bank A (0.73) and Bank C (0.71) have similar overall scores but very different profiles. Bank C leads in the operational and customer blocks but has the lowest risk score ($I_R = 0$), with the highest

fraud losses and number of incidents; its priority should be investment in cybersecurity. Bank B manages risk well but has the weakest customer block ($I_c = 0$). Bank D has the lowest financial and operational scores and should revisit its digital business model. Such structural differences would remain hidden if only a single indicator, such as the number of users or transaction value, were used.

6. Discussion

The proposed model complements existing approaches. It combines the precision of financial analysis (NPV, ROI), the breadth of the balanced scorecard [22] and the long-term perspective of customer-oriented methods [27]. The entropy method reduces subjectivity in weighting. Including the digital risks highlighted by the Basel Committee [7] as a separate block yields a risk-adjusted assessment of digital channel growth.

DEA is recommended to cross-check the integral index results [17], [21]. In the input-oriented CCR model, the efficiency θ^* of bank o is found as the solution of the following linear programme:

$$\theta^* = \min \theta, \quad \sum_{i=1}^n \lambda_i x_{si} \leq \theta x_{so}, \quad \sum_{i=1}^n \lambda_i y_{ri} \geq y_{ro}, \quad \lambda_i \geq 0 \quad (15)$$

where x_{si} is input s of bank i (IT spending, operating expenses), y_{ri} is output r (digital transactions, active users, fee income) and λ_i are intensity weights. Banks with $\theta^* = 1$ lie on the efficiency frontier. Under variable returns to scale, the BCC model is used [18]. A high rank correlation between the integral index and DEA scores would support the robustness of the assessment.

The model also has limitations. First, min–max normalisation makes the result depend on the best and worst values in the sample; when assessing a single bank over time, target (strategic) values should be used as benchmarks. Second, estimating ΔR_t and ΔCLV accurately requires controlling for self-selection bias when comparing digital and traditional customers. Third, the model still needs to be tested empirically on real bank panel data.

7. Conclusion

The study shows that assessing the efficiency of digital retail services by volume indicators alone is insufficient. Although mobile transactions in Uzbekistan grew 1.6-fold in 2025 [1], the impact of this growth on bank revenues and costs is not visible in official statistics. The main conclusions are as follows:

1. The profitability effect of digital channels emerges with a lag [10], [12]. Efficiency should therefore be assessed over a discounted horizon of at least 3–5 years (NPV, PI, DPP, CLV) rather than in a single year.
2. The proposed integral index I_{DRS} combines financial, operational, customer and risk blocks on a single scale. The entropy method sets indicator weights objectively, and the block indices point to the area that needs management attention.
3. The conditional example shows that banks with similar overall scores can differ fundamentally in structure, confirming the diagnostic value of the model.

Practical recommendations:

- Commercial banks should introduce channel-level cost allocation (TDABC) and separate management accounting for digital channels;
- The Central Bank should add indicators on monthly active digital users, digital fee income and digital fraud losses to its statistical reporting;
- Banks should include NPV and the I_{DRS} index among the investment committee's criteria for approving digital projects and recalculate the index quarterly;
- Integral index results should be regularly cross-checked with DEA and reported to the supervisory board.

Future research could test the model empirically on panel data for Uzbek commercial banks and estimate the impact of digital channels on bank profitability econometrically.

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