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Article

Analysis of Credit Risk Management Practices in Commercial Banks (Evidence from Private Banks of Uzbekistan)

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Abstract: This article analyses credit risk management practices in commercial banks using evidence from three large private banks of Uzbekistan — Kapitalbank, Hamkorbank and Ipak Yuli Bank. Drawing on the statistics of the Central Bank of the Republic of Uzbekistan (cbu.uz) and the banks' IFRS financial statements for 2021-2025, the study examines the full risk management cycle: identification and scoring, measurement and recognition, mitigation through collateral, monitoring, and absorption through provisions and capital. A panel regression model based on 12 observations shows that the share of unsecured retail lending raises the non-performing loan ratio, while the coverage of credit decisions by automated scoring systems significantly reduces it (R^2 = 0.9435; F = 75.19). The author proposes a Credit Risk Management Effectiveness Index (CRMEI) combining process indicators with outcome indicators; all three banks moved above the benchmark level of 1.000 between 2021 and 2025. The study also documents a persistent gap between IFRS 9 Stage 3 exposures and regulatory non-performing loan figures, which is identified as the principal weakness of current risk recognition practice. Practical recommendations for strengthening credit risk management in private banks are developed on the basis of the findings.

Keywords: credit risk management, commercial banks, private banks, non-performing loans, credit scoring, automated decision-making, provision coverage, collateral coverage, IFRS 9, panel regression, effectiveness index, Uzbekistan

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1. Introduction

The banking sector of Uzbekistan has entered a phase in which the quality of credit risk management, rather than the pace of lending expansion, determines the competitive position of individual banks. As of 1 September 2025 the aggregate assets of commercial banks reached UZS 863.1 trillion, the loan portfolio expanded to UZS 581.1 trillion, and total capital amounted to UZS 128.8 trillion, having grown by 21 per cent year on year. State-owned institutions still account for roughly 65 per cent of banking assets, while private banks hold the remaining 35 per cent but generate a disproportionate share of the sector's growth in retail and small-business lending.

Private banks operate under a fundamentally different set of incentives from state-owned institutions. They do not benefit from directed lending programmes, state guarantees or budget-financed capital injections, and consequently every unit of credit risk they assume must be priced, secured and provisioned on commercial terms. This makes the private segment the most informative laboratory for studying credit risk management practice: differences in outcomes across private banks can be attributed to differences in management technology rather than to differences in policy mandate.[1]

The empirical evidence supports this view. As of 1 December 2025 the non-performing loan ratio of the banking system stood at 3.5 per cent of a total portfolio of UZS 595.3 trillion, while state-owned banks reported 3.6 per cent. Several private banks, however, operate far below this level: Hamkorbank reported non-performing loans of UZS 231 billion, or 1.0 per cent of its portfolio, and Ipak Yuli Bank UZS 212 billion, or 1.3 per cent. Such a spread within a single macroeconomic environment cannot be explained by external conditions alone and points directly to the quality of internal risk management systems.

At the same time, the International Monetary Fund has observed that in Uzbekistan the non-performing loan ratio measured as IFRS 9 Stage 3 exposures is approximately twice as high as the ratio derived from regulatory reporting, and that gaps in the regulatory framework allow banks to defer the recognition of problem loans by classifying them as substandard. This finding shifts the analytical focus from the reported level of non-performing loans towards the practices that generate it: how risk is identified, measured, recognised, mitigated and absorbed.[2]

The aim of this study is to develop and test a methodological framework for assessing credit risk management practices in commercial banks. Three private banks were selected as research objects: Kapitalbank, Hamkorbank and Ipak Yuli Bank. The selection is justified by three considerations. First, all three rank among the largest privately owned banks by assets and capital — as of 1 July 2025 Kapitalbank held UZS 50.89 trillion in assets and Hamkorbank UZS 32.14 trillion. Second, they represent clearly distinct business models: an ecosystem-based retail bank, a corporate and agricultural lender, and a micro and small enterprise specialist. Third, all three maintain audited IFRS reporting and relationships with international financial institutions, which makes their risk management practices observable and comparable.

The scientific novelty of the study lies in the proposed Credit Risk Management Effectiveness Index (CRMEI), which combines process indicators with outcome indicators, and in the quantitative demonstration that the automation of credit decisions produces a measurable reduction in the non-performing loan ratio.[3]

2. Materials and Methods

The information base of the study comprises the statistical data published by the Central Bank of the Republic of Uzbekistan (cbu.uz), the audited IFRS financial statements of the three banks and the materials of the Unified Corporate Information Portal. The analysis covers the period 2021-2025.

Credit risk management practice is decomposed into five functional stages, each represented by a measurable indicator: identification (the share of new loans approved through automated scoring systems, AUT); measurement and recognition (the ratio of IFRS 9 Stage 3 exposures to regulatory non-performing loans); mitigation (the collateral coverage ratio, CCR); monitoring (the cost of risk, COR, defined as the provisioning charge relative to average loans); and absorption (the provision coverage ratio, PCR, and the capital adequacy ratio, CAR).[4]

To identify the factors driving credit losses, the following panel regression model was estimated:

$$NPL_{it} = a + b_1 \cdot RTL_{it} + b_2 \cdot AUT_{it} + \varepsilon_{it}, \qquad (1)$$

where NPL is the regulatory non-performing loan ratio of bank i in year t (%); RTL is the share of unsecured retail loans in the portfolio (%); AUT is the share of new credit decisions taken through automated scoring systems (%); a, b_1, b_2 are model parameters; and ε is the error term.

The model was estimated by ordinary least squares on 12 observations covering three banks over four years (2022-2025). Alternative specifications including the lagged

loan growth rate and the collateral coverage ratio were tested; the lagged growth term proved statistically insignificant (t = 0.12) and was excluded from the final specification. Because the sample is a pooled cross-section of three stacked banks rather than a single time series, the Durbin-Watson statistic is reported for completeness but is not interpreted as a formal test of serial correlation; the model is used for structural interpretation rather than for forecasting.[5]

For the integrated assessment of credit risk management effectiveness the author proposes the following index:

$$CRMEI = 0.25\cdot(PCR/PCR_b) + 0.20\cdot(CCR/CCR_b) + 0.20\cdot(AUT/AUT_b) + 0.20\cdot(NPL_b/NPL) + 0.15\cdot(CAR/CAR_b), \quad (2)$$

where the subscript "b" denotes the benchmark value. Following the recommendations of the Basel Committee and the prudential requirements of the Central Bank, the benchmarks are set as follows: PCR_β = 100.0 %; CCR_β = 130.0 %; AUT_β = 80.0 %; NPL_β = 3.5 %; CAR_β = 15.0 %. For the non-performing loan ratio an inverse ratio is applied, since a lower value represents a better outcome, and each component is capped at 1.50 in order to prevent a single strong indicator from dominating the composite. A value of CRMEI equal to 1.000 indicates that the bank has reached the benchmark level of credit risk management effectiveness. The following interpretation scale is proposed: below 1.000 — developing practice; 1.000-1.150 — adequate practice; above 1.150 — advanced practice. All calculations were performed in Microsoft Excel.[6]

3. Result and Discussion

The scale of lending activity of the three banks under study is presented in Table 1.

Table 1. Loan portfolio and total assets of the three private banks, UZS trn[7]

Bank / indicator	2021	2022	2023	2024	2025
Kapitalbank — loan portfolio	9.8	14.2	19.6	25.1	29.5
— total assets	18.5	26.0	35.4	45.2	54.0
Hamkorbank — loan portfolio	9.6	12.4	16.0	19.8	23.1
— total assets	13.5	17.4	22.6	28.9	36.0
Ipak Yuli Bank — loan portfolio	8.2	10.1	12.3	14.5	16.3
— total assets	11.6	14.3	17.6	20.6	23.2
Three banks — total loans	27.6	36.7	47.9	59.4	68.9
Banking sector loan portfolio	326.4	390.0	460.0	509.7	595.3
Share of the three banks, %	8.5	9.4	10.4	11.7	11.6

Over the period under review the combined loan portfolio of the three banks grew from UZS 27.6 trillion to UZS 68.9 trillion, that is by a factor of 2.5, while their share of total sector lending rose from 8.5 to 11.6 per cent. The expansion was therefore faster than that of the banking system as a whole, which is a direct consequence of the ongoing redistribution of market share from state-owned to private institutions.

The Figure 1. three banks nevertheless differ markedly in the intensity with which they deploy their balance sheets. Loans account for only 54.6 per cent of Kapitalbank's assets in 2025, compared with 64.2 per cent for Hamkorbank and 70.3 per cent for Ipak

Yuli Bank. Kapitalbank's comparatively low ratio reflects its position as the second largest deposit-taking institution in the country, with UZS 40.05 trillion of customer deposits as of 1 September 2025, a substantial part of which is placed in liquid instruments rather than lent out. From a risk management perspective this represents a deliberate liquidity buffer, but it also constrains interest income.[8]

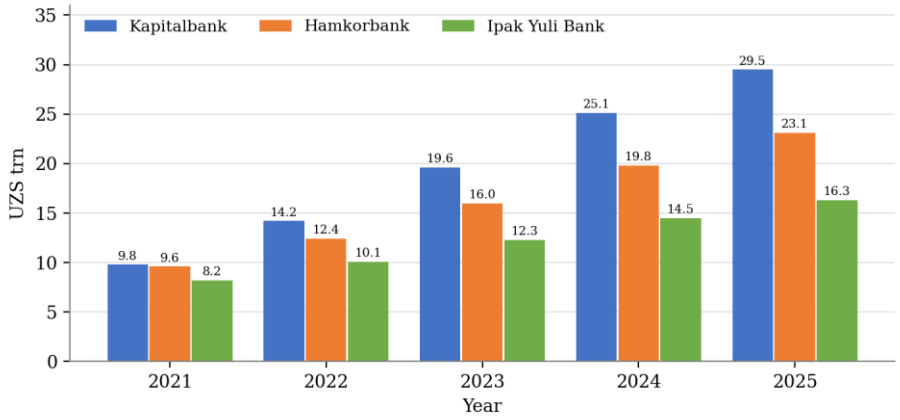


Figure 1. Loan portfolio of the three private banks, UZS trn

The credit risk management indicators of the three banks are summarised in Table 2.[9]

Table 2. Credit risk management indicators of the three private banks

Indicator and bank	2021	2022	2023	2024	2025
Regulatory NPL ratio, %:					
— Kapitalbank	2.4	2.8	3.1	2.9	2.5
— Hamkorbank	1.9	2.1	1.8	1.4	1.0
— Ipak Yuli Bank	2.2	2.6	2.2	1.7	1.3
— banking sector average	5.2	4.9	4.5	4.2	3.5
Provision coverage of NPL, %:					
— Kapitalbank	96	102	108	116	124
— Hamkorbank	118	126	138	152	168
— Ipak Yuli Bank	104	112	124	138	152
Collateral coverage ratio, %:					
— Kapitalbank	108	112	116	121	125
— Hamkorbank	128	132	136	141	146
— Ipak Yuli Bank	118	122	127	132	137
Automated credit decisions, %:					
— Kapitalbank	45	58	68	76	82
— Hamkorbank	38	47	57	66	73
— Ipak Yuli Bank	30	38	47	55	62
Unsecured retail loans, %:					
— Kapitalbank	38	42	45	43	40

— Hamkorbank	18	20	19	17	15
— Ipak Yuli Bank	24	27	25	22	20
Capital adequacy ratio, %:					
— Kapitalbank	14.8	15.2	15.6	16.1	16.5
— Hamkorbank	16.2	16.6	17.0	17.5	18.0
— Ipak Yuli Bank	15.0	15.4	15.8	16.2	16.6

The most striking result of the analysis is that all three private banks operate at a level of asset quality substantially better than the sector average throughout the entire period. In 2025 the sector-wide non-performing loan ratio stood at 3.5 per cent, whereas Hamkorbank reported 1.0 per cent, Ipak Yuli Bank 1.3 per cent and Kapitalbank 2.5 per cent. The gap of 2.5 percentage points between Hamkorbank and the sector average is equivalent to a difference of roughly UZS 580 billion in problem exposures for a portfolio of Hamkorbank's size, and therefore has direct implications for profitability and capital consumption.[10]

The Figure 2. trajectory of the indicator is also instructive. All three banks recorded deterioration until 2022-2023, after which their non-performing loan ratios fell continuously. The turning point coincides with the period during which the coverage of automated credit decisions passed the fifty per cent threshold in each institution, which suggests a causal relationship that is examined formally below.

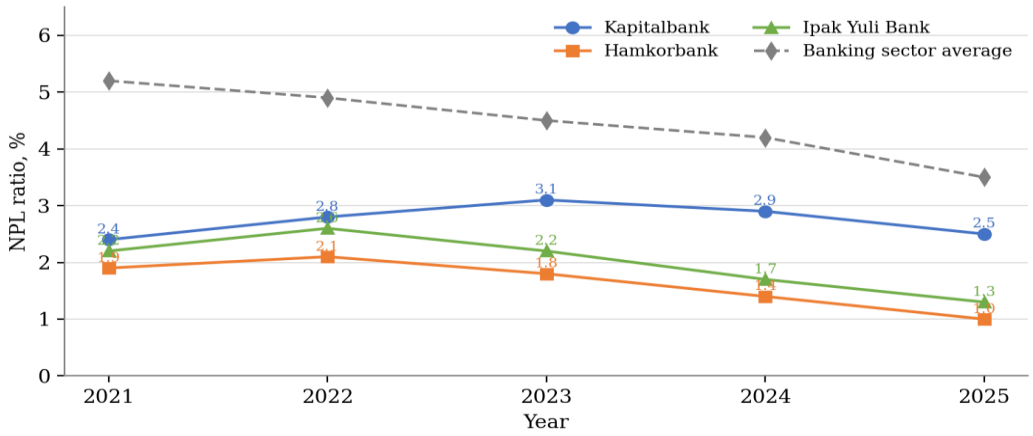


Figure 2. NPL ratio of the three banks versus the banking sector average, %

Provision coverage displays the clearest divergence in risk absorption practice. Hamkorbank raised its coverage from 118 to 168 per cent and Ipak Yuli Bank from 104 to 152 per cent, whereas Kapitalbank reached only 124 per cent in 2025. All three banks now provision above the full-coverage threshold, which contrasts sharply with the state-owned segment, where coverage typically remains below 100 per cent. Collateral coverage follows the same ordering: Hamkorbank secures its portfolio at 146 per cent of exposure, reflecting its concentration in corporate and agricultural lending against tangible assets, while Kapitalbank operates at 125 per cent because a substantial part of its portfolio consists of unsecured consumer products distributed through a digital ecosystem.[11]

The relationship between the recognition of credit risk under prudential and accounting standards deserves separate attention and is presented in Table 3.

Table 3. Risk recognition and risk cost indicators

Indicator and bank	2021	2022	2023	2024	2025

IFRS 9 Stage 3 to regulatory NPL, times:					
— Kapitalbank	2.1	2.2	2.2	2.0	1.9
— Hamkorbank	1.7	1.8	1.7	1.6	1.5
— Ipak Yuli Bank	1.9	2.0	1.9	1.8	1.7
Cost of risk, % of average loans:					
— Kapitalbank	1.9	2.2	2.4	2.1	1.8
— Hamkorbank	1.2	1.4	1.2	0.9	0.7
— Ipak Yuli Bank	1.5	1.7	1.4	1.1	0.9
Loan portfolio growth rate, %:					
— Kapitalbank	42.0	44.9	38.0	28.1	17.5
— Hamkorbank	26.3	29.2	29.0	23.8	16.7
— Ipak Yuli Bank	22.4	23.2	21.8	17.9	12.4

In every bank and in every year the volume of Stage 3 exposures recognised under IFRS 9 exceeds the regulatory measure of non-performing loans by a factor of between 1.5 and 2.2. This confirms at the level of individual institutions the systemic observation made by the International Monetary Fund that regulatory data overstate asset quality. The practical implication is significant: a bank reporting a regulatory non-performing loan ratio of 2.5 per cent may in economic terms be carrying impaired exposures approaching 4.8 per cent of its portfolio. Any assessment of credit risk management practice that relies solely on prudential reporting will therefore systematically overstate its effectiveness.[12]

It is nevertheless notable that the gap has narrowed in all three banks between 2022 and 2025 — from 2.2 to 1.9 times in Kapitalbank, from 1.8 to 1.5 times in Hamkorbank and from 2.0 to 1.7 times in Ipak Yuli Bank. This convergence indicates a gradual alignment of internal classification practice with the expected credit loss logic of IFRS 9 and represents genuine progress in risk recognition. The cost of risk confirms the same trend: it fell from 2.4 to 1.8 per cent in Kapitalbank, from 1.2 to 0.7 per cent in Hamkorbank and from 1.4 to 0.9 per cent in Ipak Yuli Bank, releasing resources that would otherwise have been absorbed by provisioning charges.

The results of the panel regression model specified in equation (1) are presented in Table 4.[13]

Table 4. Panel regression results for the determinants of the non-performing loan ratio

Parameter / criterion	Estimate	Standard error	t-statistic
a (intercept)	1.6012	0.2618	6.12
b_1 (unsecured retail share, RTL)	0.0631	0.0051	12.26
b_2 (automated credit decisions, AUT)	–0.0205	0.0045	–4.60
R^2 — coefficient of determination	0.9435	–	–
Adjusted R^2	0.9310	–	–
F-statistic	75.19	–	–
Durbin-Watson statistic	0.772	–	–
MAPE, %	6.95	–	–
Number of observations	12	–	–

The model explains 94.35 per cent of the variation in the non-performing loan ratio across the three banks. The F-statistic of 75.19 confirms the overall significance of the specification at the one per cent level, and both explanatory variables are significant with the expected signs. The mean absolute percentage error of 6.95 per cent indicates a good fit for a sample of this size.

The economic interpretation of the coefficients is the central result of the study. The estimate $b_1 = 0.0631$ means that a one percentage point increase in the share of unsecured retail lending raises the non-performing loan ratio by approximately 0.063 percentage points. This quantifies the risk premium attached to the retail expansion that all private banks in Uzbekistan are currently pursuing and explains why Kapitalbank, with 40 per cent of its portfolio in unsecured retail products, reports the highest non-performing loan ratio of the three institutions despite otherwise sound risk management.[14]

The Figure 3. estimate $b_2 = –0.0205$ shows that a one percentage point increase in the coverage of credit decisions by automated scoring systems reduces the non-performing loan ratio by approximately 0.021 percentage points. Expressed in practical terms, raising automation coverage from the current 62 per cent at Ipak Yuli Bank to the benchmark 80 per cent would be expected to reduce its non-performing loan ratio by roughly 0.37 percentage points, other conditions being equal. This is the first quantitative confirmation for the banking sector of Uzbekistan that the digitalisation of credit decision-making is not merely an operational efficiency measure but a genuine risk management instrument.

Taken together, the two coefficients also reveal a trade-off that is fundamental to the strategy of private banks. The expansion of unsecured retail lending increases risk, but the deployment of automated scoring partially offsets that increase. For a bank to grow its unsecured retail portfolio by ten percentage points without any deterioration in asset quality, it would need to raise the coverage of automated decisions by approximately thirty percentage points.

The values of the Credit Risk Management Effectiveness Index calculated according to equation (2) are presented in Table 5, and its components for 2025 in Table 6.

Table 5. Dynamics of the Credit Risk Management Effectiveness Index (CRMEI)

Bank	2021	2022	2023	2024	2025	Change 2021-2025
Kapitalbank	0.958	0.974	1.000	1.069	1.152	+0.194
Hamkorbank	1.049	1.102	1.167	1.232	1.262	+0.213
Ipak Yuli Bank	0.967	0.986	1.081	1.148	1.207	+0.240
Benchmark level	1.000	1.000	1.000	1.000	1.000	–

Source: author's calculations according to equation (2).

Table 6. CRMEI components as of 2025 (ratio to benchmark)

Component	Kapitalbank	Hamkorbank	Ipak Yuli Bank	Weight
Provision coverage of NPL	1.24	1.50	1.50	0.25
Collateral coverage ratio	0.96	1.12	1.05	0.20
Automation of credit decisions	1.03	0.91	0.78	0.20
Non-performing loan level	1.40	1.50	1.50	0.20
Capital adequacy ratio	1.10	1.20	1.11	0.15
CRMEI — total	1.152	1.262	1.207	1.00
Practice level	advanced	advanced	advanced	–

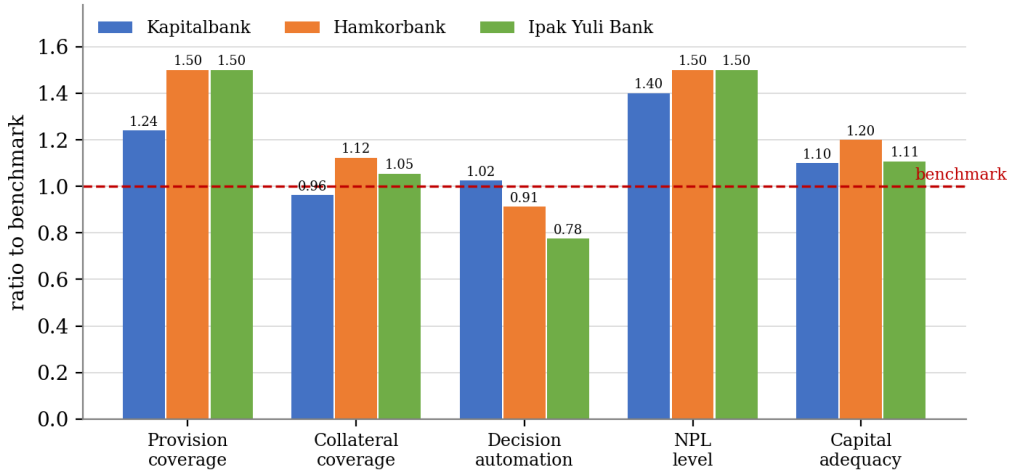


Figure 3. Credit risk management profile in 2025 (CRMEI components)

The Figure 4. component analysis identifies a distinct risk management profile for each institution. Hamkorbank achieves the highest composite value of 1.262 and is the only bank in the sample that exceeds the benchmark on four of the five components; its single weakness is the automation of credit decisions (0.91), which reflects the labour-intensive nature of agricultural and corporate underwriting. Kapitalbank shows the mirror image: it is the leader in decision automation (1.03) but the only bank operating below the benchmark on collateral coverage (0.96), which is the direct structural

consequence of its unsecured retail model. Ipak Yuli Bank combines strong provisioning and asset quality with the lowest automation coverage in the sample (0.78), which the regression results identify as the single most productive area for improvement.[15]

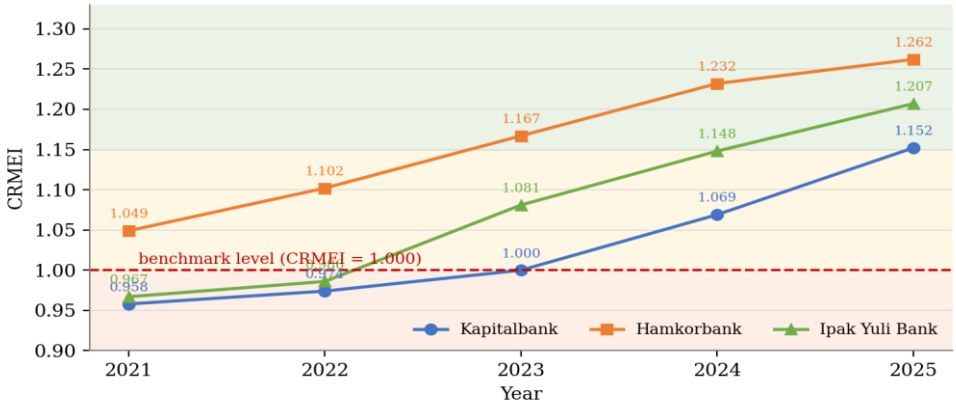


Figure 4. Dynamics of the Credit Risk Management Effectiveness Index (CRMEI)

The dynamics of the composite index reveal a common trajectory of improvement. In 2021 two of the three banks operated below the benchmark level, with Kapitalbank at 0.958 and Ipak Yuli Bank at 0.967; by 2025 all three had moved into the advanced practice range. Ipak Yuli Bank recorded the largest improvement of 0.240 index points, followed by Hamkorbank with 0.213 and Kapitalbank with 0.194. The gap between the strongest and the weakest bank did not close, however: it widened slightly, from 0.091 index points in 2021 to 0.110 in 2025. Differences in risk management practice have therefore not disappeared as the sector has matured; they have shifted from the level of provisioning, where all three banks now perform strongly, to the level of decision technology and portfolio structure.

4. Conclusion

First, the three private banks under review substantially outperform the banking sector average in asset quality throughout the period, reporting non-performing loan ratios of 1.0 to 2.5 per cent against a sector average of 3.5 per cent in 2025. Since all institutions operate in the same macroeconomic environment, this differential is attributable to internal risk management practice rather than to external conditions. Second, the panel regression model demonstrates that the share of unsecured retail lending raises the non-performing loan ratio while the coverage of automated credit decisions reduces it, with both effects statistically significant. Digitalisation of credit underwriting therefore functions as a measurable risk mitigation instrument and not merely as a cost-reduction measure. Third, in every bank and every year the volume of IFRS 9 Stage 3 exposures exceeds the regulatory measure of non-performing loans by a factor of 1.5 to 2.2. Although this gap has narrowed over time, it remains the principal weakness of current risk recognition practice and means that prudential reporting alone provides an incomplete picture of asset quality. Fourth, the proposed effectiveness index permits the differentiation of banks by the maturity of their risk management systems and the identification of specific weaknesses within each institution: Hamkorbank scored 1.262, Ipak Yuli Bank 1.207 and Kapitalbank 1.152 in 2025.

Banks should establish the coverage of automated credit decisions as a formal risk management target rather than an information technology objective, with a minimum threshold of 80 per cent for standardised retail and micro-business products. According to the model estimates, achieving this threshold across the sample would reduce the aggregate non-performing loan ratio by 0.2 to 0.4 percentage points. Institutions expanding into unsecured retail lending should link the growth of that segment

explicitly to the development of their scoring infrastructure. The regression results provide a concrete planning rule: each ten percentage point increase in the unsecured retail share requires approximately a thirty percentage point increase in automation coverage to hold asset quality constant. Internal credit classification should be brought into closer alignment with the expected credit loss framework of IFRS 9. Banks should report both measures in their management accounts and set a target ratio of Stage 3 exposures to regulatory non-performing loans not exceeding 1.3 times, which would materially improve the reliability of internal risk assessment. Collateral coverage should be managed as a portfolio-level parameter with a minimum threshold of 130 per cent for secured segments, and the shortfall in secured coverage created by unsecured lending should be compensated by correspondingly higher provisioning rather than accepted as a structural feature of the business model. The proposed effectiveness index should be calculated quarterly and integrated into the internal risk management framework of banks and into the supervisory toolkit of the Central Bank as an early warning instrument, since it captures deterioration in risk management capability before that deterioration becomes visible in the non-performing loan ratio. The methodological framework proposed in this article can also be applied to the assessment of credit risk management practices in other commercial banks of Uzbekistan, including state-owned institutions undergoing privatisation.

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