

Cost Efficiency and Banking Sector Profitability in Zimbabwe: An ARDL Bounds-Testing Approach, 2015Q1–2024Q4

Mautsa Abigail and Mashava Simbarashe

Department of Economic Sciences, Midlands State University, P Bag 9055, Senga, Gweru, Zimbabwe

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ABSTRACT

This study examines whether cost efficiency is the primary determinant of banking sector profitability in Zimbabwe over 2015Q1–2024Q4, an interval spanning dollarization, the reintroduction of a local currency, the 2020 foreign currency auction system, and the 2024 transition to the Zimbabwe Gold (ZiG). Using quarterly data from the Reserve Bank of Zimbabwe (RBZ) and the Zimbabwe National Statistics Agency (ZIMSTAT), the study applies the Autoregressive Distributed Lag (ARDL) bounds-testing approach of Pesaran and Shin (1997), chosen for its suitability to small samples ($n = 40$) and mixed order of integration. Return on assets (ROA) is modelled as a function of the cost-to-income ratio (CTI) and six further determinants — digital adoption rate (DAR), fee-to-income ratio (FIR), loan-to-deposit ratio (LDR), capital adequacy ratio (CAR), inflation (INF) and non-performing loans (NPL). Bounds testing confirms cointegration ($F = 10.375$, exceeding the 5% upper bound of 3.21). The long-run CTI coefficient is negative and significant (-2.81 , $p < 0.05$): a one percent improvement in cost efficiency raises ROA by 2.81 percent, the largest effect in the model. FIR (-1.45) and NPL (-0.18) are also significant long-run determinants, while DAR, CAR, LDR and INF are not significant at the 5% level over the long run. The error correction term (-2.59 , $p < 0.05$) indicates rapid adjustment toward equilibrium after short-run shocks. Diagnostic tests confirm no serial correlation, homoskedastic and normally distributed residuals, correct functional form, no harmful multicollinearity, and stable parameters. The results support the Efficiency Structure Hypothesis and offer only partial support for the Resource-Based View and Capital Buffer Theory in Zimbabwe's dual-currency, high-inflation setting. To the authors' knowledge, this is the first study to test these three frameworks simultaneously using dynamic econometric methods in Zimbabwean banking, and it closes with regulatory, fiscal and managerial recommendations anchored to the estimated coefficients.

Keywords: cost efficiency; bank profitability; ARDL bounds testing; Zimbabwe; cost-to-income ratio; Efficiency Structure Hypothesis

INTRODUCTION

Bank profitability in Zimbabwe has swung sharply across successive currency regimes, from dollarization in 2009, to the reintroduction of a local currency in 2019, the foreign currency auction system of 2020, and the 2024 introduction of the Zimbabwe Gold (ZiG). Profitability broadly, how much a bank earns relative to what it spends (Lamothe et al., 2024) is closely bound up with operational efficiency, and it is this link, rather than the net interest margins and capital adequacy that conventional banking theory foregrounds, that anchors the present study.

Sound bank management, as the Basel Committee on Banking Supervision (2020) observes, requires not merely adequate capitalisation but governance, regulatory compliance and sustained operational efficiency; in a market with compressed margins, cost management increasingly determines which institutions absorb shocks and which do not (Panayiotis et al., 2008).

The Zimbabwean case is instructive precisely because conventional theory travels badly there. Persistent hyperinflation and exchange-rate volatility have blunted the predictive power of net interest margins and capital ratios (RBZ, 2024; Mudzingwa et al., 2024), leaving operational efficiency as arguably the one lever

banks can adjust regardless of the currency regime in force. Despite a decade of policy intervention, the sector's average return on assets (ROA) has remained close to 8 percent against an average cost-to-income ratio (CTI) of approximately 62 percent a combination that compares unfavourably with regional benchmarks (RBZ, 2024) and points to a structural problem: the effort expended on regulatory compliance and currency reform has not translated into commensurate returns. No published study, to the author's knowledge, has tested whether cost efficiency has displaced the conventional drivers of profitability using dynamic econometric methods over the 2015–2024 period specifically.

This study addresses that gap. Its main objective is to determine empirically whether cost efficiency, proxied by CTI, is the primary driver of banking sector profitability in Zimbabwe between 2015 and 2024. Three specific objectives follow: first, to establish the short-run dynamics and long-run equilibrium relationship between CTI and ROA; second, to assess the relative significance of six further determinants digital adoption rate (DAR), loan-to-deposit ratio (LDR), fee-to-income ratio (FIR), capital adequacy ratio (CAR), inflation (INF) and non-performing loans (NPL); and third, to translate the findings into actionable recommendations for the Reserve Bank of Zimbabwe (RBZ), the Ministry of Finance and Economic Development, bank management, and investors and analysts. Two hypotheses guide the analysis: that cost efficiency has a statistically significant negative effect on profitability, and that at least one of the six additional determinants has a statistically significant effect on profitability.

The study contributes in three respects. Theoretically, it tests for what appears to be the first time simultaneously in the Zimbabwean context, three competing explanations of bank performance: the Efficiency Structure Hypothesis (Demsetz, 1973), the Resource-Based View (Barney, 1991), and Capital Buffer Theory (Berger et al., 1995), against a dual-currency, hyperinflationary environment that none of the three frameworks was originally built to describe. Methodologically, it applies the ARDL bounds-testing approach of Pesaran and Shin (1997), well suited to the mixed order of integration and small sample sizes typical of Zimbabwean quarterly banking data, thereby separating short-run adjustment costs from long-run equilibrium relationships in a way that earlier cross-sectional or panel studies of the sector have not. Practically, the findings are intended to inform four audiences: the RBZ, in calibrating supervisory benchmarks and the timing of currency reform; the Ministry of Finance, in structuring credit and tax policy; bank management, in weighing cost control against revenue diversification; and investors and analysts, in screening Zimbabwean bank stocks.

The remainder of the paper proceeds as follows. Section 2 reviews the theoretical and empirical literature underpinning the three competing frameworks. Section 3 sets out the ARDL model, variable construction and data sources. Section 4 presents descriptive statistics, diagnostic tests and estimation results. Section 5 discusses the findings against the literature, and Section 6 concludes with policy implications, limitations and directions for future research.

LITERATURE REVIEW

Theoretical Framework

Efficiency Structure Hypothesis Demsetz (1973) developed the Efficiency Structure

Hypothesis (ESH) as a direct challenge to the Structure-Conduct-Performance paradigm of Mason (1939) and Bain (1956), which held that market structure determines firm conduct and, in turn, industry profitability. Demsetz inverted this causality: efficient firms lower costs, expand output and capture market share from less efficient rivals, so that concentration is a consequence of efficiency rather than a source of monopoly rents. The resulting profitability gap reflects Ricardian rents accruing to firms with scarce, firm-specific advantages that are costly for rivals to replicate (Ricardo, 1817). The hypothesis has attracted sustained critique: Shepherd's (1982) relative market power hypothesis attributes superior returns to product differentiation and pricing power rather than cost efficiency; Berger (1995) raises the possibility of reverse causality, in which profitable firms invest in efficiency rather than efficiency generating profit; and Hicks's (1935) "quiet life" hypothesis proposes the opposite causal direction entirely, whereby market power breeds managerial complacency and inefficiency. Applied to Zimbabwe, the ESH cuts both ways: currency volatility compresses interest margins and elevates operational efficiency to the one lever banks can reliably adjust, which favours

the hypothesis, but repeated currency reforms also raise local-currency-denominated compliance costs, which could equally erode the efficiency advantage the theory presumes.

Resource-Based View. Barney's (1991) Resource-Based View (RBV) holds that sustained competitive advantage flows from resources that are valuable, rare, inimitable and nonsubstitutable (VRIN). In the present study, digital adoption is treated as the clearest candidate VRIN resource available to Zimbabwean banks, consistent with Wernerfelt (1984) and Penrose (1959) on internally accumulated capability as a driver of firm growth. The RBV's relevance to the ARDL specification lies in its implied time structure: initial investment in digital infrastructure raises costs before capability translates into measurable efficiency gains, a lagged pattern the model is designed to capture. Sanchez (2008) cautions that the RBV under-specifies how resources are converted into performance, a gap this study addresses empirically by estimating the lag length at which digital adoption affects profitability.

Capital Buffer Theory. Berger, Herring and Szego (1995) argue that capital held above regulatory minimums insures banks against unexpected losses, reassures depositors and creditors, and preserves the capacity to fund profitable opportunities through downturns — predicting a positive relationship between capital adequacy and profitability. The theory's applicability to hyperinflationary settings is contested: nominal capital buffers can erode in real terms faster than they are replenished, weakening the buffer's protective effect precisely when it is most needed (Adegboye and Ogunrinola, 2023).

Empirical Literature

Empirical support for the ESH is mixed but leans favourable in emerging-market settings. Nguyen (2024) and Bucevska and Misheva (2017) both report a negative and significant relationship between cost-to-income ratios and profitability consistent with Demsetz's original formulation, while Kapinga and Mwakalasya (2023) find, using a threshold regression on East African data, that the efficiency-profitability relationship holds only below an inflation threshold of roughly 15 percent beyond which efficiency gains fail to translate into returns, a finding directly relevant to Zimbabwe's inflation history.

Evidence on the RBV is more divided. Chipeta and Muthinja (2018) and Abdulazeez (2022) both find that firm-specific resources, including financial innovation and non-traditional income sources, outperform industry-level factors in explaining profitability, while Abdurrahman et al. (2025), studying 355 banking professionals across 51 Indonesian banks, show that digital transformation mediates the relationship between resource endowment and product innovation resource ownership alone is insufficient without organisational capability to deploy it. Tang et al. (2022) reach a similar conclusion for Pakistani banks, where intangible resources embedded in organisational culture, mediated through employee commitment, drive performance. Against this, Muzvidzi, Ncube and Mpofu (2023) find that Zimbabwe's 2020 foreign exchange auction imposed system-reconfiguration costs on banks with no corresponding revenue benefit, and Fortuna and Helmy (2025), examining 126 Indian financial firms, find digitalisation associated with lower financial performance, particularly among smaller firms with limited capacity to exploit digital investment. The RBV therefore commands support for long-run competitive advantage but faces real difficulty translating into near-term profitability in volatile, rapidly regulated environments — precisely the setting an ARDL lag structure is designed to test.

Capital Buffer Theory finds support in Kapinga and Mwakalasya (2023) and Nguyen (2021), both of whom show that well-capitalised banks sustain profitability through periods of extreme volatility, and in Hayati et al. (2026), who find that Tier 1 capital ratios positively predict ROA across 63 Indonesian banks even after controlling for macroeconomic conditions. Harahap (2018) and Mdandalaza and Jeke (2025) reach comparable conclusions for South African banks under Basel III. Countervailing evidence is nonetheless substantial: Adegboye and Ogunrinola (2023) document rapid real capital erosion under hyperinflation, while Setiawan (2021), Rotinsulu et al. (2015) and Osborne et al. (2013) all report statistically insignificant relationships between capital adequacy and ROA. The theory therefore carries theoretical weight but faces genuine implementation difficulty in high-inflation contexts such as Zimbabwe's.

Despite methodological advances supporting ARDL estimation in small, volatile samples, no published study has applied bounds testing to Zimbabwean banking-sector data across the full 2015–2024 window of currency reform and digital acceleration, nor tested the three frameworks above simultaneously. This gap motivates the present study.

METHODOLOGY

Model Specification

The study adopts the Autoregressive Distributed Lag (ARDL) bounds-testing approach developed by Pesaran and Shin (1997), for four reasons. First, the sample of 40 quarterly observations (2015Q1–2024Q4) is small relative to the requirements of alternative cointegration techniques such as Johansen's (1988) approach, which demands larger samples for reliable inference. Second, ARDL accommodates variables of mixed integration order $I(0)$ and $I(1)$ without requiring that all series share the same order, which matters given Zimbabwe's volatile macroeconomic

environment. Third, this mixed-order flexibility eliminates the pretest bias that can arise when unit root tests misclassify a stationary series as non-stationary. Fourth, the ARDL lag structure aligns naturally with the Resource-Based View's implied time lag between digital investment and realised efficiency gains.

The unrestricted error correction representation of the model is specified as:

$$\Delta \ln ROA_t = \alpha_0 + \lambda ECT_{t-1} + \sum \gamma_i \Delta \ln ROA_{t-i} + \sum \sigma_{1j} \Delta \ln CTI_{t-j} + \sum \sigma_{2j} \Delta \ln FIR_{t-j} + \sum \sigma_{3j} \Delta \ln LDR_{t-j} + \sum \sigma_{4j} \Delta \ln CAR_{t-j} + \sum \sigma_{5j} \Delta \ln DAR_{t-j} + \sum \sigma_{6j} \Delta \ln INF_{t-j} + \sum \sigma_{7j} \Delta \ln NPL_{t-j} + \varepsilon_t$$

where Δ is the first-difference operator, $\ln$ denotes natural logarithm (so that coefficients approximate elasticities), ECT_{t-1} is the error correction term whose coefficient λ captures the speed of adjustment toward long-run equilibrium (expected to be negative and significant), and ε_t is a white-noise error term. Inflation (INF) enters in raw level form because the series contains negative values, making log transformation mathematically invalid.

Variable Definitions and Data

The dependent variable, return on assets (ROA), is measured as net income divided by total assets. The primary explanatory variable, the cost-to-income ratio (CTI), is measured as operating expenses divided by operating income and is expected to carry a negative sign. Six further determinants are included: digital adoption rate (DAR), the value of digital transactions as a share of total transaction value (expected positive); fee-to-income ratio (FIR), non-interest income as a share of total income (expected positive); loan-to-deposit ratio (LDR)

Total loans divided by total deposits (sign ambiguous); capital adequacy ratio (CAR), Tier 1 plus Tier 2 capital divided by risk-weighted assets (expected positive); inflation (INF), the quarterly percentage change in the consumer price index (expected negative); and non-performing loans (NPL), non-performing loans as a share of total credit (expected negative).

Table 1. Variable definitions, expected signs and data sources

Variable	Symbol	Measurement	Expected sign	Source
Return on Assets	ROA	Net income / Total assets	Dependent	RBZ
Cost-to-income ratio	CTI	Operating expenses / Operating income	Negative	RBZ
Digital adoption rate	DAR	Digital transaction value / Total transaction value	Positive	RBZ

Fee-to-income ratio	FIR	Non-interest income / Total income	Positive	RBZ
Loan-to-deposit ratio	LDR	Total loans / Total deposits	Positive or negative	RBZ
Capital adequacy ratio	CAR	(Tier 1 + Tier 2 capital) / Riskweighted assets	Positive	RBZ
Inflation rate	INF	Quarterly CPI percentage change	Negative	ZIMSTAT
Non-performing loans	NPL	Non-performing loans / Total credit	Negative	RBZ

Source: Author's compilation.

All data are quarterly and secondary, drawn from RBZ bank-sector reports and ZIMSTAT price statistics for 2015Q1–2024Q4 (40 observations). Individual bank-level data are unavailable owing to confidentiality restrictions, so the analysis is conducted at the aggregate sector level, encompassing commercial banks, building societies and the savings bank regulated directly by the RBZ. Where minor gaps occur in the inflation series (at most two of forty observations, or 5 percent), linear interpolation preserves quarterly continuity; no other series required interpolation.

Estimation Procedure and Diagnostic Tests

Estimation proceeds in four steps using E-Views 13. First, Augmented Dickey-Fuller (ADF) unit root tests establish the order of integration of each series and confirm that none is integrated of order two, a precondition for valid ARDL bounds testing. Second, VAR lag-order selection criteria (LR, FPE, AIC, SC, HQ) determine the optimal lag length. Third, the bounds test evaluates the joint null hypothesis of no cointegration by comparing the computed F-statistic against the critical value bounds of Pesaran, Shin and Smith (2001). Fourth, conditional on cointegration, the longrun and error-correction (short-run) coefficients are estimated and subjected to a battery of diagnostic checks: the Breusch-Godfrey LM test for serial correlation, the Breusch-Pagan-Godfrey test for heteroskedasticity, the Jarque-Bera test for normality of residuals, the Ramsey RESET test for functional form, the CUSUM and CUSUMSQ tests of Brown, Durbin and Evans (1975) for parameter stability, and a Pearson pairwise correlation matrix to screen for harmful multicollinearity among regressors.

RESULTS

Descriptive Statistics

Over 2015Q1–2024Q4, ROA averaged 8 percent with a maximum of 26.1 percent and a minimum of 0.08 percent. The unusually high maximum warrants a measurement caveat: Sub-Saharan African bank ROA typically ranges between 1 and 4 percent (IMF, 2024), so a reading of 26.1 percent likely reflects nominal distortion during the 2019–2022 dual-currency period, when local currency income figures were inflated by rapid depreciation while asset bases remained partly USD- denominated an accounting artefact documented elsewhere in hyperinflationary economies (Adegboye and Ogunrinola, 2023). CTI averaged 63 percent, ranging from 38 percent in the most efficient quarters to 97.6 percent under acute stress, consistent with the high operational costs that motivate this study. NPL averaged 5 percent, LDR 52 percent (indicating conservative lending relative to deposits), FIR 30 percent, CAR 33 percent (well above the 12 percent regulatory minimum, consistent with Capital Buffer Theory), and quarterly inflation growth averaged 2.4 percent with high volatility (std. dev. 4.8 percentage points). Jarque-Bera tests indicate non-normal distributions for ROA, CAR and inflation ($p < 0.05$), justifying the log transformation applied to non-inflation variables prior to estimation.

Unit Root and Cointegration Tests

ADF tests confirm a mixed order of integration consistent with the ARDL requirement that no series be integrated of order two. Inflation and digital adoption growth are stationary in levels, $I(0)$ (ADF statistics of -5.35 and -4.70 respectively, both $p < 0.01$), while ROA, NPL, LDR, FIR, CTI and CAR are non-stationary

in levels but become stationary after first differencing, $I(1)$ (ADF statistics ranging from -4.02 to -13.42 , all $p < 0.01$). VAR lag-order selection criteria unanimously select three lags (three quarters) as optimal, a horizon consistent with the Resource-Based View's expectation that digital-investment effects take time to materialise.

The bounds test yields an F-statistic of 10.375, which exceeds the upper bound critical value of 3.21 at the 5 percent level of significance (and the 1 percent bound of 3.90). The null hypothesis of no cointegration is therefore rejected, confirming a stable long-run equilibrium relationship between banking sector profitability and its determinants, and satisfying the first specific objective of the study.

Long-Run and Short-Run Estimates

Table 2. ARDL long-run coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCTI(-1)	-2.81	0.54	-5.19	0.00
LNFIR(-1)	-1.45	0.28	-5.18	0.00
LNNPL(-1)	-0.18	0.07	-2.50	0.02
LNDAR(-1)	-0.39	0.23	-1.71	0.097
LNLDR(-1)	-0.49	0.32	-1.55	0.13
LNCAR(-1)	-0.11	0.58	-0.18	0.86
INF(-1)	1.07	1.06	1.01	0.32
Constant	-7.51	1.35	-5.58	0.00

Source: Author's ARDL model computations, EViews 13.

Cost efficiency (LNCTI) carries the largest and most significant long-run coefficient in the model:

-2.81 ($p < 0.01$), meaning a 1 percent reduction in the cost-to-income ratio raises ROA by 2.81 percent in the long run — more than double the magnitude of the next largest effect. Fee-to-income ratio (-1.45 , $p < 0.01$) and non-performing loans (-0.18 , $p = 0.02$) are also significant long-run determinants. Digital adoption approaches but does not clear the 5 percent significance threshold ($p = 0.097$), while loan-to-deposit ratio, capital adequacy ratio and inflation are statistically insignificant in the long run.

The error correction term is negative and highly significant ($\text{CointEq}(-1) = -2.59$, $p < 0.01$), confirming rapid adjustment back toward long-run equilibrium following a shock — consistent with a macroeconomic environment in which currency reforms trigger abrupt corrections rather than gradual drift. The short-run dynamics reveal a distinctive pattern for cost efficiency: the contemporaneous CTI coefficient is negative (-1.39 , $p < 0.01$), but the first- and second-lag coefficients turn positive and large (4.56 and 3.18 respectively, both $p < 0.01$), consistent with Barney's (1991) expectation that efficiency investments raise costs immediately before generating returns over subsequent quarters. Digital adoption shows a mirrored pattern: a significant positive short-run effect (0.71, $p < 0.05$) that reverses to an insignificant negative long-run effect, suggesting that the costs of sustaining digital infrastructure system maintenance, training, upgrades gradually offset the initial efficiency gain. Capital adequacy is positive and significant in the short run (rising to 2.11 after two lags) but statistically indistinguishable from zero in the long run. The full model explains variation in ROA closely ($R^2 = 0.994$, adjusted $R^2 = 0.985$, $F = 111.81$, $p < 0.01$; Durbin-Watson = 2.51).

Diagnostic Tests

Table 3. Model diagnostic tests

Test	Statistic	p-value	Conclusion
Breusch-Godfrey (serial correlation)	$F = 1.70$	0.39	No serial correlation
Breusch-Pagan-Godfrey (heteroskedasticity)	$F = 0.30$	0.96	Homoskedastic

Jarque-Bera (normality)	JB = 0.72	0.70	Normal residuals
Ramsey RESET (functional form)	F = 0.004	0.95	Correctly specified
Test	Statistic	p-value	Conclusion
CUSUM / CUSUMSQ (stability)	—	—	Parameters stable
Pearson correlation (multicollinearity)	max $r = -0.77$ (CAR, CTI)	—	No harmful multicollinearity

Source: Author's computations, EViews 13.

All diagnostics support the reliability of the estimated model. Residuals show no serial correlation, are homoskedastic and normally distributed, and the model passes the RESET test for correct functional form. The CUSUM and CUSUMSQ statistics remain within the 5 percent critical bounds throughout the sample, indicating stable parameters despite the structural breaks associated with the 2019 currency reform, the 2020 foreign currency auction, COVID-19, and the 2024 ZiG transition. The highest pairwise correlation among regressors (-0.77 , between CAR and CTI) remains below the conventional 0.80 threshold, confirming that the CTI coefficient is not an artefact of variance inflation.

DISCUSSION

The results speak directly to the study's central question. The long-run CTI coefficient of -2.81 confirms cost efficiency as the primary driver of banking sector profitability in Zimbabwe over 2015–2024, in line with the Efficiency Structure Hypothesis (Demsetz, 1973) and consistent with Nguyen (2024) and Bucevska and Misheva (2017), who report comparable negative relationships in other emerging markets. The magnitude of the effect — nearly double that of the next-largest determinant, fee-to-income ratio — suggests that cost efficiency has, in effect, displaced the net interest margin and capital adequacy channels that conventional theory foregrounds, a displacement plausibly driven by the margin compression that hyperinflation and currency instability impose on interest-based income. The insignificant long-run coefficient on inflation ($p = 0.32$) is also informative here: it is consistent with Kapinga and Mwakalasya's (2023) threshold finding that efficiency effects weaken once inflation crosses a critical level, implying that Zimbabwean banks' efficiency gains may take longer to crystallise into profitability than the sample's lag structure alone can capture.

Digital adoption's mixed result — a significant short-run gain followed by an insignificant long-run effect — lends qualified support to the Resource-Based View. The pattern is consistent with Muzvidzi et al.'s (2023) finding that Zimbabwe's system reconfigurations after currency reform generated cost burdens that outpaced revenue benefits, and it echoes Fortuna and Helmy's (2025) broader finding that digitalisation does not translate automatically into profitability. Read alongside Barney's (1991) resource-based logic, the short-run gain represents the immediate productivity benefit of new digital channels, while the fading long-run effect reflects the ongoing maintenance, training and upgrade costs that erode that benefit after roughly three to four quarters.

Capital Buffer Theory receives support only in the short run. Positive and significant short-run coefficients on capital adequacy are consistent with Kapinga and Mwakalasya (2023) and Nguyen (2021), who find that capital buffers support profitability during periods of acute stress; but the insignificant long-run coefficient ($p = 0.86$) aligns instead with Setiawan (2021), who reports no long-run relationship between capital adequacy and ROA. A plausible reconciliation is that capital held well above the regulatory minimum averaging 33 percent against a 12 percent floor constrains the volume of loans and other income-generating assets banks can profitably deploy over time, offsetting the buffer's protective value once the immediate shock has passed.

Fee income and credit risk both behave as conventional theory predicts, though with a Zimbabwe-specific texture. The negative long-run FIR coefficient (-1.45) suggests that, rather than diversifying revenue as fee income theory generally assumes (see Faster Capital, 2025), rising fees in Zimbabwe's dual-currency environment push transaction volume toward informal channels and mobile money operators, eroding rather than supporting profitability. Non-performing loans show the expected short-run/long-run reversal: an immediate positive coefficient, as banks defer loss recognition, followed by a negative long-run effect once

provisions and write-offs are eventually taken — a pattern broadly consistent with credit risk theory and with the loan-to-deposit ratio's persistently negative coefficients, which together suggest that aggressive lending in Zimbabwe's environment elevates risk without a compensating profitability return.

CONCLUSION AND POLICY IMPLICATIONS

This study set out to determine whether cost efficiency is the primary driver of banking sector profitability in Zimbabwe over 2015–2024. The evidence supports that conclusion unambiguously: the long-run CTI coefficient of -2.81 ($p < 0.01$) is the largest and most significant in the model, confirming the Efficiency Structure Hypothesis and satisfying the study's main objective. Cointegration is well established ($F = 10.375$ against an upper bound of 3.21), and the error correction term (-2.59 , $p < 0.01$) confirms rapid short-run adjustment toward long-run equilibrium, jointly satisfying the first specific objective. Fee-to-income ratio and non-performing loans are significant secondary long-run determinants, while digital adoption, capital adequacy, inflation and loan-to-deposit ratio are not significant at the 5 percent level in the long run, satisfying the second specific objective. A full diagnostic battery confirms the model is correctly specified, its residuals well behaved, and its parameters stable across four structural breaks in the sample period.

These findings translate into four sets of recommendations, addressed to the study's third specific objective.

For the Reserve Bank of Zimbabwe: establish an explicit CTI benchmark a target of 50 percent is suggested as a supervisory pillar distinct from capital adequacy, since a bank can appear well capitalised while remaining operationally inefficient; announce currency-reform timelines with at least twelve months' notice to reduce the system-reconfiguration costs that compress short-run profitability after each transition; and extend targeted capital relief (on the order of 1–2 percent of CAR) to banks investing in core banking upgrades, AI-assisted credit scoring and blockchainbased payment infrastructure, timed to the three-to-four-quarter horizon over which this study finds digital returns to materialise and then fade.

For the Ministry of Finance and Economic Development: revisit the Domestic Minimum TopUp Tax on foreign-controlled banks, whose gross-profit basis raises the cost of leverage and constrains lending capacity (Sobiech et al., 2021; Ernst & Young, 2024); pursue macroeconomic stabilisation, given that a 1 percent inflation shock is associated with a 7.28 percent short-run profitability decline; and broaden credit guarantee schemes for small and medium enterprises, since the loan-to-deposit ratio's persistently negative coefficient indicates that aggressive lending into Zimbabwe's largely informal economy currently elevates risk without a matching profitability return.

For bank management: prioritise cost control over revenue expansion — the CTI coefficient is roughly double the magnitude of the next largest determinant, meaning a 10 percent reduction in CTI raises ROA by an estimated 28 percent, against a comparable increase in fee income that reduces ROA by roughly 14.5 percent; treat digital investment as a recurring three-to-four-quarter budget cycle requiring continuous reinvestment rather than a one-off cost; and design fee structures around multi-product relationships and digital-channel discounts rather than blanket increases, which the evidence suggests drive customers toward informal and mobile-money alternatives.

For investors and analysts: weight CTI ahead of capital adequacy when screening Zimbabwean bank stocks, since CAR carries no significant long-run predictive value in this sample; treat fee-to-income ratio as a risk indicator rather than a diversification signal; and time entry and exit around banks' digital reinvestment cycles, given the three-to-four-quarter horizon over which digital returns to profitability reverse absent renewed investment.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

Four limitations qualify these conclusions. The analysis relies on aggregated sector-level data because individual bank data are confidential, which may obscure meaningful heterogeneity across institutions; CTI captures only X-efficiency and not scale or profit efficiency, for which Data Envelopment Analysis or Stochastic Frontier Analysis would be better suited; the findings are specific to Zimbabwe's dual-currency,

high-inflation environment and should not be generalised to more stable economies; and ratios reported in US dollar terms may be sensitive to exchangerate movements beyond the sample period. Future research should pursue bank-level panel analysis where data access permits, extend the digital-adoption lag structure to six or eight quarters to test whether returns eventually stabilise, apply efficiency-decomposition methods such as DEA or SFA, and extend the sample into the post-ZiG period to assess whether currency stabilisation strengthens the efficiency-profitability relationship this study identifies.

In sum, the study contributes what is, to the author's knowledge, the first simultaneous empirical test of the Efficiency Structure Hypothesis, the Resource-Based View and Capital Buffer Theory in Zimbabwe's banking sector using dynamic ARDL methods, and it offers a coefficient-anchored set of recommendations for regulators, fiscal authorities, bank management and investors navigating one of the more volatile banking environments in the region.

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