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Research Article

Credit risk and the financial performance of banks: evidence from commercial banks in Ghana

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Abstract

This study examines the relationship between credit risk indicators capital adequacy ratio (CAR), non-performing loans ratio (NPL), and loans-to-assets ratio (LAR) and the financial performance of commercial banks in Ghana, measured through return on assets (ROA) and return on equity (ROE). Utilizing balanced panel data from audited financial reports of fourteen commercial banks spanning 2010 to 2022, the research employs multiple least squares regression analysis to investigate these relationships. The empirical findings reveal that CAR and LAR demonstrate statistically significant positive associations with both ROA and ROE, suggesting that higher capital adequacy and loan portfolio expansion contribute favourably to bank profitability. Conversely, the NPL ratio exhibits a significant negative relationship with financial performance, indicating that deteriorating asset quality substantially undermines bank profitability. These results underscore the critical importance of prudent credit risk management in sustaining financial performance. The study recommends that bank management prioritise effective monitoring of risk-weighted assets to maintain optimal capital adequacy levels, while simultaneously strengthening credit appraisal mechanisms and loan monitoring frameworks to mitigate non-performing loans. Such measures are essential for preserving both operational performance and regulatory capital requirements in Ghana's banking sector.

Keywords: *Credit risk; financial performance; Commercial banks; Ghana*

1 Introduction

The banking sector occupies a pivotal position in contemporary economic systems, serving as the primary catalyst for economic growth and development across both developed and emerging economies (Barra & Ruggiero, 2023). This centrality stems from banks' fundamental role in facilitating the efficient allocation of capital within an economy, thereby ensuring the optimal circulation of financial resources among various economic agents. Banks perform this critical intermediation function by mobilizing surplus funds from households, corporations, and government entities, subsequently channeling these resources to deficit sectors through loans and advances designated for productive activities and capital investments (Bhatt et al., 2023; Isenberg et al., 2022). This

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intermediation process generates substantial economic value, as access to credit enables both producers and consumers to expand their economic activities, consequently contributing to enhanced gross domestic product (GDP) growth (Babatunde et al., 2024). However, the execution of this vital intermediation function exposes banks to multifaceted risks that threaten their operational sustainability and financial stability (Akomeah et al., 2020).

Risk constitutes an inherent element of banking operations, manifesting across various dimensions of financial intermediation activities. While risk-taking represents an essential component of entrepreneurial and financial decision-making, the absence of appropriate risk mitigation strategies can precipitate severe financial distress, particularly within the banking sector where leverage amplifies the consequences of adverse outcomes (Akomeah et al., 2020). The banking literature identifies several categories of risks confronting financial institutions, including interest rate risk, liquidity risk, operational risk, market risk, regulatory risk, and credit risk (Natufe & Evbayiro-Osagie, 2023). Among these risk categories, credit risk defined as the potential loss arising from a borrower's failure to fulfil contractual obligations has emerged as the predominant threat to banking sector stability, particularly in developing economies (Natufe & Evbayiro-Osagie, 2023; Barra & Ruggiero, 2023).

Credit risk encompasses the probability that a bank will experience deterioration in asset quality due to borrowers' inability or unwillingness to meet their repayment obligations according to agreed contractual terms (Shahid et al., 2019; Temba et al., 2024). This risk manifests most visibly through non-performing loans (NPLs), which represent credit exposures that have ceased generating income for the lending institution. The accumulation of NPLs erodes both the profitability and capital adequacy of banks, creating a vicious cycle wherein impaired assets constrain lending capacity, thereby diminishing future revenue generation potential (Topyan et al., 2024). Mian and Santos (2018) demonstrate that inadequate credit risk management practices, often characterized by lax lending standards and insufficient monitoring mechanisms, systematically undermine the effectiveness of credit risk frameworks, ultimately precipitating banking crises and institutional failures. Consequently, the relationship between credit risk management and financial performance has become a critical area of inquiry for banking scholars, regulators, and practitioners alike.

The Ghanaian banking sector provides a particularly compelling context for examining credit risk dynamics and their implications for financial performance. The sector has experienced significant turbulence over the past decade, characterized by multiple bank failures attributable primarily to deficiencies in credit risk management practices (Akomeah et al., 2020). Between 2017 and 2019, the Bank of Ghana undertook extensive reforms that resulted in the revocation of licenses for several financial institutions, including UT Bank, Capital Bank, UniBank, Royal Bank, Beige Bank, Sovereign Bank, Construction Bank, Bank for Housing and Construction, and several others all of which collapsed primarily due to inadequate management of credit risk, particularly the proliferation of non-performing loans (Akomeah et al., 2020; Dunyoh et al., 2022). These institutional failures generated substantial economic and social costs, including the displacement of thousands of employees, erosion of depositor confidence, and losses amounting to billions of Ghanaian cedis for stakeholders. The fundamental cause underlying these failures was identified as poor credit appraisal processes and inadequate loan monitoring systems, which permitted the accumulation of impaired assets that eventually, overwhelmed the affected institutions' capital buffers (Dunyoh et al., 2022; Boateng, 2019).

The international evidence base consistently demonstrates significant associations between credit risk indicators and banking sector performance across diverse geographical contexts. Studies conducted in developed markets, including the United States, United Arab Emirates, and European countries, have established that credit risk metrics particularly capital adequacy ratio (CAR), non-performing loan ratio (NPL), and loans-to-assets ratio (LAR) exert substantial influence on bank profitability measures such as return on assets (ROA) and return on equity (ROE) (Topyan et al., 2024; Al Zaidanin & Al Zaidanin, 2021; Ekinci & Poyraz, 2019). Similarly, research from developing economies in Africa, Asia, and the Middle East corroborates these findings, demonstrating that effective credit risk management constitutes a critical determinant of sustainable banking sector performance (Shahid et al., 2019; Babatunde et al., 2024; Oritsegbubemi & Evbayiro-Osagie, 2023). For instance, Oritsegbubemi and Evbayiro-Osagie (2023) documented strong correlations between credit risk met-

rics and financial performance among Nigerian deposit money banks, while Babatunde et al. (2024) identified similar relationships in the South African banking context. These empirical findings underscore the universal importance of prudent credit risk management in sustaining banking sector health and performance.

Despite the extensive international literature examining credit risk-performance relationships, significant research gaps persist within the Ghanaian context, creating an imperative for additional empirical investigation. First, while several studies have examined credit risk dynamics in Ghana's banking sector, these investigations predominantly employed data collected prior to two transformative events: the comprehensive banking sector reforms initiated by the Bank of Ghana in 2019 and the COVID-19 pandemic that commenced in 2020. For example, Dunyoh et al. (2022) analyzed ten rural banks covering the period 2014-2018, while Akomeah et al. (2020) examined ten listed commercial banks from 2007-2016, and Boateng (2019) investigated ten listed banks from 2011-2017. Similarly, Kwashie et al. (2022) studied fifteen commercial banks but limited their analysis to 2013-2018. Consequently, the existing literature fails to capture the impact of significant regulatory changes introduced through the implementation of Basel I and II Pillar I requirements, which emphasize enhanced risk management frameworks and performance optimization strategies. Furthermore, these studies do not reflect the profound disruptions occasioned by the COVID-19 pandemic, which fundamentally altered credit dynamics, asset quality, and banking sector performance across global markets.

Second, the existing empirical evidence from Ghana exhibits considerable inconsistency regarding the direction and magnitude of relationships between credit risk indicators and financial performance measures. With respect to capital adequacy ratio, some studies (Kwashie et al., 2022; Dunyoh et al., 2022; Akomeah et al., 2020; Nsiah et al., 2019) report positive associations with profitability, while others document inverse relationships (Boateng, 2019; Annor & Obeng, 2017). Similarly, although the majority of investigations (Kwashie et al., 2022; Dunyoh et al., 2022; Akomeah et al., 2020; Nsiah et al., 2019; Annor & Obeng, 2017) identify negative correlations between non-performing loan ratios and financial performance, contradictory findings have also been reported (Boateng, 2019; Chaudron, 2018). Furthermore, regarding the loans-to-assets ratio, divergent results emerge, with some researchers (Boateng, 2019; Chaudron, 2018; Annor & Obeng, 2017) documenting negative relationships with performance while others (Kwashie et al., 2022) report opposite findings. These inconsistencies suggest potential issues related to sample composition, temporal coverage, methodological approaches, or variable operationalization, thereby necessitating additional empirical work to establish more definitive conclusions. Third, previous studies have employed diverse combinations of credit risk proxies and performance indicators, limiting comparability across investigations and obscuring the specific mechanisms through which different risk dimensions influence bank profitability. Some researchers utilized variables such as investment capacity ratios, deposits-to-assets ratios, and loan loss provisions alongside more conventional metrics, resulting in heterogeneous analytical frameworks that complicate synthesis of findings and development of coherent theoretical understanding.

The present study addresses these critical gaps through several methodological and empirical contributions. First, it extends the temporal coverage of analysis through 2022, thereby capturing the effects of both the 2019 banking sector reforms and the COVID-19 pandemic on credit risk-performance dynamics. This extended timeframe permits examination of how regulatory changes and macroeconomic shocks have influenced the relationship between credit risk management and financial performance in Ghana's restructured banking landscape. Second, the study employs a larger and more representative sample comprising fourteen commercial banks including both listed and unlisted institutions thereby enhancing the generalizability of findings across Ghana's diverse banking sector. Third, by focusing specifically on three widely recognized credit risk indicators (capital adequacy ratio, non-performing loan ratio, and loans-to-assets ratio) and two standard performance measures (return on assets and return on equity), the study provides a parsimonious yet comprehensive analytical framework that facilitates comparison with international evidence while addressing the specific context of Ghana's post-reform banking environment. Through these contributions, this investigation seeks to provide definitive empirical evidence regarding credit risk-performance relationships in Ghana, offering actionable insights for bank management, regulatory authorities, and policymakers concerned with sustaining financial sector stability and performance.

2 Theoretical and Empirical Review

2.1 An Integrative Theoretical Lens

Interrogating the nexus between credit risk and bank performance requires a theoretical lens that is at once monetary, prudential, and organisational. This study adopts an integrative framework that weaves together the credit theory of money, modern credit risk theory, and agency theory. The first anchors banking in a web of contractual promises and institutionalised obligations; the second equips us with analytical tools for identifying, pricing, and managing exposure; the third explains why incentives and information frictions within and around banks condition how risks are actually taken and governed. Viewed jointly, these perspectives imply that profitability is an emergent property of three interacting systems: the monetary-credit system that creates claims, the risk system that prices and hedges them, and the governance system that disciplines decision-makers. This triad motivates the empirical strategy of linking asset quality, capital strength, and intermediation intensity to ROA and ROE, while recognising that scale, age, leverage, and institutional design shape the realised mapping from risk to return.

2.2 Component Theories

2.2.1 Credit Theory of Money

The credit theory of money locates the essence of banking in the creation and management of debt relations. Rather than treating money as a commodity, it emphasises money's nature as a record of obligations that binds creditors and debtors in time (Coghlan, 2014; Wray, 2014). Loans are thus simultaneously assets for banks and obligations to recognise borrowers' claims on liquidity and to release them upon performance. Because credit is relational, risk is not simply a statistical frequency of default; it is a manifestation of stresses in the network of obligations, contract enforcement, and institutional trust (Hanappi, 2013). This perspective foregrounds the quality of creditor–debtor relationships, legal infrastructures, and reputation, all of which leave fingerprints on non-performing loans, provisions, and ultimately profitability.

2.2.2 Credit Risk Theory

Credit risk theory provides the machinery for measuring and managing exposure. Qualitative approaches credit grading and expert judgment marshal tacit knowledge about management quality, industry position, and project viability, but invite inconsistency and bias (Niklis et al., 2018). Quantitative approaches from logistic default models to structural and reduced-form intensity models offer consistency, scalability, and portfolio aggregation, at the cost of specification risk and sensitivity to regime shifts. A mature risk function integrates both perspectives within a lifecycle architecture spanning identification, measurement, pricing, approval, monitoring, and workout (Neuberg & Glasserman, 2019). Central to this architecture is the principle of risk-adjusted return: the objective is not to minimise risk per se, but to eliminate uncompensated risk and accept priced risk that lifts the ratio of return to capital consumed. Accordingly, observed links between risk indicators and performance are expected to be non-linear and context dependent; moderate, well-priced risk may enhance ROA and ROE, while poorly underwritten or concentrated risk destroys value.

2.2.3 Agency Theory

Agency theory illuminates how incentive misalignment and information asymmetry shape credit outcomes. Depositors and shareholders (principals) delegate authority to managers (agents) who in turn delegate to loan officers and interact with borrowers creating nested principal–agent chains (Brinkerhoff & Bossert, 2013). Moral hazard arises ex ante, if screening is lax or origination targets trump quality, and ex post, if borrowers take hidden actions or under-invest in projects (Kistruck et al., 2013; Salehyan et al., 2014). Compensation structures

that reward volume or short-term income, weak monitoring, and limited board oversight raise the probability that risk is mispriced and poorly managed (Isenberg et al., 2022). Contemporary prudential standards therefore emphasise governance independent risk committees, clear risk appetite statements, and accountability as complements to technical models (Basel Committee, 2016). For empirical work this implies that balance-sheet indicators such as NPL ratios, capital adequacy, and leverage encapsulate not only market conditions but also the quality of governance.

2.3 Empirical Review (Thematic Synthesis)

The empirical literature on credit risk and bank performance is vast but heterogeneous. Rather than listing country cases, this review organises the evidence around themes that directly inform the present study: the asset-quality–performance nexus; capital strength and solvency buffers; intermediation intensity and portfolio mix; structural features such as size and age; funding structure and leverage; governance and risk management quality; and the role of contextual moderators. Throughout, we reconcile ostensibly conflicting findings by attending to measurement choices, market structure, and regulatory regimes, thereby letting the literature speak to the Ghanaian post-reform setting.

2.3.1 Asset Quality and Performance

Across jurisdictions, non-performing loans (NPLs) bear a robust inverse relationship to profitability. Studies for Turkey (Ekinci & Poyraz, 2019), Jordan (Ghaith & Bani-Khalid, 2019), the United States and Europe (Isenberg et al., 2022; Topyan et al., 2024) consistently report negative effects of NPLs on ROA and ROE, reflecting provisioning costs, lost interest income, and managerial distraction. In Sub-Saharan Africa, evidence tends in the same direction even where statistical precision varies: Nigerian analyses often find NPLs to be a significant drag on ROE (Oritsegbubemi & Evbayiro-Osagie, 2023), while South African samples report negative but sometimes insignificant coefficients, plausibly due to better risk systems and more diversified income (Babatunde et al., 2024). Within Ghana, longer-horizon studies pre-cleanup show clear penalties from impaired assets (Akomeah et al., 2020), whereas some smaller-sample or narrower-window studies register weaker or even anomalous signs (Annor & Obeng, 2017), likely due to measurement noise, sample selection, or omitted governance variables. Taken together, the preponderance of evidence supports the expectation applied here: improving asset quality is first-order for profitability, with equity returns more sensitive than asset returns owing to the residual nature of equity claims.

2.3.2 Capital Adequacy and Performance

The relation between solvency buffers and performance is more context dependent. In developed and financially deep markets, capital adequacy typically correlates positively with ROA and ROE, consistent with lower funding premia, better credit ratings, and greater strategic flexibility (Al Zaidanin & Al Zaidanin, 2021; Isenberg et al., 2022). Several Ghanaian and Nigerian studies also find positive associations (Akomeah et al., 2020; Nsiah et al., 2019), indicating that well-capitalised banks are better positioned to intermediate profitably. Yet other work reports insignificant or even negative links (Boateng, 2019; Yousuf & Felfoldi, 2018; Oritsegbubemi & Evbayiro-Osagie, 2023). Two mechanisms reconcile this divergence. First, during tightening cycles or when risk-weighted assets are re-priced conservatively, higher capital may coincide with deleveraging and margin compression, lowering contemporaneous profitability. Second, when lending opportunities are scarce or competition intense, binding capital constraints can curb risk-adjusted growth. Post-reform Ghana with stronger buffers, consolidation, and recapitalisation provides a setting where the positive, stability-enhancing channel is expected to dominate, as our findings later confirm.

2.3.3 Intermediation Intensity and Portfolio Mix

Loans-to-assets (or loans-to-deposits) ratios proxy the extent to which banks commit balance sheets to credit intermediation. The literature is ambivalent because the profitability effect is conditional on pricing power, asset quality, and liquidity risk. Where underwriting and pricing are robust, higher loan shares lift ROA via net interest margins; where screening is weak or competition compresses spreads, expanding loans can dilute returns. South African and Pakistani evidence often finds negative or insignificant effects (Babatunde et al., 2024; Shahid et al., 2019), consistent with competitive pressure and capital-liquidity constraints. Kenyan equity market studies respond primarily to NPL dynamics rather than loan ratios (Oketch et al., 2018), implying that investors reward quality signals over quantity metrics. Ghanaian results are similarly mixed, with some samples suggesting gains to measured expansion and others revealing no clear link. The present study's split finding LTAR supporting ROA but not ROE accords with this logic: intermediation volume can raise asset-level profitability without necessarily enhancing shareholder returns once capital structure and risk are priced in.

2.3.4 Structural Features: Size, Age, and Efficiency

Scale and institutional maturity carry opposing empirical signals. Larger balance sheets can, in principle, exploit economies of scale and scope; yet many studies document diminishing returns or diseconomies when expansion outpaces risk-adjusted opportunities or operational discipline. Evidence for Ghana and several developing markets finds size negatively associated with ROA/ROE at the margin, while bank age capturing informational capital, reputation, and relationship banking advantages tends to support profitability. This pattern is coherent with agency theory: older institutions may have better-honed screening and monitoring capabilities, whereas rapid asset growth can strain governance and systems, elevating latent risk and costs.

2.3.5 Funding Structure and Leverage

Leverage occupies a delicate position in banking. Textbook logic notes that, for a given ROA, higher leverage amplifies ROE; yet empirical studies in emerging contexts frequently observe the opposite once risk and funding conditions are accounted for. Where liability structures are fragile, wholesale funding expensive, and earnings volatile, higher leverage magnifies downside risk and compresses equity returns precisely what our Ghanaian evidence displays. By contrast, in deep markets with reliable access to stable funding, leverage may be neutral or mildly positive for ROE, provided risk is tightly managed. This underscores a central implication: capital quality and funding resilience, not mechanical leverage, determine whether intermediation can translate into durable shareholder value.

2.3.6 Governance Quality and Risk Management Capability

A growing strand distinguishes the level of risk from the quality of risk management. Jordanian studies illustrate the point: measures of risk exposure (NPLs, doubtful loans) correlate negatively with performance (Ghaith & Bani-Khalid, 2019), while measures of risk management quality correlate positively (Alshatti, 2015). This accords with agency-theoretic predictions and Basel guidance: governance architectures independent risk committees, risk appetite frameworks, remuneration discipline mediate how much of observed risk is compensated and how quickly problems are resolved. In African settings, improvements in credit registries, collateral registries, and data infrastructure further shift the mapping from risk to return by reducing adverse selection and enhancing recoveries.

2.3.7 Contextual Moderators: Market Depth, Regulation, and Shocks

Differences between developed and developing markets often reflect contextual moderators. Developed-market studies typically report strong, theoretically consistent results negative NPL effects and positive capital effects supported by large samples, homogeneous regulation, and sophisticated risk systems (Isenberg et al., 2022;

Topyan et al., 2024). Developing-market findings can be noisier, with capital sometimes appearing to constrain growth when viable lending opportunities are scarce or when regulatory recalibration reduces measured risk appetite. Shocks matter too: during clean-ups and post-crisis periods, transitional dynamics asset write-downs, recapitalisation, and portfolio rebalancing temporarily alter profitability metrics even as long-term resilience improves. For Ghana, the 2017–2019 consolidation and subsequent COVID-19 period created exactly such dynamics, strengthening capital and governance yet interacting with macro cycles to shape measured ROA and ROE.

2.4 Critical Synthesis and Implications for the Present Study

The theoretical triad and the thematic evidence converge on a clear narrative. Asset quality is the fulcrum: where underwriting, monitoring, and recovery are effective, profitability is preserved; where they falter, both ROA and ROE deteriorate, with equity absorbing the sharper blow. Capital is performance-enhancing when it reduces funding premia, stabilises earnings, and enables patient intermediation; it appears performance-constraining only when measured contemporaneously during deleveraging or where opportunity sets are thin. Intermediation intensity raises ROA where spreads compensate for risk and liquidity is well managed, but does not guarantee superior ROE once capital structure is priced in. Size without efficiency invites diseconomies; institutional age embeds informational advantages. Leverage's effect is context-sensitive: in settings with fragile funding markets, high leverage depresses equity returns, while in deep markets its impact may be neutral when governance is strong. These insights motivate the modelling choices in this paper: using ROA and ROE as complementary performance lenses; focusing on NPLR, CADR, and LTAR as core risk-intermediation indicators; and conditioning on bank-specific and time effects to net out unobservables and common shocks. They also shape interpretation: we expect NPLR to be negatively signed and economically large; CADR to be positively signed in a post-reform Ghana that prizes solvency; LTAR to support ROA more than ROE; BASZ to be weakly negative; BAGE to be positive; and LEVR to be negative where funding is costly and volatile. The empirical sections that follow validate much of this structure, and, taken together, reinforce a policy message: in Ghana's restructured banking landscape, enduring performance is built less on aggressive expansion and more on the quiet strength.

3 Data and Methodology

3.1 Data

The empirical analysis employs a balanced panel of fourteen commercial banks operating continuously in Ghana between 2010 and 2022. Banks were selected purposively from the population of twenty-three institutions on the basis of complete, audited annual financial statements over the study horizon. This design maximises internal validity by ensuring consistent coverage and variable construction across time and entities, while acknowledging the external validity trade-off associated with excluding banks with incomplete histories (e.g., entrants, exits, or merged entities during the post-cleanup period). The final sample comprises six domestically controlled and eight foreign-controlled banks, offering heterogeneity in business models and funding profiles germane to credit-risk transmission. All financial statements were retrieved from banks' official websites and cross-checked for internal consistency (totals, subtotals, year-to-year continuity). Performance measures and credit-risk indicators were computed directly from these statements using standardised definitions to ensure comparability.

Two complementary profitability metrics serve as dependent variables return on assets (ROA: earnings before interest and taxes divided by total assets) and return on equity (ROE: earnings before interest and taxes divided by total equity) reflecting operating efficiency and shareholder return respectively. Credit-risk and intermediation covariates include the capital adequacy ratio (CADR: total equity to total assets), non-performing loans ratio (NPLR: non-performing loans to total loans), and loans-to-assets ratio (LTAR: total loans to total

assets). Controls capture structural heterogeneity: bank size (BASZ: log total assets), bank age (BAGE: log years since Ghana licence), and leverage (LEVR: total debt to total equity). To limit undue influence of extreme values in profitability, ROE was winsorised at the 5th/95th percentiles; other variables were inspected for outliers and retained given economic plausibility. All series were aligned to calendar years; where fiscal-year definitions differed, figures were adjusted to the nearest calendar basis using disclosed periods.

3.2 Methodology

The identification strategy exploits within-bank variation over time using a two-way fixed-effects framework that partials out unobserved, time-invariant bank characteristics (risk culture, governance, client mix) and common annual shocks (macroeconomic conditions, regulatory changes). Panel dependence diagnostics (Pesaran CD) indicated significant cross-sectional correlation across banks, motivating the use of second-generation unit-root tests (CADF). Stationarity checks showed ROA, ROE, CADR, NPLR, BAGE and LEVR to be level-stationary, with LTAR and BASZ difference-stationary; baseline models were estimated in levels with year dummies and confirmed robust to replacing LTAR and BASZ with first differences. Model selection between random and fixed effects employed Hausman tests, which consistently rejected the random-effects assumption, justifying fixed effects for inference. Given heteroskedasticity and potential serial correlation, all regressions report bank-clustered robust standard errors; sensitivity checks with cross-section-robust estimators preserved significance patterns.

To mitigate specification risk, the empirical design follows a parsimonious-to-augmented approach. Benchmark models include CADR, NPLR, and LTAR as core credit-risk and intermediation indicators, then layer structural controls (BASZ, BAGE, LEVR) to test stability of coefficients. Multicollinearity was assessed via Variance Inflation Factors (all < 2.5), and functional-form adequacy via Ramsey RESET, which did not reject linearity once fixed effects and time effects were included. Endogeneity concerns are reduced but not eliminated by fixed effects and year dummies; remaining risks (e.g., reverse causality between profitability and capital) are addressed through lag sensitivity checks, which leave the main inferences intact. Collectively, the data strategy and estimation protocol provide a credible platform to quantify how asset quality, solvency buffers, and intermediation intensity map into bank performance in Ghana's post-reform landscape. Table 1 represents variables and construction.

Table 1: Variables and Construction

Variable	Definition / Construction	Role
ROA	EBIT / Total Assets × 100	Dependent
ROE	EBIT / Total Equity × 100 (winsorised 5–95)	Dependent
CADR	Total Equity / Total Assets	Credit-risk / Solvency
NPLR	Non-performing Loans / Total Loans	Asset Quality
LTAR	Total Loans / Total Assets	Intermediation Intensity
BASZ	ln(Total Assets)	Control (Scale)
BAGE	ln(Years since Ghana licence)	Control (Maturity)
LEVR	Total Debt / Total Equity	Control (Funding structure)

3.3 General Econometric Regression Model

Let $i = 1, \ldots, N$ index banks and $t = 1, \ldots, T$ index years. The baseline panel specification relating bank i 's financial performance to credit-risk indicators and controls is:

$$Y_{it} = \beta_0 + X'_{it}\beta + \alpha_i + \gamma_t + \varepsilon_{it} \tag{1}$$

where:

- Y_{it} is financial performance for bank i in year t, proxied alternately by ROA and ROE.
- X_{it} is a $K \times 1$ vector of observed regressors comprising credit-risk indicators and bank-level controls.
- β_0 is the overall intercept; β is the vector of slope coefficients.
- α_i captures time-invariant, bank-specific unobserved heterogeneity (bank fixed effects).
- γ_t captures year-specific shocks common to all banks (time fixed effects).
- ε_{it} is the idiosyncratic error term with $E\left[\varepsilon_{it} \mid X_{it}, \alpha_{i'}\gamma_t\right] = 0$.

Consistent with the study design, X_{it} includes three credit-risk indicators and three controls:

$$X_{it} = \left(CADR_{it}, NPLR_{it}, LTAR_{it}, BASZ_{it}, BAGE_{it}, LEVR_{it}\right)'.$$

Accordingly, the two estimable models are:
Model 1 (ROA):

$$ROA_{it} = \beta_0 + \beta_1 CADR_{it} + \beta_2 NPLR_{it} + \beta_3 LTAR_{it} + \beta_4 BASZ_{it} + \beta_5 BAGE_{it} + \beta_6 LEVI(2)_{ia})\,\alpha_i + \gamma_t + \varepsilon_{it}$$

Model 2 (ROE):

$$\widehat{ROE}_{it} = \beta_0 + \beta_1 CADR_{it} + \beta_2 NPLR_{it} + \beta_3 \downarrow \hat{A}R_{it} + \beta_4 BASZ_{it} + \beta_5 BAGE_{it} + \beta_6 LEVH_2 b + \alpha_i + \gamma_t + \varepsilon_{it}$$

Variable definitions (measurement consistent with Table 1)

- ROA_{it} : Return on assets (EBIT / total assets), in percent.
- ROE_{it} : Return on equity (EBIT / total equity), in percent.
- $CADR_{it}$: Capital adequacy ratio (total equity / total assets), %.
- $NPLR_{it}$: Non-performing loans / total loans and advances, %.
- $LTAR_{it}$: Loans and advances/ total assets, %.
- $BASZ_{it}$: Bank size, $\ln$ (total assets).
- $BAGE_{it}$: Bank age, $\ln$ (years since Ghana license).
- $LEVR_{it}$: Leverage, total debt / total equity.

Econometric interpretation

- Each β_k measures the partial effect of regressor k on performance, holding constant unobserved, time-invariant bank traits (α_i) and year-specific shocks (γ_t).
- E.g., $\beta_2 < 0$ would indicate that a higher NPL ratio is associated with lower ROA/ROE, ceteris paribus.
- Including α_i (bank fixed effects) controls for latent bank characteristics (e.g., risk culture) that do not vary over time but could bias OLS if correlated with X_{it}.
- Including γ_t (year fixed effects) absorbs macro-financial shocks and regulatory changes common to all banks in year t (e.g., the 2019 sector reforms, COVID-19 period).

Estimation approach

- We estimate (2a)-(2b) with panel least squares under fixed effects (FE) after model selection via a Hausman test (reported in Section 4.2), which indicated systematic differences between FE and RE estimates-favoring FE consistency.

- Given evidence of cross-sectional dependence (Pesaran CD test) and potential heteroskedasticity/serial correlation, we compute heteroskedasticity- and autocorrelation-robust standard errors clustered at the bank level (and, where appropriate, report robustness to cross-section-robust estimators).

- Stationarity properties were examined using a second-generation unit root (CADF) test; variables non-stationary in levels was differenced to achieve stationarity prior to estimation, as detailed in Section 4.1.2.

Identification and assumptions
Identification relies on within-bank variation over time in the regressors, conditional on γ_t. Key assumptions are:

1. $E\left[\varepsilon_{it} \mid X_{is}, \alpha_{i'}\gamma_s\right] = 0$ for all $s \leq t$ (strict exogeneity within the FE framework).

2. No perfect multicollinearity (verified via VIF diagnostics).

3. Sufficient within variation in X_{it} to identify β.

Under these conditions, the FE estimator of β is consistent and, with the stated robust errors, inference is reliable even under heteroskedasticity and serial correlation.

4 Analysis and results

4.1 Analysis and results

Table 2 reports summary statistics for 182 bank–year observations. The average Ghanaian commercial bank records an ROA of 3.61 percent, a level that is appreciably higher than the very low post-COVID estimates reported in recent studies and broadly comparable to but not meaningfully above earlier pre-clean-up evidence. This pattern suggests a modest recovery in asset profitability following the banking sector clean-up and associated reforms, without an outsized break from historical norms. Average ROE is 20.86 percent. Because ROE displays extreme observations, the series is winsorised at the 5th and 95th percentiles; the sample mean remains unchanged since it lies below the 95th-percentile cut-off, indicating that the central tendency is not driven by the tail. Relative to the literature, ROE in this sample is marginally above some post-COVID estimates and slightly below others, pointing to resilience in equity profitability rather than a dramatic uplift. On the credit-risk side, the average capital adequacy ratio (CADR) stands at 14.70 percent, which comfortably exceeds both the Basel III total capital guideline and the Bank of Ghana's statutory minimum; this is consistent with the recapitalisation thrust of the sector clean-up. The non-performing loans ratio (NPLR) averages 5.73 percent, while banks allocate, on average, 38.70 percent of total assets to loans and advances (LTAR). Banks are heterogeneous in scale and institutional maturity: mean log-assets (BASZ) equal 21.85, and mean age (BAGE) is 29 years, with a wide dispersion. Average leverage (LEVR) is 6.98, again with substantial spread. Taken together, these levels are consistent with a system that is well capitalised, operates with moderate loan intensity, and exhibits sufficient cross-sectional variation to credibly identify how credit-risk indicators map into profitability.

Table 2: Descriptive statistics (N = 182)

Variable	Mean	Std. Dev.	Min	Max
ROA	3.6107	3.0767	-8.4140	9.3120
ROE	20.8632	41.8465	-439.8957	68.0289
CADR	14.7035	4.6973	0.8919	44.1492
NPLR	5.7316	10.4954	0.0017	77.0465
LTAR	38.7023	12.3541	9.2126	68.1644
BASZ (ln assets)	21.8543	0.9939	19.1021	23.9778
BAGE (years)	29.4286	25.1939	1	107
LEVR	6.9781	8.1470	1.2650	111.1217

Notes: ROA, return on assets; ROE, return on equity; CADR, capital adequacy ratio; NPLR, non-performing loan ratio; LTAR, loans to assets ratio; BASZ, bank size; BAGE, bank age; LEVR, leverage ratio.

4.1.1 Cross sectional dependence test

Ghanaian banks respond to common macro-financial and regulatory shocks, so cross-sectional independence is unlikely. Pesaran's CD tests confirm strong and statistically significant cross-sectional dependence across all variables, with p-values effectively zero. This result cautions against first-generation panel procedures that assume independence and motivates the use of second-generation unit-root tests and fixed-effects estimators with robust inference. In economic terms, the outcome reflects the shared exposure of banks to system-wide developments such as the 2017–2019 sector reforms and the COVID-19 shock which synchronise behaviour and outcomes across the panel. Table 3 shows the cross sectional dependence test.

Table 3: Cross sectional dependent test

Varriable	Cross sectional dependence			
	ROA		ROE	
	CD-test	p-value	CD-test	p-value
ROA/ROE	+19.47	0.000	+20.26	0.000
CADR	+6.40	0.000	+6.40	0.000
NPLR	+18.89	0.000	+18.89	0.000
LTAR	+16.65	0.000	+16.65	0.000
BASZ	+33.69	0.000	+33.69	0.000
BAGE	+34.10	0.000	+34.10	0.000
LEVR	+9.48	0.000	+9.48	0.000

Notes: Under the null hypothesis of cross-section independence, CD N (0, 1) P-values close to zero indicate data are correlated across panel groups

4.1.2 Stationarity: second-generation CADF tests

Accounting for cross-sectional dependence, CADF tests indicate that ROA, ROE, CADR, NPLR, BAGE and LEVR are stationary in levels, whereas LTAR and BASZ require first differencing to achieve stationarity. The baseline fixed-effects specification is therefore estimated in levels with year dummies, and robustness checks substituting first differences for LTAR and BASZ preserve the core results. The stationarity profile implies that the profitability measures and the principal risk indicators are mean-reverting within banks, which is consistent with supervisory pressure, internal risk limits, and competitive dynamics that correct deviations over time. Table 4 below shows the results of the second-generation CADF test

Table 4: Second-Generation Panel Unit Root Test (CADF)

Second-generation panel unit root test				
Variables	Test statistic	1 % CV	5% CV	10 % CV
ROA	-1.920(0.0000)(a)***	-2.160	-2.280	-2.140
ROE	-3.441(0.085)(a)*	-3.070	-2.820	-2.680
CADR	-3.164(0.029)(a)**	-3.070	-2.820	-2.680
NPLR	-2.673(0.000)(a)***	-2.470	-2.260	-2.140
LTAR	-2.361(0.000)(b)***	-2.520	-2.280	-2.160
BASZ	-3.475(0.000)(a)***	-2.520	-2.280	-2.160
BAGE	-3.475(0.000)(b)***	-2.520	-2.280	-2.160
LEVR	-3.080(0.029)(b)**	-3.070	-2.820	-2.680

ROA, return on Assets; ROE, Return on equity; CADR, Capital adequacy ratio; NPLR, Non-performing loan ratio; LTAR, loans to assets ratio; BASZ, bank size; BAGE, bank age; LEVR, leverage ratio; **, *** denotes 5% and 1% significance level respectively, P-Values reported in parenthesis; (a), (b) denotes stationary at levels and stationary at first difference respectively; estimation lags, lags(2); chosen deterministic, trend

4.2 Model selection: Hausman tests

For both performance measures, Hausman tests strongly reject the null of no systematic differences between random- and fixed-effects coefficients. The rejection (p = 0.000) signals correlation between bank-specific heterogeneity and the regressors, rendering the random-effects estimator inconsistent. The analysis therefore proceeds with fixed effects and year dummies, identifying effects from within-bank variation over time while absorbing time-invariant bank traits and common shocks. The results of the Hausman test for both models (ROA, ROE) are reported in **Appendix 1**

4.3 Diagnostic checks: multicollinearity and omitted variables

Variance Inflation Factors range between 1.17 and 2.39 with a mean of 1.65, well below conventional thresholds, indicating that collinearity does not inflate variances or destabilise inference. Ramsey RESET tests do not reject the null of no omitted variables at conventional levels, supporting the linear functional form augmented by bank and year effects. Combined with robust standard errors clustered at the bank level, these diagnostics lend credibility to the inference drawn from the fixed-effects estimations. The results of the Variance Inflation Factor (VIF) and the omitted variable test are reported in **Appendix 2** and **Appendix 3** respectively.

4.4 Regression results and discussion

4.4.1 Model 1: ROA as performance proxy

Table 5: Fixed-effects estimates (dependent variable: ROA)

Regressor	Coef.	Std. Err.	t	p-value
CADR	0.2163	0.0415	5.21	0.000
NPLR	-0.1312	0.0145	-9.05	0.000
LTAR	0.0403	0.0183	2.20	0.029
BASZ	-0.6146	0.3115	-1.97	0.050
BAGE	2.4104	0.8800	2.74	0.007
LEVR	0.0105	0.0242	0.43	0.665
Constant	5.5878	5.5940	1.00	0.319

The ROA results reveal three mechanisms that jointly organise profitability on the asset side of bank balance sheets. First, stronger capitalisation is reliably associated with higher asset profitability. A one-percentage-point increase in the capital adequacy ratio raises ROA by about 0.22 percentage points, a magnitude that is not only

statistically significant but also economically relevant given the average ROA in the sample. This link is consistent with capital functioning as a performance technology: thicker buffers reduce expected losses and funding premia, stabilise intermediation, and free managerial attention toward margin and efficiency improvements. Second, deteriorating credit quality exerts a clear and material drag on ROA. A one-percentage-point rise in the non-performing loan ratio reduces ROA by roughly 0.13 percentage points, reflecting the combined effect of higher provisioning, foregone interest, and workout costs. The effect size rivals that of capital in absolute terms, indicating that credit risk management is a first-order determinant of asset profitability. Third, a greater allocation of assets to loans is associated with higher ROA, albeit with a smaller elasticity than the preceding drivers. This result aligns with the net-interest-margin channel: within prudent limits, deeper lending raises interest income relative to assets and thus improves ROA. Two structural characteristics condition these relationships. Larger banks display lower ROA at the margin, pointing to diseconomies of scale or balance-sheet bloat whereby asset expansion runs ahead of profitable opportunities or cost discipline. By contrast, institutional maturity strengthens asset profitability: older banks register higher ROA, plausibly due to accumulated informational capital, refined screening and monitoring practices, and reputational advantages that support pricing power. Leverage is not a significant predictor of ROA once bank and year effects are absorbed, which is intuitive because ROA emphasises operating efficiency and margin management more than the mix of debt and equity in the liability structure. Table 5 reports the fixed effects estimates with ROA as performance proxy

4.4.2 Model 2: ROE as performance proxy

Table 6: Fixed-effects estimates (dependent variable: ROE)

Regressor	Coef.	Std. Err.	t	p-value
CADR	1.1489	0.3474	3.31	0.001
NPLR	-1.0293	0.1215	-8.47	0.000
LTAR	0.1007	0.1535	0.66	0.513
BASZ	-8.1881	2.6078	-3.14	0.002
BAGE	17.3715	7.3678	2.36	0.020
LEVR	-4.1753	0.2030	-20.57	0.000
Constant	194.5656	46.8347	4.15	0.000

The ROE model reinforces the centrality of capital strength and credit quality while highlighting the disciplining role of conservative funding structures. A one-percentage-point rise in the capital adequacy ratio is associated with a 1.15 percentage-point improvement in ROE. Given that ROE reflects the residual claim after debt service and provisioning, this elasticity is larger than in the ROA model and indicates that equity holders benefit disproportionately from stronger solvency buffers that dampen earnings volatility and reduce the marginal cost of funds. Conversely, credit deterioration is particularly punitive for shareholders: a one-percentage-point increase in the non-performing loan ratio lowers ROE by just over one percentage point. The asymmetry between ROA and ROE in the response to NPLs reflects the fact that credit losses erode net income available to equity more directly than they affect asset-level returns. Unlike the ROA model, loan intensity is not a statistically significant driver of ROE. This disconnect implies that expanding the loan book, absent parallel improvements in risk pricing, screening, and recovery, does not automatically translate into higher returns to equity; quality, not just quantity, governs shareholder value. Size again carries a negative association with profitability, while institutional age is positively related to ROE, echoing the idea that seasoned banks monetise informational advantages and client relationships more effectively. Most strikingly, leverage exerts a large and precisely estimated negative effect on ROE. In the Ghanaian environment over the study period, higher debt intensity appears to amplify funding risk, compress net margins through a higher risk premium, and transmit shocks more

forcefully to the residual claimant, thereby depressing returns. This finding, together with the positive role of capital, points to a regime in which equity-rich balance sheets and rigorous credit-risk management dominate aggressive leverage as strategies for sustaining shareholder value. Table 6 reports the fixed effects estimates with ROE as performance proxy

4.5 Integrated narrative and implications

The results convey a coherent post-reform narrative. Recapitalisation has not merely satisfied regulatory quotas; it correlates with tangible improvements in the productivity of assets and in the stability and magnitude of returns to equity. Credit quality remains the fulcrum of profitability: even with stronger capital, elevated non-performing loans quickly erode asset returns and, more acutely, shareholder value. Loan expansion contributes to asset profitability but does not, by itself, enhance equity returns; the market rewards disciplined growth where pricing, risk selection, and recovery sustain margins at acceptable risk. The drag associated with scale suggests that expansion without operational excellence or risk-adjusted margin improvement results in diluted performance, while the positive association with bank age intimates that institutional learning and reputational capital are monetisable assets in their own right. Finally, the strongly negative relation between leverage and ROE cautions against debt-fuelled strategies; in an environment marked by regulatory tightening and macro-financial shocks, conservative capital structures generate the more robust and enduring performance profile.

4.6 Robustness and credibility of inference

The principal conclusions are robust to clustered inference at the bank level, the inclusion of year fixed effects, and alternative treatments of stationarity for variables that display unit roots under cross-sectional dependence. Low collinearity and the absence of functional-form misspecification support the reliability of the estimates. Hausman diagnostics consistently favour fixed effects, confirming that identification rests on within-bank variation over time while unobserved heterogeneity and common shocks are appropriately controlled. These features provide confidence that the estimated relations between credit-risk indicators, structural bank characteristics, and profitability reflect economically meaningful mechanisms rather than artefacts of specification.

5 Conclusion and Policy recommendations

5.1 Conclusion

This study investigated how credit risk translates into financial performance among Ghanaian commercial banks using a balanced panel assembled from audited annual financial statements of fourteen institutions over 2010–2022. The purposive sampling frame reflects data availability and coverage of banks with consistent reporting across the study horizon, thereby supporting reliable within-bank inference. Within a fixed-effects framework that absorbs unobserved bank heterogeneity and common year shocks, and after addressing cross-sectional dependence and stationarity, the empirical results are internally consistent and economically coherent. Two findings are pivotal. First, capital strength is performance-enhancing: higher capital adequacy ratios are associated with superior profitability on both assets and equity. This pattern is consistent with the notion that well-capitalised banks face lower expected losses and funding premia, operate with greater intermediation stability, and can price and allocate risk more efficiently, especially in a post-reform environment. Second, credit quality is decisive: increases in the non-performing loans ratio materially depress both ROA and ROE, with the impact particularly pronounced for returns to equity. The magnitude of this effect underscores the importance of underwriting discipline, early warning systems, and effective recovery processes. Loan intensity contributes positively to ROA but does not reliably lift ROE once risk and capital structure are accounted for, indicating that the quality of loan growth rather than its sheer volume is what sustains shareholder value. Structural

characteristics further condition outcomes: larger balance sheets are associated with weaker profitability while institutional maturity correlates with stronger performance, suggesting that disciplined scale and accumulated informational capital matter. Altogether, the evidence indicates that capital adequacy and credit-risk governance are the principal levers through which Ghanaian banks can stabilise and enhance profitability, whereas leverage-driven expansion and undisciplined asset growth are counterproductive.

5.2 Policy Recommendations

5.2.1 Recommendations for Bank Management

Bank executives should treat capital as a strategic asset rather than a regulatory minimum. Forward-looking capital planning that integrates stress testing, internal capital adequacy assessment processes, and dynamic balance-sheet projections is necessary to preserve buffers above minima through the cycle. Earnings retention policies can be calibrated to rebuild capital organically when market conditions or risk appetite do not justify external issuance, while judicious recourse to seasoned equity can finance growth without compromising solvency. At the same time, risk-weighted assets must be actively managed: portfolio optimisation that tightens concentration limits, revises sectoral risk weights where internal models support it, and accelerates disposal or workout of legacy impaired assets will raise the denominator's quality and protect capital ratios. Given the pronounced profitability penalty associated with credit deterioration, credit origination should be anchored in robust borrower analytics, calibrated collateral haircuts, and covenant design that allow timely intervention. Loan review mechanisms need to shift from backward-looking classification to continuous monitoring using early warning indicators, vintage analysis, and transition matrices that inform provisioning and pricing in real time. Where ROA benefits from measured loan expansion, management should privilege segments with defensible margins and demonstrable risk-adjusted returns, reallocating from low-yield passive holdings only when liquidity risk remains comfortably contained. Scale should be pursued through operational efficiency and digital productivity rather than balance-sheet bloat: process automation, data-driven collections, and cost discipline will mitigate the diseconomies that the results associate with mere size. Finally, capital structure should remain conservative. The negative association between leverage and ROE observed in the data implies that debt-intensive strategies, in this market context, amplify funding risk and earnings volatility to the detriment of shareholders; maintaining thicker equity cushions is a more reliable path to durable value creation.

5.2.2 Recommendations for Policymakers and Regulators

The post-cleanup architecture should continue to prioritise solvency and asset quality. Supervisory regimes that entrench countercyclical capital buffers and conservation buffers will help preserve resilience in upturns and reduce procyclicality in downturns. Calibrated incentives such as conditional tax relief on retained earnings dedicated to capital build-up or reduced levy rates for banks that sustain buffers above thresholds can align private incentives with systemic stability. Credit-risk governance should be strengthened through enforceable underwriting standards, prudent collateral valuation practices, and granular concentration limits that reflect correlated exposures. To support inclusion without compromising quality, regulators can promote the adoption of risk-based pricing and credit scoring frameworks particularly for SME and retail portfolios paired with credit registry enhancements that improve borrower visibility and reduce adverse selection. Regular supervisory stress tests, transparent publication of aggregate results, and supervisory guidance on early remediation will reinforce market discipline and protect the earnings capacity that underwrites intermediation. In parallel, liquidity regulation should ensure that efforts to reweight portfolios toward loans do not erode high-quality liquid asset buffers, maintaining confidence during funding stresses.

6 Recommendations for Future Research

Three avenues merit priority. First, expanding coverage to a larger universe of banks and extending the sample beyond 2022 would test whether the documented relations persist across different macro-financial regimes and regulatory refinements. Second, replicating the analysis in adjacent institutional segments credit unions, rural and community banks, and microfinance institutions with distinct capital requirements would clarify whether capital-performance and credit-quality effects generalise where business models and supervisory intensity differ. Third, incorporating richer measures of credit risk and performance, such as stage-wise expected credit losses, risk-adjusted margin metrics, fee-based income shares, cost-to-income dynamics, and market-based funding spreads, would illuminate the channels through which solvency and asset quality shape profitability. Methodologically, future work could exploit dynamic panel estimators that accommodate persistence in profitability and potential endogeneity between capital, risk, and performance, thereby deepening causal interpretation.

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APPENDICES

Appendix 1

Hausman Test for Model -1 (ROA), Fixed and Random Effect

ROA	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S. E.
CADR	.2162926	.1979016	.018391	-
NPLR	-.1312456	-.1342366	.002991	-
LTAR	.0403368	.0097562	.0305806	-
BASZ	-.6146013	-.1116665	-.5029348	.1709981
BAGE	2.410439	.7812691	1.629169	.7906166
LEVR	.0105288	-.0190911	.0296199	.0078736

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg
Test: Ho: difference in coefficients not systematic
$chi^2(6) = (b-B)'[(V\_b - V\_B) * (-1)](b-B) = 268.02$
$Prob > chi^2 = 0.0000$
$(V\_b - V\_B)$ is not positive definite)
Source: Estimated from Stata 15.

Appendix 2

Hausman Test for Model -2 (ROE), Fixed and Random Effect

Variable	Variance Inflation Factor		1/VIF	
	ROA	ROE	ROA	ROE
BASZ	2.39	2.39	0.419048	0.419048
BAGE	1.74	1.74	0.574388	0.574388
LTAR	1.64	1.64	0.610715	0.610715
CADR	1.52	1.52	0.658668	0.658668
LEVR	1.44	1.44	0.693505	0.693505
NPLR	1.17	1.17	0.854437	0.854437
Mean VIF	1.65	1.65		

ROA, return on Assets; ROE, Return on equity; CADR, Capital adequacy ratio; NPLR, Non-performing loan ratio; LTAR, loans to assets ratio; BASZ, bank size; BAGE, bank age; LEVR, leverage ratio
Source: Estimated from Stata 15.0

Appendix 3

Omitted variable test

Ramsey RESET test using powers of the fitted values of ROA and ROE	
Ho: model has no omitted variables	
ROA	ROE
$F(3, 172) = 3.57$	$F(3, 172) = 2.06$
$Prob > F = 0.1153$	$Prob > F = 0.1079$

Source: Estimated from Stata 15.0

Appendix 4

Abbreviations and their definitions

ABBREVIATIONS	DEFINITIONS
ACCESS	ACCESS BANK (GHANA) LIMITED
	ABSA ABSA BANK GHANA LIMITED
ADB	AGRICULTURAL DEVELOPMENT BANK LIMITED
BOA	BANK OF AFRICA GHANA LIMITED
CAL	CALBANK PLC
EGH	ECOBANK GHANA LIMITED
FBGL	FIDELITY BANK GHANA LIMITED
GCB	GHANA COMMERCIAL BANK LIMITED
PBL	PRUDENTIAL BANK LIMITED
RBG	REPUBLIC BANK GHANA PLC
SOGEGH	SOCIETE GENERALE GHANA LIMITED
SBGL	STANBIC BANK GHANA LIMITED
SCB	STANDARD CHARTERED BANK
ZBL	ZENITH BANK GHANA LIMITED
EBIT	EARNINGS BEFORE INTEREST AND TAXES
TTA	TOTAL ASSETS
TTE	TOTAL EQUITY
TTL	TOTAL LIABILITIES
TLA	TOTAL LOANS AND ADVANCES
NPL	NON-PERFORMING LOANS
AGE	AGE OF BANKS
ROA	RETURN ON ASSETS
ROE	RETURN ON EQUITY
CADR	CAPITAL ADEQUACY RATIO
NPLR	NON-PERFORMING LOAN RATIO
LTAR	LOANS TO ASSETS RATIO
BASZ	BANKS' SIZE
BAGE	BANKS' AGE
LEVR	LEVERAGE RATIO