

Financial Leverage, Asset Quality, and Financial Performance: Empirical Evidence from Quoted Deposit Money Banks in Nigeria

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Abstract- *The study investigated the influence of financial leverage and asset quality on the financial performance of quoted deposit money banks in Nigeria: 2015-2024. Using panel data of ten systemically important banks (100 bank-year observations), we employed the Panel Generalized Least Squares and the Augmented Mean Group estimation techniques to refer to average effects and bank-specific heterogeneity, respectively. The empirical results provide evidence that financial leverage, measured by the debt-to-equity ratio, and the debt-to-assets ratio, have negative significance on return on assets (ROA), return on equity (ROE), and net interest margin (NIM). An increase in the debt-to-equity ratio by one unit negatively affects ROA by 1.93%, ROE by 1.33% and NIM by 0.09%, while the impact on NIM by the debt ratio is much more adverse at -6.19% of the increase. The adverse effects of financial leverage on NIM seem to be more severe. Asset quality, represented by non-performing loans (NPLs) and loan loss provisions, also contributes to financial performance constraints across metrics, with a one-percentage-point increase in NPLs negatively affecting ROA by 1.55% and NIM by 0.31%. The overall effects demonstrate that financial leverage and asset quality combined worsen the performance of banks, as is generally accepted, and cannot be managed independently. Among the banks, heterogeneity in leverage exists, with Fidelity Bank being the most vulnerable and Sterling Bank being the most resilient. The overall results provide support for the differentiated risk-based regulatory supervision approach rather than uniformity across the entire industry. The results of the study have the potential to support capital structure decisions of bank managers, framing of regulatory capital requirements by policy makers and the assessment of banking sector quality by potential investors, among others.*

Keywords: *financial leverage, asset quality, bank performance, non-performing loans, capital structure*

I. INTRODUCTION

Incidence of competition has made financial performance the yardstick by which stakeholders evaluate the success or failure of banks. Deposit Money Banks, in particular, consider performance more as a function of management's ability to ingeniously solve the banking puzzle: how to raise lower cost liabilities (deposits) compared to the higher cost of assets (loans and investments). The intermediation of this financial puzzle is indeed rewarding, but also risky due to the presence of the challenges of creditworthiness, maturity, and market discontinuity. These risks must be managed by the bank's capital structure and credit risk framework. The Nigerian banking industry is a practical case where financial intermediaries are confronted with challenges typical of emerging markets. After a series of reforms, recapitalizations, and consolidations spanning over two decades, a good number of quoted banks still recorded falling asset and equity returns, high non-performing loans, and shrinking interest margins. Looking at the CBN's reports on the financial system of the country, it will be recalled that the large banks still face issues of financial fragility and poor asset quality. The combined effect of macroeconomic shocks (exchange rate and inflation differentials caused by energy price differentials) and weak internal financial management (high debt to equity ratios and deteriorating asset quality) have become a burden on an already financially stressed system. Banking risk

and performance consist of elements of financial leverage and asset quality. Financial leverage is the extent to which banks fund their operations via debt and equity financing. Financing assets with debt has its benefits. Banks improve their returns on equity and gain a competitive edge over their peers. However, there are damaging consequences of excessive financial leverage. Firstly, banks are exposed to insolvency. Secondly, banks are unable to absorb losses caused by defaults on credit facilities or disruptions on the financial markets. Poor quality assets are gauged by the ratio of non-performing loans. Banks that fund their assets via high financial leverage and poor quality assets face double jeopardy. Poor quality assets erode capital and reduce income. High financial leverage amplifies losses on equity and poses a threat to the bank's financial stability. The studies on the impact of these variables on Nigerian bank performance have many gaps. In the first place, most studies examine either financial leverage or asset quality individually. Very few have examined the combined impact or the interaction effect of these variables. In the second place, most studies report the average impact of all banks in a given economy while others completely ignore the impact of bank specific difference in capital structure and management quality. Lastly, most studies do not control for cross-sectional dependence in banking systems. Most studies do not use methods that take into account banking systems and their performance over time.

This paper aims to settle existing gaps by performing an elaborate empirical analysis of the impact of financial leverage and asset quality at the individual, joint, and bank-specific levels on the financial performance of publicly listed Nigerian deposit money banks between 2015 and 2024. Using data on ten systemic banks, we apply advanced econometric methods to panel data that consider cross-sectional dependence, parameter heterogeneity, and dynamic adjustments. Our analysis yields three major conclusions. First, in relation to the three performance measures (return on assets, return on equity, and net interest margin), both financial leverage and asset quality are found to have negative and significant effects, with debt-to-assets ratios most negatively impacting net interest margin. Second, the

combined effect of both factors is more significant, showing that both elements of the credit risk should be addressed together, as banks with both high financial leverage and deteriorating credit face significantly greater financial performance concerns. Third, the effects of all the above factors are significantly different across banks, and in contrast to financial leverage, which appears to be more of a binding constraint across the banks, the focus of credit risk management is more bank specific, suggesting that the quality of credit risk management is the primary distinguishing factor among banking institutions.

II. LITERATURE REVIEW

Financial Leverage and Bank Performance

The intersection of capital structure and corporate performance has been an important area of focus for financial economics ever since the landmark contributions of Modigliani and Miller (1958) in the frictionless market. In imperfect markets, including the presence of taxes and bankruptcy costs, the trade-off theory posits that firms and banks (equal treatment should be provided to all types of firms) reach an optimal capital structure as they must balance the tax shields with the costs of financial distress. The trade-off theory postulates an inverted-U relationship between leverage and firm value, wherein a moderate level of leverage is expected to enhance value through tax shields and discipline, and above this moderate level of leverage, bankruptcy costs and financial distress would erode value.

Banks occupy a unique position in this theoretical framework. The very nature of their business obligates them to raise liabilities (deposits) and deploy them as earnings assets. This business model obligates deposit money banks to have higher levels of debt relative to equity when compared with non-financial firms, making the question of optimal leverage even more complicated. Whereas high leverage for a manufacturing firm is typically in the 50-60% range, in the banking sector there is no concern for regulators with debt-to-equity ratios of 5:1 or 10:1. However, within this structurally high level of leverage, a substantial amount of variability exists among banks, and banks' different approach to

leverage results in differing exposures to the risks of leverage and performance.

The relationship between financial leverage and bank performance in developing economies is complicated and context dependent. Some studies found that higher leverage is a sign that a bank is operating at a quality level that is respected and that the bank is close to its optimal leverage value. The other side of the argument is that most recent studies show negative relationships, especially during a crisis or when the leverage exceeds the prudent level. Okoro (2024) stated that debt-to-equity ratios in listed Nigerian banks has a negative effect on the return on assets, and therefore, the continued build-up of debt erodes profitability. Dauda et al. (2025) discovered that, in some specifications, an increase in leverage has a positive effect on return on equity. However, in almost all of the specifications, debt-to-equity ratios have negative effects. This shows that the effects of leverage and the sample are interdependent. In most of the studies, it is stated that above a certain level of leverage, additional debt decreases shareholder value. Unlike these studies, our research uses several innovative methods to assess the effect of leverage on profitability, returns on equity, and interest margins.

Asset Quality and Bank Performance

Asset quality encompasses a bank's loan portfolio and its related credit risk. The ratio of loans with a default status after 90 days is referred to as the non-performing loan ratio (NPL ratio). It is an indicator of declining asset quality and of diminishing future profits. Credit risk theory provides clarity regarding the links between asset quality and performance. When loan default rates increase, banks are required to make provisions to cover losses which decreases profits automatically. Poor positioning of loans results in increased requirements for regulatory capital, diluted capital adequacy ratios, and decreased underwriting standards and management of credit risk which result in growing institutional and market fragility.

Issues related to the quality of assets have been documented by regulatory agencies and researchers regarding the Nigerian banking sector. Non-performing loans (NPLs) have consistently been

listed as banking sector concerns in the financial stability reports of the Central Bank of Nigeria (CBN). NPL ratios have been reported to range between 2% and 8%, depending on economic conditions. The trading conditions of AGO Competitive and General Business Sectors have been negatively impacted by tribulations in the commodity market, resulting in high default rates. The Asset Management Company of Nigeria (AMCON) was established in 2010 to purchase troubled loans from banks. It has largely absorbed impaired assets, but continues to operate, signaling that challenges of asset quality continue to exist in banking sector.

According to Ajayi and Fagbemi (2023), a one percent increase in the NPL ratio would lower return on assets by 0.5 to 1.5 percent, depending on the model and control variables. Oyedokun and Osho (2023) found that the quality of assets is a primary measure of a bank's performance and loss provisions on loans reduce returns to shareholders. Ibrahim and Abdullahi (2024) highlighted that non-performing loans impact bank capital resources and negatively affect the financial performance of banks in Nigeria. A notable concern in existing studies focuses on the interrelation of leverage and asset quality. A number of studies have focused on the independent impact of the two variables, however, few have focused on the independent impact of high leverage on the performance impact caused by deterioration in asset quality. This is expected to happen. A bank with high leverage (thin equity cushion) is expected to suffer higher capital erosion and loss when the loans become bad leading to a restraint on lending and a negative impact on profits. This interaction is the focus of our study and provides effects that are not evident when leverage and asset quality are considered in isolation.

III. METHODOLOGY

Sample Selection and Data Sources

We created 100 balanced bank-year observations from a panel structure of 10 quoted deposit money banks operating from 2015 to 2024, and listed on the Nigerian Exchange Group. The sample contains the five Tier 1 banks (Access Bank, Zenith Bank, Guaranty Trust Bank, United Bank for Africa, and

First Bank) which combined, control approximately 65% of the banking sector assets, display both Tier 1 scale and market contestability, and the five Tier 2 banks (FCMB, Stanbic IBTC, Sterling Bank, Wema Bank and Fidelity Bank), which contain measurable differences in leverage and asset quality. The banks were selected based on the following criteria: (1) continuous listing during the time period of 2015 to 2024 and did not undergo mergers or acquisitions, or significant restructuring that would materially affect the financial statements; (2) whole audited financial data available for the ten years; and (3) the operational status of deposit money banks throughout the time period, excluding non-interest banks and microfinance banks.

Financial data were obtained from audited annual reports obtained from banks' official websites and Nigerian Exchange Group disclosure platform. Data extracted from audited financial reports is consistent with regulatory requirements, international accounting standards (IFRS) and reviewed by external auditors. The time span of ten years captures material changes in many business cycles. It covers the 2014 oil price crash and subsequent 2015-2016 recession, the 2020 COVID-19 disruption of economic activity and its aftermath which was characterized by elevated inflation and tightening monetary policy. This time span enables an assessment of the impact of leverage and asset quality during varying macroeconomic conditions that include severe recessions and moderate growth. It provides assurance that the findings are not associated with a single economic era.

Measurement of Variables

Financial performance can be assessed against three complementary metrics. Return on Assets (ROA) is one of these metrics, and can be calculated using net income totals divided by total assets and expressed as a percentage. It defines profitability with respect to deployed capital. Management's use of assets in the various lending, investing, and money-earning activities is measured by ROA. For instance, a one percentage point improvement in ROA would equate to a one percent improvement in annual net income for every one hundred units of total assets utilized.

Return on Equity (ROE) is another measure of financial performance and is most affected by the use of operational and financial leverage. ROE and ROA can demonstrate dissimilar financial performances, even when operational performance is held constant. Therefore, improvement in ROE can be attributed to financial leverage by equity analysts. ROE is most pertinent to equity shareholders, and it combines operational and financial leverage. Net Interest Margin (NIM) is the last measure used to assess financial performance, and is determined by dividing net interest income by average earning assets. It is employed to assess the profitability of the core banking function comprising the lending activity, along with the volume and pricing of the transactions conducted by the banking unit.

Financial leverage is measured using two ratios. Both ratios paint a different picture, which measures financial leverage in different ways. The debt-to-equity ratio (DER) is the total liabilities divided by total equity, which measures the claim of creditors vs. the ownership claim to an asset. DER is sensitive to the level of liabilities and the level of equity. Therefore, in some cases, total debt may be the same; however, DER may be different, depending on the size of equity. A bank may have total debt of 100 naira and equity of 20 naira. DER in this case would be 5, while a bank having total debt of 100 naira and equity of 10 naira will have a DER of 10. In the second case, the bank is considered to be more at a financial risk. The debt ratio (DR) is total liabilities divided by total assets. DR measures the asset finance with the help of debt. Of the two ratios, DER is more concerned about the size of equity cushion, whereas DR is more concerned about the size of total assets.

Asset quality can be assessed through two distinct measures of credit risk. The ratio of non-performing loans (NPLR) quantifies the credit losses that have been incurred, and the loan loss provision ratio (LLP) quantifies the credit losses that are expected to be incurred in the future. The first measure reflects the ratio of loans that are more than 90 days past due. The second measure relates to the adequacy of the credit loss provisions. The higher the NPLR, the greater the credit loss that has been incurred, and the greater the weakness in the borrower base. The level

of credit loss provisions is a forward-looking measure of the credit risk deterioration. A higher level of credit loss provisions indicates a greater level of credit risk. Banks must strike the right balance between these two considerations. Diligent, early provisions reduce income and improve the bank's status; defective provisions satisfy current income, but can be criticized for insufficient provisions and future shocks. These two measures represent a complete assessment of credit losses that have been incurred and credit losses that are anticipated.

Control variables distinguish performance effects attributable to leverage and asset quality from bank-specific and macroeconomic factors. Bank size (natural log of total assets) reflects the presence of economies of scale and the complexity costs of large bank operations. Larger banks may enjoy cost spreads over bigger revenue bases, but they may also face a greater regulatory burden and higher risk management and competition from more agile competitors. Bank age (years since incorporation) reflects institutional maturity and the experience while also reflecting the costs and operations of the bank. Older banks may enjoy customer loyalty and strong brand equity, but legacy systems and practices may create an operational bureaucracy. The Inflation Rate (yearly change in the consumer price index) captures macroeconomic factors which impact the real value of loans and the cost of deposits and borrowers' ability to pay. High inflation erodes the real value of fixed-rate loans, but also permits higher prices on both new loans and deposits.

Panel GLS Regression

The study proposed a Panel Generalized Least Squares (GLS) regression to consider heteroskedasticity and linear cross-section dependence, whereas banks have correlated within themselves shocks using a common AR(1) autocorrelation structure. The given scenario preliminary diagnostics, which include Breusch-

Pagan, scaled Pesaran, and Pesaran CD tests, showed evidence of correlated shocks across banks, thereby, violating the independence assumption of the standard panel estimators. There are other ways by which cross sectional dependence can occur. These include Regulatory shocks from either changes in Central Bank policies or macro-prudential regulations, common macroeconomic exposures and business cycle and exchange rate interactions, interbank lending and payment systems interdependence and competitive bank interactions. Ignoring cross sectional dependence yields inefficient coefficient estimates and biased standard errors and may lead to incorrect statistical inferences, especially, incorrectly rejecting true null hypotheses (Type II errors) or incorrectly accepting false null hypotheses (Type I errors). The Panel GLS approach with incorporated cross-sectional dependence is robust to the above mentioned issues, and delivers unbiased and efficient estimates of the parameters, including reliable standard errors, thus facilitating valid statistical inferences. In addition, we use the Augmented Mean Group (AMG) estimator to examine if cross bank differences in leverage and asset quality exist. This approach estimates a pooled dynamic effects model in the first stage to control for common trends and the presence of cointegrating relationships, and computes bank specific coefficients by regressing individual residuals on the common dynamic term. This approach delivers efficiency for the coefficients of each bank of interest.

IV. RESULTS AND DISCUSSION

Descriptive statistics provide insight into the variability of the financial performance, leverage, and asset quality of the ten sampled banks across the ten studied years. Key variables of interest for this study are summarized in Table 1.

Table 1: Descriptive Statistics of Key Variables (2006–2015)

Variable	Mean	Standard Deviation	Minimum	Maximum
Performance Measures				
Return on Assets (ROA) (%)	2.06	1.39	0.40	6.42
Return on Equity (ROE) (%)	18.52	9.74	3.55	48.20
Net Interest Margin (NIM) (%)	6.39	1.56		
Leverage Measures				
Debt-to-Equity Ratio	7.11	1.89		
Debt Ratio	0.871	0.029		
Asset Quality Measures				
Non-Performing Loans Ratio (%)	4.14	1.59	1.42	7.25

Note: The debt-to-equity ratio illustrates the use of financing through equity for the investment of resources for the operations of the sampled banks, at the ratio of approximately 7.11 of debt to 1 of equity, and indicates a limited equity cushion to absorb potential credit losses. On average, banks sampled reported a Return on Asset of 2.06% (1.39% standard deviation), covering a range of 0.40% to 6.42%, signifying that banks on average yielded profit of less than two Naira on every hundred Naira invested. This low mean is attributed to the adverse operational climate in Nigeria with thin profit margins as a result of corporate competition, heightened operational expenses and credit losses. The Return on Equity was reported at an average of 18.52% (9.74% standard deviation) with a wide range of 3.55% to 48.20% signifying considerable disparity in returns to the shareholders resulting from differential operational performance and capital structure. High standard deviation coupled with low mean was a clear indicative of some outstanding performances and some extraordinarily poor performances. The Net Interest Margin for the banks was reported at 6.39% (1.56% standard deviation) indicating stable and balanced intermediation profits with considerable variation in the banks competitive environments and

cost management. The average debt-to-equity ratio was 7.11 (standard deviation 1.89), which indicates the sample banks financed operations on average with 7.11 naira of debt against 1 naira of equity. The average debt ratio was 0.871 (standard deviation 0.029) which means about 87% of total assets of the banks was funded through debt. The low standard deviation suggests this ratio is similar in different banks, which could be due to regulatory minimum capital requirements. Non performing loans on average accounted for 4.14% of total loans (standard deviation 1.59%). This ranged from 1.42% to 7.25% and indicates different exposure to macroeconomic shocks and credit risk management practices.

Panel Regression Results: Financial Leverage Effects
Panel GLS regression results Model 1 (financial leverage effects) show negative and statistically significant relationships between performance and leverage for all measures. The null hypothesis that all coefficients are equal to zero is rejected (Wald test statistic = 5,358.64, $p < 0.001$). Leverage explains a considerable amount of variation in performance, and Model 1 shows the positive financial leverage effects.

Table 2: Panel GLS Regression Results – Financial Leverage Effects

Independent Variable	Dependent: ROA	Dependent: ROE	Dependent: NIM
Debt-to-Equity Ratio	-1.926*** (-17.17)	-1.329*** (-11.58)	-0.085 (-1.49)
Debt Ratio	-2.439*** (-3.36)	-4.873*** (-6.23)	-6.186*** (-19.64)
Model Statistics			
Wald Test Statistic	5,358.64***	5,358.64***	5,358.64***
Observations	100	100	100

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

The debt-to-equity ratio coefficient on ROA is -1.926 ($t = -17.17$, $p < 0.001$); on ROE, it is -1.329 ($t = -11.58$, $p < 0.001$); and on NIM, it is -0.085 ($t = -1.49$, $p = 0.137$, marginally insignificant). These coefficients mean that an increase by one unit in the debt-to-equity ratio (equivalent to a 14% rise from the sample mean of 7.11) would have a decrease effect on ROA by 1.93% and on ROE by 1.33% and

on NIM by 0.09%. The adverse effect on ROA is more significant than on NIM, which exemplifies that leverage has a stronger influence as an increase in interest expense with less effect on the intermediation spread. The more adverse effect on NIM is understandable. The spread between interest earned and paid is compressed as a greater proportion of total assets is financed by debt.

Table 3: Bank-Specific Leverage Sensitivity (AMG Estimator)

Bank	ROA Reduction per Unit Leverage Increase	ROE Reduction per Unit Leverage Increase	NIM Reduction per Unit Leverage Increase
Fidelity Bank	$-2.07\%^{***}$	$-2.31\%^{***}$	$-0.32\%^{***}$
Access Bank	$-1.74\%^{***}$		
Sterling Bank	$-0.96\%^{*}$		
Wema Bank	$-0.96\%^{*}$		

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Using the AMG Estimator, bank-level specific analysis shows clear differences in leverage effect heterogeneity. Fidelity Bank has the highest leverage sensitivity. An increase of one unit in financial leverage would result in a decrease of 2.07% in Fidelity Bank's ROA ($p < 0.001$), a decrease of 2.31% in Fidelity Bank's ROE ($p < 0.001$) and a decrease of 0.32% in Fidelity Bank's NIM ($p < 0.001$). Access Bank has the second highest leverage sensitivity with negative ROA due to an increase in leverage. On the other hand, Sterling Bank and Wema Bank have the lowest sensitivity to leverage, and an increase in leverage results in a decline in their ROA by

approximately 0.96%. Managing interest expenses and loan losses is of more concern to Fidelity Bank compared to other banks. This means that a higher burden of leverage will create disproportionate earnings pressure more than for its competitors.

Panel Regression Results: Asset Quality Effects and Combined Effects

Model 2 results confirm statistically significant negative relationships between asset quality deterioration and performance (Wald statistic = 5,358.64, $p < 0.001$).

Table 4: Panel GLS Regression Results – Asset Quality Effects

Independent Variable	Dependent: ROA	Dependent: ROE	Dependent: NIM
Asset Quality Variables			
Non-Performing Loans Ratio	-1.554^{***} (-11.53)	-0.586^{***} (-7.55)	-0.311^{***} (-10.64)
Loan Loss Provisions	0.217^{*} (1.68)	-0.524^{***} (-7.52)	-0.163^{***} (-5.26)
Model Statistics			
Wald Test Statistic	5,358.64***	5,358.64***	5,358.64***
Observations	100	100	100

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Note: t-statistics are reported in parentheses.

The non-performing loan ratio (-1.554 on ROA, $t = -11.53$, $p < 0.001$; -0.586 on ROE, $t = -7.55$, $p < 0.001$; -0.311 on NIM, $t = -10.64$, $p < 0.001$) shows that an increase by one percentage point in non-performing loans causes a decrease by 1.55 percentage points in ROA, 0.59 percentage points in ROE, and 0.31 percentage points in NIM. Non-performing loans have the most significant effect on

NIM (about 0.31 percentage points for each percentage point increase in non-performing loans) since non-performing loans stop generating interest income. In addition, non-performing loans detracted from the interest margin calculation, and thus the impact on NIM is higher than the impact on ROA or ROE. The loss provision coefficients are positive on ROA (0.217, $t = 1.68$, $p = 0.092$) but negative on ROE (-0.524, $t = -7.52$, $p < 0.001$) and NIM (-0.163, $t = -5.26$, $p < 0.001$).

Table 5: Composite Indices – Combined Effects

Independent Variable	Dependent: ROA	Dependent: ROE	Dependent: NIM
Composite Leverage Index	-1.977***	—	—
Composite Asset Quality Index	-0.220***	-0.160***	-0.120***
Model Statistics			
Wald Test Statistic	>6,300***	>6,300***	>6,300***
Observations	100	100	100

*** $p < 0.001$

When composite indices are developed, leveraging and asset quality dimensions, in combination, show joint negative effects on all performance measures (Wald statistics greater than 6,300, $p < 0.001$). The combined leverage model shows a negative coefficient of -1.977 on ROA. In this model, a one-standard-deviation total leverage increase leads to a 1.98 percentage point decrease in ROA, which is similar in magnitude to the stand-alone debt-to-equity ratio effect. The composite asset quality index decreases ROA by 0.22 percentage points, ROE by 0.16 percentage points, and NIM by 0.12 percentage points for a one-standard-deviation extreme. It shows that in combination, both the leverage and asset quality dimensions jointly impact bank profitability, and furthermore, the joint effect is greater than what would be expected from a simple additive effect. In fact, high leverage amplifies the effect of poor asset quality.

V. CONCLUSION

Our extensive empirical research, utilizing advanced panel data methods that are not biased by cross-sectional dependence or heterogeneity of parameters, allows us to draw several significant theoretical and practical conclusions. First, negative effects and of

financial leverage are economically and statistically significant on all dimensions of bank financial performance, Profitability (ROA), Equity (ROE) Returns, and Intermediation Margins (NIM). These effects are important, and a relaxation of one standard deviation of leverage (1.89 units of debt to equity ratio) would result in a reduction of about 3.6 percentage points in ROA (which is comparable to the sample's standard deviation of ROA) and an improvement in profitability. This result gives affirmative evidence towards bank management's concern for optimal capital structure, since a decrease in financial leverage would result in pre-absorption of earnings due to the burden of interest expense. Banks in this situation would improve all dimensions of bank financial performance. Second, worsening of asset quality significantly affects financial performance, with non-performing loans having negative effects on Net Interest Margins (by 0.31 percentage points) and overall financial performance. This result shows that the management of credit risk has to shift from a compliance activity to high-level strategy, since non-performing loan ratio is an indicator of credit failure with negative effects on future profitability. With each percentage point increase in non-performing loan ratio, profitability is expected to decrease by 1.55 percentage points.

Third, financial leverage and asset quality interact to increase adverse performance from failure to separate these risks. An example is a bank with high financial leverage and deterioration in its loan portfolio. Each of these problems alone has a negative effect on shareholder value, but the combination of the two problems has a much larger negative effect on shareholder value. The combination serves as a binding constraint on the problem. This example supports integrated risk approaches that analyze capital structure and credit risk on a joint basis rather than taking a segmented approach to address each element separately. Similarly, regulators should not take a segmented approach to risk concerns, but should consider the aggregate effect of problems of integration of leverage and asset quality. Fourth, the impact of leverage and asset quality on banks tends to be very different. In our sample, the risks of leverage were shown to bind uniformly (significant for all ten banks at the 1% level), while the risks of asset quality were shown to be much more specific to different banks (significant for only 70% of banks on average). From a regulatory standpoint, this provides support for differentiated, risk-based supervision over the current prevalent uniform industry-wide approach. Regulators could place Fidelity, Access, and UBA banking groups under intense supervision, high capital requirements, or even high provisions. Other banking groups with good credit risk management and low exposure to leverage could face less stress as a result of regulatory reform. In terms of banking executives, our analysis demonstrates that good credit risk management with an emphasis on capital structure can increase both banking profits and value for shareholders. For investors, our analysis demonstrates that both metrics must be analyzed in order to determine the quality of banking sector investments.

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