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BANK PROFITABILITY AND LIQUIDITY MANAGEMENT: A CASE STUDY OF SELECTED NIGERIAN DEPOSIT MONEY BANKS

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Abstract

The issue of liquidity-profitability trade off is well documented in the literature. This study was carried out to examine the liquidity-profitability trade off of deposit money banks in Nigeria. The study was carried on fifteen deposit money banks in Nigeria and covered a panel data of 2010 to 2012. Two models were specified and estimated using Ordinary Least Squares (OLS) technique. The empirical results revealed that there is a statistically significant relationship between bank liquidity measures-current ratio, liquid ratio, cash ratio, loans to deposit ratio, loans to asset ratio- and return on equity. However, when return on asset was used as proxy for profitability, the relationship became statistically insignificant. It was suggested that the banks should evaluate and redesign their liquidity management strategy so that it will not only optimize returns to shareholders equity but also optimize the use of the assets.

Keywords: Liquidity, Profitability, DMBs, Trade-off, Nigeria

INTRODUCTION

In every system, there are major components that are paramount to its survival. This is also applicable to the financial system where deposit money banks contribute significantly to the effectiveness of the entire system. They do this by providing an efficient mechanism for the mobilization of resources and efficiently channeling them for productive investment (Wilner, 2000). Therefore, the two major functions of deposit money banks, deposit mobilization and

credit extension define their financial intermediation role in the economy. However, efficient financial intermediation by a deposit money bank demands the purposeful attention of the bank's management to the conflicting goals of liquidity and profitability. Both goals run in opposite direction in the sense that an attempt by a bank to achieve higher profitability will certainly take a toll on the liquidity level and solvency position and vice versa (Olagunji, Adenanju and Olabode, 2011).

Liquidity is the ability of a deposit money bank to pay its short-term obligations to its depositors and creditors. On the other hand profitability is the measure of the difference between the bank's operating expenses and income. However, liquidity and profitability can be likened to two centrifugal forces with contradictory objectives which at all times threaten to pull the bank apart. Practically, profitability and liquidity can be used as objective indicators of not only deposit money banks but all profit oriented organizations (Eljelly 2004).

Profitability and liquidity as performance indicators are very important to the major stakeholders: shareholders, creditors and tax authorities. The shareholders are interested in the profitability of banks because it determines their returns on investment. Depositors are concerned with the liquidity position of their banks because it determines the ability to respond to their withdrawal needs, which are normally on demand or on a short notice as the case may be. The tax authorities are interested in the profitability of the banks in order to determine the appropriate tax obligation (Olagunji, et al., 2011).

The contradictory nature of liquidity and profitability can be explained by the intuitive reasoning that a bank operating with high liquidity (and in the process tying down investable funds) may have a low insolvency risk, but with a trade-off of low profitability. Conversely, a bank operating at a low liquidity level (and thus freeing investible funds) may face high insolvency risk, but with a trade off of higher profitability.

In the Nigerian case, the operating environment is so competitive and tense that any deposit money bank that hopes to survive must ensure an astute management of its profitability viz-a-viz its liquidity level as both variables can make or mar its future. It is therefore self-evident that every deposit money bank needs to strike the right balance between its liquid assets and total assets to maintain its liquidity (meeting short-term obligations to depositors and creditors) and remain profitable (adding value to shareholders wealth).

The challenges of inefficient liquidity management of banks in Nigeria were brought to the fore during the liquidation and distress era of the late 1980s and early 1990s. The negative cumulative effects of the banking system liquidity crisis from the 1980s and 1990s lingered up to the re-capitalization era in 2005 in which banks were mandated to increase their capital base from N2 billion to an astronomical N25 billion. This move by the apex bank was believed would

stabilize and rectify the bank liquidity problem that was prevalent in the economy (Fadare, 2011).

However, after five years of what was applauded as a fortified repositioning of banks against liquidity shortage; the Central Bank of Nigeria in 2009 came on a rescue mission to save five illiquid banks. The global financial crisis of 2008 also had its toll on the already weak confidence and easy financial conditions, forcing the Central Bank of Nigeria used both conventional and unconventional measures to inject liquidity into the system.

In its rescue mission in 2009, the Central Bank injected N620 billion to save the five banks that were operating on negative shareholders' funds. The use of such an unconventional measure became necessary as the regular monetary policy transmission mechanism got seriously impaired by the liquidity crisis that warranted the setting up of an agency, Asset Management Corporation of Nigeria (AMCON) to buy out the bad debts of the affected banks (Fadare, 2011).

It can also be recalled that way back in 2004, although there were 89 deposit money banks in Nigeria, 10 were assessed as being sound, 51 as satisfactory, 16 as marginal and 12 as unsound (Bassey, 2012). According to Soludo (2004), the problem with the unsound deposit money banks included persistent illiquidity, poor asset quality, weak corporate governance and gross insider abuses. Also most of the banks had weak capital base thus constraining them to overdraw their accounts with the Central Bank of Nigeria and high incidence of non-performing loans.

From an academic perspective, the literature on the twin concepts of liquidity and profitability is broad and varied. However, until recently especially in 2013, the empirical evidence within the Nigeria context had been rather scanty. In addition, some of the studies carried out on Nigeria such as Olagunji et al. (2011) made use of questionnaires. The results of such studies need to been taken with caution because of biased responses based on the position/prejudice of the respondents. Some others such as Uremadu (2012) made use of time series data with aggregate macro-economic variables of the banking system. This implies the data were not drawn from the actual financial statements of the commercial banks.

In effect, there is a missing gap in the Nigerian literature as there are few studies that have extracted data from the annual statements of deposit money banks to empirically investigate the profitability- liquidity nexus. Thus, this study will not only investigate the effect of liquidity levels on profitability of commercial banks, it will also contribute to the missing gap in the extant literature.

REVIEW OF RELATED LITERATURE

Deposit money banks are business firms and therefore aim to maximize profits. Their profits are primarily from interest on their earning assets, such as loans and investment. However, most of their liabilities are deposits payable practically on demand. For that reason, managing healthy liquidity level while at the same time maximizing profit becomes essential to any bank.

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Concepts of Liquidity and Profitability

Concept of Liquidity

According to Olagunji, et al. (2011), liquidity refers to the ability of a bank to ensure the availability of funds to meet financial commitments or maturing obligations at a reasonable price at all times. Put differently, bank liquidity means banks having money when they need it particularly to satisfy the withdrawal needs of their customers. The survival of deposit money banks depends greatly on how liquid they are, since illiquidity, being a sign of imminent distress, can easily erode the confidence of the public in the banking system and results to run on deposit.

Liquid assets should be marketable or transferable. This means, they are expected to be converted to cash easily and promptly, and are redeemable prior to maturity. Another quality of liquid assets is price stability. Based on this characteristic, bank deposits and short term securities are more liquid than equity investments due to the fact that the prices of the former are fixed than the prices and value of the later (Richard, 2013)

Concept of Profitability

The issue of profitability is a contentious subject that a bank has to consistently face. Profit is the disparity between expenses and revenue over a period of time, normally one year. As explained by Heibati, Nourani and Dadkhah (2009), a business is organic; it survives and grows. Therefore, it is important that a bank earns profit for its long term survival and growth. It is also necessary that enough profit must be earned to maintain the activities of the business to be able to obtain funds for expansion and growth of the bank.

Agbada and Osuji 2013 argued that corporate profit planning remains one of the most difficult and time consuming aspects of bank management because of the many variables involved in the decision, which are outside the control of the bank. It is even more difficult if the bank is operating in a highly competitive economic environment, such as that of Nigeria.

According to Tabari, Ahmadi and Emami (2013) the profitability variable is represented by two alternative measures: the ratio of profits to assets, i.e., the return on assets (ROA) and the returns to equity ratio (ROE). In principle, return on assets ROA reflects the ability of a

bank's asset to generate profit, although it may be biased due to off-balance-sheet activities. ROE indicates the returns to shareholders on their equity and equals ROA times the total assets-to-equity ratio.

Theories of the Relationship between Liquidity and Profitability

A number of theories have been put forward which seek to provide insight into the underlying relationship between liquidity and profitability of deposit money banks. The basic question which the underlying theories attempt to answer is how does liquidity affect profitability in banking?

Osborne, Fuertes and Milne (2012) postulated that higher liquidity is often costly to banks, implying that higher liquidity reduces profitability. However, according to the trade-off theory, higher liquidity may also reduce a bank's risk and hence the premium demanded to compensate investors for the costs of bankruptcy. (Osborne, et al. 2012)

According to conventional corporate finance theories, a bank in equilibrium will desire to hold a privately optimal level of liquidity that just trades off costs and benefits implying a zero relationship at the margin. However, capital requirement imposed by monetary authorities, if they are binding, forces banks to hold liquidity in excess of their private optimal level and hence force banks above their internal optimal liquidity level (Miller, 1995, Bussen et al. 1989).

Furthermore, since bank's optimal liquidity level is likely to vary over the business cycle, typically rising when there are higher expected costs of distress, the relationship between liquidity and profitability is likely to be highly cyclical, becoming more positive during the periods of distress as banks that increase their liquidity improve their profitability (Osborne, et al. 2012). Thus, there may be a positive or negative relationship between liquidity and profitability in the short-run depending on whether a bank is above or below its optimal liquidity level.

Flannery and Rangan (2008) assert that indeed if banks are successful in attaining their optimal liquidity level there may in fact be no short-run relationship at all, since the standard first order conditions imply that any change in liquidity has no impact on profitability. However, the long run, regulatory liquidity requirements may be binding. This implies that higher liquidity only reduces profitability if banks are above their optimal liquidity level, for example due to regulatory requirements or unexpected shock (Flannery and Regan 2008).

In corroboration of the above, Osborne, et al. (2012) opined that banks' optimal liquidity level rises during periods of banking sector distress, since in such conditions the expected cost of bankruptcy rises. Consequently, it is expected that the average relationship between liquidity and profitability across banks will be cyclical. This is because in a distressed environment banks tend to be below their optimal liquidity level, whereas during normal conditions, banks may either meet their optimal capital level or not, in which case the relationship would be

approximately zero, or overshoot, in which case banks can increase profitability by reducing the liquidity level (Osborne, et al. 2012).

A bank with a higher liquidity level has more chances of surviving and improving profitability in the future. Allen and Marguez (2011) argued that this may result in large voluntary liquidity buffer in competitive markets, since the higher liquidity is a more effective guarantee of the bank's solvency and therefore allows the bank to offer more surplus to borrowers. The effect is to increase bank's optimal liquidity level.

Agbada and Osuji (2013) captured the relationship between liquidity and profitability rather succinctly. According to them: *"Maximum safety or in simple language we can say liquidity can be attained only if the banks keep high amount of cash against the deposits they hold. But if they do this, this will not bring profit for the banks. Similarly, if they go the other way round that is they only keep investing and trying to increase the profitability factor then they will have illiquidity problem if customers demand for much cash in a given period".*

Thus, the authors advocated that a good banker should try to reconcile the twin conflicting objectives by actually working out a good portfolio mix. This can be done by analyzing the situation, studying the objectives and therefore choosing a diversified and balanced asset portfolio.

Previous Empirical Studies

The liquidity – profitability trade-off has been of interest to scholars for quite a long time now. The number of empirical studies that have been carried out to ascertain the relationship between liquidity and profitability of deposit money banks has increased. These studies provided the theoretical and analytical framework that supports this work. However, to make the review of the empirical evidence specific to the topic of the study, a special section is devoted to the research carried out on Nigerian banks.

In a study on the determinants of the Tunisia banking profitability for ten banks for the period 1980 to 2000, Naceur (2003) observed that high net interest margin and profitability are likely to associate with banks with high amount of capital and large over-heads. Further, the empirical results of the study also indicated that other determinants such as loans has positive and bank size has negative impact on profitability.

The profitability of European banks during the 1990s was investigated by Goddard et al. (2004) using pooled cross-sectional time-series and dynamic panel models. Their model for the determinant of profitability incorporates size, diversification, risk and ownership type, as well as dynamic effects. They found that despite intensifying competition there is significant persistence

of abnormal profit from year to year. The evidence for any consistent or systematic size-profitability relationship was relatively week.

By calculating the parameters of banks' performance in four groups of profitability, liquidity, efficiency and capital, Heibati et al. (2009) examined and compared the performance of private banks in Iran and Arabic countries of Persian Gulf area. The empirical results from regression analysis of cross-country panel data of the banks showed statistically significant relationship between liquidity and profitability of the banks especially during initial years of their activity.

The effect of liquid asset holdings on the profitability of U.S. and Canadian banks was investigated by Bordeleau et al. (2010). The empirical results from ordinary least squares regression analysis of panel data of the banks suggested that profitability is improved for banks that hold some liquid assets. However, there is a point at which holding-further liquid assets minimizes a bank's profitability, all else equal. Furthermore, the empirical results from the study also indicated that this relationship varies depending on a bank's business model and the state of the economy.

Javaid et al. (2011) analyzed the determinants of top ten banks' profitability in Pakistan over the period 2004 to 2008. They focused on the internal factors only. They used the pooled ordinary least square (POLS) method to investigate the impact of assets, loans, equity, and deposits on one of the major profitability indicators of banks which is return on assets (ROA). The empirical results found strong evidence that these variables have a strong influence on profitability. However, the results showed that higher total assets may not necessarily lead to higher profits due to diseconomies of scale. Also, higher loans contribute toward profitability but the impact is not significant. Equity and deposits have significant impact on profitability.

Imad et al. (2011) studied a balanced panel data set of Jordanian banks for the purpose of investigating the nature of the relationship between the profitability of banks and their liquidity level for ten banks over the period 2001 to 2010. Using two measures of bank's profitability: the rate of return on assets (ROA) and the rate of return on equity (ROE), the results showed that the Jordanian bank's liquidity explain a significant part of the variation in banks' profitability. High Jordanian bank profitability tends to be associated with well-capitalized banks, high lending activities, low credit risk, and the efficiency of credit management. Results also showed that the estimated effect of size did not support significant scale economies for Jordanian Banks.

The relationship between liquidity and the profitability of banks listed on the Ghanaian Stock Exchange was investigated by Lartey and Boadi (2013). The study was carried out on seven of the nine listed banks. The researchers made use of the longitudinal time dimension model. Specifically the panel method time series analysis and profitability ratios were computed

from the annual financial reports of the seven banks. The trend in liquidity and profitability were determined by the use of time series analysis. It was revealed that for the period 2005 to 2010, both liquidity and profitability had a downward trend. The main liquidity ratio was regressed on the profitability ratio. The result revealed that there was a positive and statistically significant relationship between liquidity and profitability of the listed banks.

Empirical Evidence on Nigerian Banks

The empirical evidence on Nigerian banks is reviewed in this sub-section. A study which investigated the relationship between liquidity and profitability of some selected banks and companies quoted in Nigerian Stock Exchange was that of Obiakor and Okwu (2011). The central objective of the study was to examine the nature and extent of the relationship between liquidity and profitability and also to determine whether any cause and effect relationship existed between the two performance measures. Analysis was based on accounts of the banks and the companies for the relevant period. A model of perceived functional relationship was specified and estimated using correlation and regression analysis. The results indicated that while a trade-off existed between liquidity and profitability in the banks with a negative but insignificant impact, the two variables were positively correlated.

Uremadu (2012) carried out a study on the effect of capital structure and liquidity on the profitability of selected Nigerians banks. Time series data for the 1980 to 2006 period was used for the study. The data was analyzed using descriptive statistics and regressive distributed lag (ARDL) model. The empirical results indicated a positive and significant relationship between cash reserve ratio, liquidity ratio, corporate income tax and banks' profitability. On the other hand, there was negative and significant relationship between savings deposit rate, gross national savings, balances with the central bank, inflation rate, foreign private investment and bank profitability.

Ibe (2013) investigated that impact of liquidity management on the profitability of banks in Nigeria. Three banks were randomly selected to represent the entire banking industry in Nigeria. The proxies for liquidity management include cash and short-term fund, bank balances and treasury bills and certificates, while profit after tax was the proxy for profitability. Elliot Rosenberg Stock (ERS) stationary test model was used to test the association of the variables under study, while regression analysis was used to test the hypothesis. The result showed that there is a statistically significant relationship between the variables of liquidity management and profitability of the selected banks.

The study by Kehinde (2013) critically examined the relationship between credit management, liquidity position and profitability of selected banks in Nigeria using annual data of

ten banks over the period of 2006 and 2010. The results from ordinary least squares estimate found that liquidity has significant positive effect on Return on Asset (ROA).

Agbada and Osuji (2013) explored the efficacy of liquidity management and banking profitability performance in Nigeria. Profitability and Return on Capital Employed (ROCE) were adopted as proxy variables. Findings from the empirical analysis were quite robust and clearly indicated that there was a statistically significant relationship between efficient liquidity management and banking performance, and that efficient liquidity management enhances the soundness of the banks.

Adeyinka (2013) examined the effect of capital adequacy on profitability of deposit-taking banks in Nigeria. It sought to assess the effect of capital adequacy of both foreign and domestic banks in Nigeria and their profitability. The study presented primary data collected by questionnaires involving a sample of five hundred and eighteen (518) distributed to staff of banks with a response rate of seventy six percent. Also, published financial statements of banks were used from 2006 to 2010. The finding from the primary data analysis revealed a non-significant relationship but the secondary data analysis showed a positive and significant relationship between liquidity adequacy and profitability of bank. This implies that for deposit-taking banks in Nigeria, liquidity adequacy plays a key role in the determination of profitability. It was discovered that liquidity and profitability are indicators of bank risk management efficiency and cushion against losses not covered by current earnings.

RESEARCH METHODOLOGY

Research Design

This study is quantitative by nature and explanatory by design. Its quantitative nature is hinged on the fact that it carried out a statistical analysis of the panel data of the variables specified in the models. The research is explanatory because it seeks to explain the trade-off or causal relationship between bank profitability and liquidity.. In essence, the intention is to provide a prognosis of the investigated phenomenon with a view to recommending appropriate liquidity management strategy for the banks (Alveston and Skoldberg, 1994).

Hypotheses

$H0_1$: There is no statistically significant relationship between bank liquidity and returns on equity of DMBs.

$H0_2$: There is no statistically significant relationship between bank liquidity and returns to asset of DMBs.

Specification of the Models

Subsequent to hypotheses setting, to provide an analytical basis to test their validation we reduce them to mathematical statements. However, in specifying the mathematical models, we relied on the theories of the link between liquidity and profitability in line with Saleen et al, (2011) and Agbada and Osuji (2013).

The mathematical representations of the functional form that represent our stated hypotheses are expressed as follows:

$ROE_t = F(CRR_t, LTA_t, LAD_t, CTD_t, LNA_t)$ - - (1)

$ROA_t = F(CRR_t, LTA_t, LAD_t, CTD_t, LNA_t)$ - - (2)

where:

ROE_t	=	Return on equity of banks in period t
CRR_t	=	Current ratio i.e. current asset to current liability
LTA_t	=	Liquid assets to total asset ratio
LAD_t	=	Loans and advances to deposits ratio
CTD_t	=	Cash to total deposits ratio
LNA_t	=	Loans and advances to total assets ratio
ROA_t	=	Return on assets of the banks in period t

Equations (1) and (2) are mere mathematical expressions that cannot be estimated in their present forms. Thus, to make them adaptable for regression analysis and estimation, equations (1) and (2) are expressed linearly as follows:

$ROE_t = a_0 + a_1CRR_t + a_2LTA_t + a_3LAD_t + a_4CTD_t + a_5LNA_t + U_t$ (3)

$ROA_t = b_0 + b_1CRR_t + b_2LTA_t + b_3LAD_t + b_4CTD_t + b_5CTD_t + U_t$ (4)

where $a_0 – a_5$, b_0 - b_5 are variables coefficients which were estimated. Ut is the stochastic element representing all other unspecified influence on return on equity and return on asset.

With regards to the algebraic signs of the parameter estimates, the a priori expectations are as follows:

$\frac{\partial ROE_t}{\partial CRR_t} < 0$; $\frac{\partial ROE_t}{\partial LTA_t} < 0$; $\frac{\partial ROE_t}{\partial LAD_t} > 0$; $\frac{\partial ROE_t}{\partial CTD_t} < 0$; $\frac{\partial ROE_t}{\partial LNA_t} > 0$ - (5)

This means that, all things being equal, return on equity is negatively impacted by current ratio, liquid asset to total asset ratio, cash to total deposit ratio, while it is positively impacted by loans and advances to deposit ratio and loans and advances to total asset ratio. The same a priori expectations hold true with respect to return on asset.

Population, Sample Size and Sampling Technique

The population consists of the 22 operational banks in the Nigerian economy. However, for the purpose of the study, the researchers opted for 15 banks which could be regarded as fairly representative of the banking sector.

The banks selected were based on the fact that they have a wide branch network and timely published financial results that are readily available in their website and also posted on the internet. The selected banks are listed below:

1. First Bank
2. UBA Bank
3. Zenith Bank
4. GT Bank
5. Access Bank
6. Diamond Bank
7. Fidelity Bank
8. Sterling Bank
9. Eco Bank
10. Skye Bank
11. Unity Bank
12. Union Bank
13. Mainstreet Bank
14. Stanbic – IBTC Bank
15. Wema Bank

Type and Sources of Data

Panel data of the selected banks were used to carry out the econometric analysis. The data on the profitability and liquidity variables were obtainable from the annual published reports of the DMBs.

Analytical Technique

The analytical technique that was applied to estimate models (3) and (4) is the Ordinary Least Squares (OLS) multiple regression model. According to Koutsouyiannis (1977), OLS is more commonly used of all the regression techniques because of its best, linear, unbiased (blue) properties.

ANALYSIS & RESULTS

Descriptive Analysis

The data presented in Table 1 were extracted from the annual financial statements of the respective banks. The computation of the ratios for each bank is shown as Appendix A. From the Table, the current ratios (current asset to current liability) of the various banks show some distinctive but similar characteristics. Specifically, the Table reveals that the current ratio of some of the banks (First Bank, UBA, Zenith Bank, Access Bank, Diamond Bank, Fidelity Bank, Stanbic-IBTC Bank, Wema Bank) is greater than 1. This means that the current assets of these banks provide more than 100 % coverage for current liability. While this might be a good liquidity management practice it should also be recognized that it implies tying down of investable funds.

The other banks (Sterling, GT, ECO and Skye) had current ratio that approximated close to 100 percent coverage. Only Unity, Union and Mainstreet banks had a lower current ratio of 0.78, 0.63 and 0.79 respectively. From the data, there emerges a discernable pattern of current ratio management of the different banks which can be classified into three categories: those with more than 100 percent coverage of current liabilities, those with close to 100 percent coverage and those with less than 100 percent coverage.

Table 1. Liquidity Ratio, Efficiency Ratio and Profitability

S/N	Bank	Return on Equity	Return to Asset	Current Ratio	Liquid to Asset Ratio	Loans to Deposit	Cash to Deposit	Loans to Asset
1	First Bank	0.10	0.013	1.12	0.96	0.89	0.08	0.65
2	UBA	0.10	0.009	1.04	0.93	0.49	0.33	0.34
3	Zenith	0.09	0.03	1.12	0.93	0.64	0.14	0.47
4	GTB	0.24	0.04	0.99	0.82	0.71	0.32	0.47
5	Access	0.04	0.003	1.14	0.91	0.66	0.09	0.47
6	Diamond	0.06	0.003	1.04	0.86	0.83	0.09	0.60
7	Fidelity	0.07	0.013	1.24	0.93	0.79	0.13	0.56
8	Sterling	0.16	0.013	0.81	0.74	0.46	0.11	0.36
9	Eco	0.13	0.01	0.95	0.86	0.64	0.12	0.58
10	Skye	0.07	0.01	0.94	0.75	0.74	0.08	0.53
11	Unity	0.09	0.01	0.78	0.63	0.69	0.11	0.49
12	Union	-0.43	-0.30	0.64	0.68	0.30	0.19	0.18
13	Mainstreat	0.13	0.027	0.79	0.86	0.15	0.20	0.10
14	Stanbic-IBTC	0.05	0.01	1.19	0.91	0.89	0.12	0.53
15	Wema	-1.52	-0.01	1.08	0.76	0.40	0.23	0.27

Source: Annual Financial Statements of selected Commercial Banks for the Year Ended 2012

The next liquidity management ratio on the Table is liquid to total asset ratio. The pattern of this ratio on the Table reveals the different liquidity management approach of the various banks. There are those (such as First Bank, UBA, Zenith Bank, Access Bank, Fidelity Bank and Stanbic-IBTC Bank) which maintain a very high liquid to total asset ratio of higher than 90 percent. Others such as GT, Diamond Bank, ECO Bank and Mainstreet Bank maintained liquidity ratio that is higher than 80 percent. The others consist of those banks maintaining less than 80 percent, with Union and Unity bringing up the rear with .68 and .63 percents respectively.

From the analysis so far, it can be seen that many Nigerian banks maintain high liquidity ratio. This might be due to one of two reasons; it might be that they adopt a rather conservative approach to liquidity management or due to high cash reserve ratio set by the Central Bank of Nigeria. Although the high liquidity ratio maintained by the banks is good as a buffer against illiquidity and insolvency, but it comes at an opportunity cost of lost returns on tied down investable funds which translate to lower profitability.

The last liquidity management ratio under consideration is cash to total asset ratio. This is the strongest liquidity management ratio because it provides the clearest indication of a bank's ability to meets its cash obligations instantaneously. This is particularly important in a cash-based economy such as that of Nigeria.

From Table 1 above, it can be seen that the cash to total asset holdings of the banks are rather on the low side considering the high cash transactions which take place in the Nigerian economy.

From the Table 1, only UBA and GT Bank had cash to asset ratio of more than 30 percent. The average ratio in the industry hovered between 10 and 20 percent although Diamond Bank had the lowest of 9 percent. The low cash holding of Nigerian banks may be attributed more to incessant bank robbery in the country rather than to strategic liquidity management. In addition, the banks can easily resort to borrowing from the overnight interbank market or resort to the Central Bank of Nigeria to bridge any temporary liquidity challenge. Another possible explanation is the recent move into electronic banking which has curtailed a lot of cash-based transactions. The practice of keeping low cash to asset ratio may however have some salutary effect on the profitability of the banks.

The next group of ratios on the Table is those on efficiency management, that is, loans to deposit ratio and loans to asset ratio. These ratios are fundamental to the profitability of the banks because they are indicators of how efficiently savings mobilized are being utilized. From the Table above, with respect to loans to deposit ratio, First Bank, Diamond Bank and Stanbic IBTC Bank maintain the highest ratio of over 80 percent. They are followed by GT Bank, Fidelity

Bank and Skye Bank with over 70 percent. The banks with the least loans to deposit ratio are Sterling, Wema, Union and Mainstreet with 46 percent, 40 percent, 30 percent and 14 percent respectively.

The next efficiency management ratio is loans to asset ratio. This ratio shows how the banks efficiently utilize their total assets viz-a-viz the deposits they mobilize. The higher the loans to asset ratio the more efficient is a bank. However, if this ratio crosses a certain threshold the bank may face some liquidity problems.

From the Table, it can be seen that the banks with the highest loans to asset ratio are First Bank, Diamond Bank, ECO Bank, Fidelity Bank, Stanbic-IBTC Bank and Skye Bank with 65 percent, 60 percent, 58 percent, 56 percent, 53 percent and 52 percent respectively. On the other hand, the banks with the lowest ratios are Wema, Union and Mainstreet with 27 percent, 18 percent, and 10 percent respectively.

We now turn to the two profitability ratios of return on equity and return on asset. With these two ratios we are able to measure how the inter-mix of the cash management ratios (liquidity) and efficiency management (profitability) produces different trade-off results on profitability for the different banks. Despite the fact that this work does not dwell on empirical determination of the threshold at which liquidity-profitability have either increasing or decreasing functions, but based on the available data we can draw some reasonable inferences.

To make the analysis lucid, the return to equity and return to asset ratios are discussed simultaneously for reasons that will soon become obvious and which hold a lot of policy implications for the purpose of the study.

From Table 1, the trend of return on equity and return on asset reflect some contradictory patterns. For instance, First Bank has a return of equity of 10 percent but only 1 percent for return on asset. This appears to be the standard trend pattern of both ratios for virtually all the banks under study. Specifically, UBA and GT bank have respective returns on equity of 10 and 9 percent, whereas the corresponding returns on asset are 1 and 3 percent respectively.

Similarly, Access, Diamond Bank and Fidelity Banks with returns on equity of 4, 6 and 7 percent respectively could only produce return on asset of 0.3, 0.3 and 1 percent respectively. This trend pattern runs through the industry so there is no need to continue representing the recurring statistic.

We can now draw some inferences from the data presented and discussed based on Table 1 above. From the Table, it is quite apparent that the different banks have different portfolio mix of cash management ratios as well as efficiency management ratios. However, one feature that seems to be consistent is the rather low return on asset viz-a-viz return on equity.

Although banks usually have asset base that outstrip shareholders equity but the disparity between both returns still appears rather wide.

It may be inferred that the current liquidity management strategy adopted by the banks might be one in which the threshold of optimized return on equity has not been reached while that of maximizing return on asset has been passed. There is therefore a need for the banks to take a closer look at the current liquidity management strategy for possible re-evaluation and redesign in order to produce better results with respect to return on asset. The current practice is not optimizing their operating assets despite the impressive annual profits they may be positing.

Regression Analysis

The models specified for the study were estimated using Ordinary Least Squares (OLS) multiple regression. The regression analysis was carried with e-views version 8 statistical software. The panel data were obtained from the financial statements of the observed Deposit Money banks. The first result is that of return on equity as the dependent variable, while the second one is that of return on asset.

Model 1: Liquidity and Return on Equity

Table 2. The Regression Result of Model 1

Dependent Variable: ROE
Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CRR	-3.663095	1.062026	-3.449157	0.0073
CTD	-0.11944	.0590362	-2.023172	0.0265
LAD	1.940679	1.008901	1.923557	0.0446
LNA	1.063313	0.421623	2.521951	0.0433
LTA	-4.770767	1.477907	-3.228056	0.0104
C	-1.521135	0.738801	-2.058924	0.0696
R-squared	0.750281			
Adjusted R-squared	0.685992			
S.E. of regression	0.318940			
F-statistic	5.346983	Durbin-Watson stat		1.510643
Prob(F-statistic)	0.035320			

The estimated regression result presented in Table 2 is satisfactory in terms of the algebraic signs of the coefficients as they conform to our a priori theoretical expectation. Specifically the estimated equation shows that current ratio, liquid ratio and cash to asset ratio are decreasing functions of return on equity while loans to deposit ratio and loans to asset ratio are increasing functions of return on equity.

Numerically, a percentage increase in current ratio, liquidity ratio and cash to deposit ratio will affect return on equity negatively by 3.66 percent, 4.77 percent, and 0.12 percent respectively. Conversely, a percentage increase in loans to deposit ratio and loans to asset ratio would affect return on equity positively 1.94 percent and 1.06 percent respectively.

The statistical characteristics of the equation are quite strong. All the coefficient estimates are statistically significant at the 5 percent level. This is because the prob (t-static) of the coefficient estimates are less than 0.05 which by inference from statistical decision theory is indicative of statistical significance.

The R^2, coefficient of determination, of 0.7503 is quite high. It indicates an excellent goodness of fit of the estimated regression line. This means that if we plot the actual data to the estimated regression line most of the data will cluster around it. Furthermore, the R^2 shows that 75.03 percent of the total variation in returns on equity is explained by the joint influence of independent variables. The balance 24.97 percent is explained by other variables not captured by the model which is why the stochastic error term was specified in the econometric model.

The overall regression result is statistically significant at the 5 percent level. This assertion is based on the F-statistic with a value of 5.3470 and probability (F = statistic) which is less than 0.05 and thus is statistically significant in line with statistical decision theory.

The Durbin-Watson statistic of 1.5106 is less than 2 and greater than the R-square of 0.7503 which according econometric assumption indicates that the result is free from autocorrelation between successive error terms. Thus, the t-
statistic, R^2 and F- statistic are statistically reliable and the entire regression result is acceptable.

Given that the F-statistic is statistically significant at the 5 percent level, we reject the null hypothesis of the statistical insignificance of the joint coefficient estimates. In effect, we accept the alternative hypothesis that there is a
statistically significant relationship between current ratio, liquid ratio, cash ratio, loans to deposit ratio, loans to asset ratio, and return on equity.

4.2.2 Model II: Liquidity and Return on Asset

Table 3. The Regression Result of Model 11

Dependent Variable: ROA
Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CRR	-0.2693	0.0683	-3.940	0.0117
CTD	-0.1302	0.3181	-0.4094	0.6918
LAD	0.3444	0.3664	0.9401	0.3717
LNA	0.5534	0.4831	1.1453	0.2816
LTA	-1.0580	0.3734	-2.8331	0.0299
C	-0.2786	0.1866	-1.4923	0.1698
R-squared	0.4845			
Adjusted R-squared	0.4126			
S.E. of regression	0.0805			
F-statistic	1.1247	Durbin-Watson stat		1.6340
Prob(F-statistic)	0.4125			

The estimated regression result presented in Table 4.3 is also satisfactory as per the algebraic signs of the coefficients which all conform to our a priori theoretical expectation. From the result, current ratio, liquid ratio and cash ratio are negatively related to return on asset, while loans to deposit ratio and loans to asset ratio are positively related to return on asset.

In numeric terms, a percentage increase in current ratio, liquid ratio and cash ratio will have 0.27percent, 1.06 percent and 0.13 percent negative impact on returns on asset. On the other hand, a percentage increase in loans to deposit ratio and loans to asset ratio will have 0.34 percent and 0.55 percent positive impact on returns on asset.

However, the statistical characteristics of estimated model 2 are weak. Only the coefficient estimates of current ratio and liquid ratio are statistically significant because their respective probability [t-statistic] of 0.01 and 0.03 are less than 0.05. The coefficient estimates of cash ratio, loans to deposit ratio and loans to asset ratio are statistically significant because their respective prob. (t – statistic) of 0.69, 0.37 and 0.28 are all greater than 0.05.

The R^2, coefficient of determination, of 0.4846 is low. It is an indication of a poor goodness of fit of the estimated regression line. Specifically it shows that of the total variation in returns to asset only 48.46 percent is explained by the joint influence of the independent variables. The remaining 51.54 percent is explained by the stochastic error term.

The F-statistic of 1.1245 has a prob. (F-statistic) of 0.41 which is greater than 0.05, thus making it statistically insignificant in line with statistical decision theory. The Durbin-Watson

statistic of 1.6340 is less than 2 and greater than the R^2 of 0.4845 which indicates that the result is free from autocorrelation as stipulated by econometric assumption of ordinary least squares.

Given that the F-statistic is statistically insignificant at the 5 percent level we cannot reject the null hypothesis of the statistical insignificance of joint coefficient estimates. In effect, we accept the null hypothesis that there is no statistically significant relationship between current ratio, liquid ratio, cash ratio, loans to deposit ratio, loans to asset ratio and return on asset.

DISCUSSION OF THE EMPIRICAL RESULTS

The empirical results of the regression analysis are quite fascinating for one outstanding reason; whereas the relationship between return on equity and the independent variables is statistically significant, that between return on asset and independent variables is statistically insignificant.

In essence, while model I is statistically significant model II is statistically insignificant. The natural question is why?" To answer the question we will draw inference from the empirical results.

For one, the results show that liquidity management of commercial banks have a significant impact on the profitability of returns to shareholders but has a weak impact on the profitability of returns to asset. These results suggest that despite the huge profit declared by Nigerian commercial banks annually; their liquidity management does not optimize the use of assets.

Drawing from the above, we can infer that the current liquidity management approach of commercial banks need to be evaluated and redesigned to increase their profitability beyond present levels. Although there is a need to be cautious in the redesign of the banks liquidity management because it should not over focused on profitability at the expense of the all important issue of liquidity.

We now come to the main thrust of this research work: the trade off between profitability and liquidity. To achieve this we go back to empirical results. Despite the noticeable disparity between returns on equity and return on asset, the performance of the liquidity ratio and efficiency management ratios lend evidence to the trade off hypothesis between liquidity and profitability.

In both model I and model II that were estimated, the empirical results were emphatic. The liquidity management variables (current ratio, liquid to asset ratio, and cash to deposit ratio) had negative impact on profitability, whereas the efficiency management ratios (loans and advances to total deposits and loans and advances to total asset) had positive impact on profitability.

We thus conclude that the liquidity-profitability trade-off is a very challenging issue facing DMBs in Nigeria. Thus, the research problem of this study has been thoroughly investigated and the arising hypothesis validated. The subsequent recommendations made in the next section should, hopefully, provide bankers and policy makers with some insights on how to tackle the problem.

SUMMARY

The major findings made from conducting the study are outlined below:

(i) Nigerian banks adopt a tight liquidity approach in which there is more than average of current assets over current liability. Also the deposit to asset ratio is higher than the loan to asset ratio.

(ii) The empirical results showed that there is a negative and significant relationship between current ratio, liquid ratio, cash ratio and return on equity.

(iii) There is a positive and significant relationship between loans to deposit, loans to asset ratio and return on equity ratio. Thus there is a statistically significant relationship between liquidity and return on equity (the proxy for profitability).

(iv) The liquidity-profitability trade-off is a very challenging issue facing DMBs in Nigeria.

RECOMMENDATIONS

Based on the critical evaluation of the findings, made in this study, we hereby make the following recommendations with the sincere conviction that they will help to reduce if not totally eradicate the problems associated with liquidity management and profitability in deposit money banks in Nigeria.

(i) The liquidity management of Nigerian banks should be more proactive than reactive as it is presently practiced. The current conservative approach of keeping to a tight liquidity management, although producing good profitability in terms of return on equity, but only produces modest profitability in terms of return on asset.

(ii) Since the survival of deposit money banks depend on liquidity management and profitability, they should not solely concentrate on the profit maximization concept but also adopt measures that will ensure effective liquidity management. The measures will help to minimize or avoid cases of excessive and deficient liquidity as their effects are negative.

(iii) Instead of keeping excessive liquidity as a provision for unexpected withdrawal demands of the customers, the deposit money banks should find it reasonable to adopt other measures of meeting such requirements, which can include borrowing and

discounting bills. In addition, the surplus funds of the commercial banks should be seasonally invested in short-term instruments of the money market.

(iv) The deposit money banks should create a customer forum where their customers will be educated on varieties of deposits and the operational requirements of each of them. A situation where the customers operate any of the deposits as required, the deposit money banks should be able to estimate the liquidity level to be maintained.

(v) The Central Bank should maintain a flexible minimum monetary policy (MPR) or discount rate so as to enable the deposit money banks take advantage of the alternative measures of meeting the unexpected withdrawal demands, and reduce the tendency of maintaining excess idle cash at expense of profitability.

(vi) Deposit money Banks should schedule the maturity of their secondary reserve assets to correspond to the period in which the funds will be needed.

(vii) For the fact that the monetary policies of CBN grossly affect liquidity management of the deposit money banks, CBN should take the interest of the later into consideration while establishing and implementing these monetary policies in general and the liquidity ratio in particular. To achieve this feat, CBN is expected to create a forum whereby its policy makers and the management of deposit money banks interact and dialogue for acceptable monetary policies.

CONCLUSION

Astute bank management entails delicate balancing of the liquidity and profitability trade-off. This is because excessive liquidity reduces profitability while excessive liquidity risks exposure, in pursuit of maximum profitability could lead to the insolvency of a bank. This study was carried out to empirically examine the relationship between liquidity and profitability of 15 Nigerian banks. The empirical results indicated that there is statistical significant relationship between profitability and liquidity when return on equity is used as a measure of profitability but the relationship becomes insignificant if profitability is proxied by return on asset. Thus, the liquidity management of Nigerian banks maximizes returns to shareholders but is producing less than optimal profitability in terms of efficient utilization of assets.

LIMITATIONS OF THE STUDY

This study was conducted using panel data extracted from the financial statements of the surveyed banks. A major limitation of the study was the difficulty in getting timely and relevant data due to the delays by banks in publishing their financial statements. Also, attempts by some banks to window- dressed their accounts for statutory reasons may impact negatively on the

reliability of the data. Lastly, bank financial statements are published on annual basis. This limits the number of observations available and impact adversely on the degree of freedom in a multiple regression analysis of this nature. With improvement in data quality and availability, further research would be necessary in order to re-examine the major hypothesis contained in this study.

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APPENDIX

DATA OF LIQUIDITY MANAGEMENT AND PROFITABILITY OF INDIVIDUAL BANKS, 2010-2012

STANBIC-IBTC		Return on Equity	Current Ratio	Liquid to Asset Ratio	Loans to Deposit	Cash to Deposit	Cash to Asset	Return to Asset
	2012	0.08	1.12	0.93	0.81	0.2	0.48	0.01
	2011	0.04	1.2	0.93	0.81	0.1	0.56	0.01
	2010	0.03	1.25	0.87	1.07	0.05	0.55	0.01
		0.05	1.19	0.91	0.89	0.11	0.53	0.01
WEMA	2012	-3.9	0.98	0.75	0.42	0.11	0.3	-0.02
	2011	-0.68	1.05	0.75	0.45	0.15	0.3	-0.02
	2010	0.02	1.2	0.79	0.34	0.424	0.22	0.01
		-1.52	1.07	0.76	0.40	0.228	0.27	-0.01

UBA	2012	0.29	1	0.92	0.57	0.4	0.3	0.02
	2011	-0.01	1.03	0.95	0.44	0.3	0.34	-0.001
	2010	0.03	1.1	0.93	0.48	0.31	0.38	0.01
		0.10	1.04	0.93	0.49	0.33	0.34	0.009
FIDELITY	2012	0.11	1.19	0.94	0.62	0.16	0.48	0.02
	2011	0.01	1.2	0.94	0.67	0.15	0.51	0.01
	2010	0.08	1.34	0.92	1.07	0.08	0.71	0.01
		0.06	1.24	0.93	0.78	0.13	0.57	0.013
UNITY	2012	0.15	0.78	0.68	0.75	0.15	0.51	0.02
	2011	0.05	0.86	0.6	0.67	0.1	0.49	0.01
	2010	0.07	0.71	0.61	0.66	0.08	0.48	0.01
		0.09	0.78	0.63	0.69	0.11	0.49	0.013
MAINSTREAM	2012	0.35	1.14	0.9	0.22	0.19	0.11	0.08
	2011	-0.01	0.9	0.8	0.14	0.29	0.07	-0.01
	2010	0.06	0.35	0.88	0.08	0.11	0.13	0.01
		0.13	0.79	0.86	0.14	0.19	0.10	0.027
STERLING	2012	0.15	0.76	0.7	0.49	0.214	0.39	0.01
	2011	0.17	0.66	0.61	0.4	0.09	0.32	0.01
	2010	0.15	1	0.9	0.5	0.04	0.38	0.02
		0.15	0.80	0.73	0.46	0.11	0.36	0.013
UNION	2012	0.05	0.35	0.69	0.28	0.29	0.15	0.01
	2011	-0.43	0.83	0.66	0.36	0.21	0.17	-0.09
	2010	-0.83	0.73	0.69	0.27	0.08	0.21	-0.83
		-0.40	0.63	0.68	0.30	0.19	0.18	-0.30
SKYE	2012	0.05	1.04	0.75	0.75	0.12	0.53	0.01
	2011	0.06	1.03	0.75	0.76	0.06	0.55	0.01
	2010	0.09	0.76	0.76	0.7	0.07	0.5	0.01
		0.06	0.94	0.75	0.73	0.083	0.53	0.01
ACCESS	2012	0.08	1.01	0.89	0.45	0.11	0.34	0.01
	2011	0.06	1.18	0.92	0.78	0.05	0.53	0.01
	2010	-0.02	1.22	0.92	0.76	0.13	0.55	-0.01
		0.04	1.14	0.91	0.66	0.09	0.47	0.003
DIAMOND	2012	0.3	0.9	0.79	0.68	0.09	0.51	0.04
	2011	-0.19	1.16	0.91	0.93	0.04	0.65	-0.04

	2010	0.06	1.07	0.88	0.87	0.14	0.65	0.01
		0.06	1.04	0.86	0.82	0.09	0.60	0.003
ECOBANK	2012	0.13	0.95	0.85	0.74	0.13	0.58	0.01
	2011	0.14	0.97	0.88	0.58	0.12	0.57	0.01
	2010	0.11	0.93	0.86	0.59	0.11	0.6	0.01
		0.13	0.95	0.86	0.63	0.12	0.58	0.01
GT BANK	2012	0.31	0.96	0.8	0.67	0.28	0.45	0.05
	2011	0.22	0.91	0.78	0.67	0.35	0.44	0.03
	2010	0.18	1.09	0.89	0.78	0.35	0.52	0.03
		0.23	0.98	0.82	0.71	0.33	0.47	0.036
FIRSTBANK	2012	0.18	1.1	0.94	0.78	0.12	0.61	0.02
	2011	0.05	1.15	1	0.8	0.08	0.6	0.01
	2010	0.08	1.11	0.94	1.09	0.05	0.74	0.01
		0.10	1.12	0.96	0.89	0.083	0.65	0.013
ZENITH BANK	2012	0.06	1.16	0.95	0.61	0.17	0.45	0.04
	2011	0.12	1.12	0.93	0.68	0.13	0.48	0.02
	2010	0.1	1.1	0.91	0.64	0.12	0.49	0.02
		0.09	1.13	0.93	0.64	0.14	0.47	0.027

Sources: Annual Financial Statements of the selected Commercial Banks for the Year Ended 2010-2012