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The Linear Effect of Bank Liquidity on Profitability in Selected African Economies.
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TABLE OF CONTENTS

AUTHORS **PAGI**

Oyebola Fatima Etudaiye-Muhtar[1]; Dayo Bamigbade; Temitope O. Fagbemi and Abdulazeez A. Abdurraheem: The Linear Effect of Bank Liquidity on Profitability in Selected African Economies. 4

Adedeji Oluwaseun ADEWUSI: Attitude of Trading Secondary School Students towards School Activities in Ibadan Metropolis 2

Isinkaye, Kehinde Abiodun: Assessment of Democratic Promotion by International Institutions 4

ABDULKADIR, Rihanat Idowu; RAJI, Jimoh Olajide[b] and BADRU Bazeet Olayemi[b]: Foreign Portfolio Investment and Stock Market Performance in Nigeria

Soluade, Zabur Olayiwola and Adeshola Abimbola Toyin: Social Media Degrading Value Systems among the Youths in Ogun State

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THE LINEAR EFFECT OF BANK LIQUIDITY ON PROFITABILITY IN SELECTED AFRICAN ECONOMIES

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Abstract

Given the importance attached to sound liquidity management in the banking industry, this paper investigates the effect of bank liquidity on profitability. The study employs the bankruptcy cost and risk-return hypotheses to examine the linear effect of bank liquidity on bank profit. Annual bank-specific data from commercial banks in Kenya, Nigeria and South Africa, for the period 2000-2014, are used in the study. The two-step system generalised method of moment's technique of analysis, an instrumental variable technique that addresses issues such as endogeneity, reverse causality and auto-correlation, is used for the investigation. The results revealed a statistically significant and positive relationship between liquidity and bank profit indicating the applicability of the bankruptcy cost hypothesis. This implies that banks in the study benefit from reduced financial distress and funding costs thereby increasing profits. The study thus recommends that commercial banks in the selected countries hold higher levels of liquidity to mitigate the risk of failure and increase profit.

Keywords: bankruptcy cost, endogeneity, liquidity risk, profitability
JEL Code: G21, G32, G33

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1. Introduction

Basel Commission on Banking Supervision (BCBS) (2010) defines liquidity a the "ability of a bank to fund increases in assets and meet obligations as they com due without incurring unacceptable losses." The risk associated with the inabilit of a bank to meet these obligations is what is termed as liquidity risk which, ma be decomposed into funding and market liquidity risks (Decker, 2000, Musemb Ali & Kingi, 2016). Funding liquidity risk is defined as the inability of the bank t meet its obligation as they fall due as a result of being unable to sell assets / obta adequate funding sources. It may also be referred to as the risk associated with bank not being able to meet the expected and unexpected current and future ca flows and collateral needs without affecting either daily operations or the financi conditions of the bank. Market liquidity risk is the risk associated with the inabili to easily offset specific liabilities without a reduction in market prices due to mark imperfections (Fu, Lin & Molyneux, 2016; Shen, Chen, Kao, & Yeh, 2009).

The financial crisis of 2007 highlighted the importance of liquidity risk manageme and liquidity in financial markets (Matz, 2008; BCBS, 2010). The US subpri mortgage crisis of 2007/2008, with its global contagion effect, led to a dry up liquidity in global financial markets, banks inclusive (Baur, 2012; Cornett, McN Strahan, & Tehranian, 2011; Mebounou, Karan & Dannon, 2015). Consequen banks faced with insufficient liquidity had to contend with the problem of accessi funds without it affecting the profitability of their operations (Shen et al., 200 Shen et al. (2009) identified that banks' failure to consider the amount of liquid needed in satisfying contingent obligations was one of the reasons they fou themselves in uncomfortable positions. The resultant effect was that when crisis happened, the banks were unable to handle the ripple effects that occur to the extent that some banks had to go into mergers acquisitions or even outri failure (Bordeleau & Graham, 2010; Moussa, 2015; Singh & Sharma, 2016) addition, Cabral (2013) argued that one of the causes of the financial crisis the high level of liquidity mismatch between bank assets and liabilities such banks paid a high premium for liabilities from low yielding liquid assets. This redu the profitability of the banks because the high profits prior to the crisis were achie through balance sheet expansion and growing default, liquidity, and term mismatches between assets and liabilities. Accordingly, banks' financial leve rose as they became less liquid, setting the conditions for a systemic bank crisis.

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In the aftermath of the crisis, one of the policy decisions taken by most regulatory authorities was that banks should increase the portion of their liquid assets to meet obligations as they fall due. For instance in Nigeria, there was a reduction in cash reserve ratio from 4% to 2 % and statutory liquidity ratio was reduced from 40% to 30% by the Central Bank of Nigeria to tackle the problem of illiquidity in the banking system (Soludo, 2009). This action increased the amount of cash in the system and improved the liquidity position of banks.

On the international level, the need for common measures and standards for liquidity risk is observed in the introduction and ongoing work of the Basel Committee on Banking and Supervision (BCBS) of 2010.[1] Specifically, pillar 2 of the Basel accord focuses on supervisory review by providing improved tools for regulating the banking system especially as it relates to risk management. One of such is the requirement that financial institutions maintain enough cash reserves to adequately protect them from risks incurred in their operations (an example is liquidity risk). Hence, the policy decision of a decrease in cash reserve and statutory liquidity ratio not only ensures that banks have sufficient liquidity to sustain their operations it also ensures the stability of the financial system, thus highlighting the importance of adequate liquidity risk management.

Liquidity risk affects banks in several ways. One of such is bank profitability. The second effect is on bank reputation where customers lose confidence in a bank that is unable to meet its obligation when they fall due. Third, banks may be subject to regulatory penalties when they fall short of regulatory liquidity requirements (Jenkinson, 2008). Nonetheless, in the absence of regulations and considering the trade-off relationship between bank profitability and liquidity, most banks would rather hold liquid assets that maximises bank profits. This position would ultimately put the banks and financial system in serious problem given the systemic importance of banks in the economy.[2] In addition, risk management structure is constantly changing given the various advances in technology and wide range of financial products available in both money and capital markets (Akhtar, 2007; Ibiam & Chinedu, 2017). This paper therefore focuses on funding liquidity risk because extant literature in the African setting do not give enough attention to the liquidity position of banks and its effect on bank profitability. The area of concern of most literature is on credit and operational risk and determinants of bank profitability

[2] The BCBS provides a framework for dealing with the different risks inherent in the banking system. Some of these include systemic risk, liquidity risk, operational risk among others.

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To carry out the investigation in this study, we make use of bank-specific factors that affect profitability over the period 2000 to 2014 in three top African bank-based economies. These countries are Kenya, Nigeria and South Africa. We employ an instrumental variable technique to take care of the dynamism, endogeneity and unobservable fixed effects inherent in our data. Our results indicate that liquidity risk management contributes significantly to profits in the selected countries. The sections in this study are structured as follows: Section 2 covers theoretical framework upon which the study is built. Section 3 provides an insight into data, model, variables and method of analysis employed in the study. Section 4 discusses the results while Section 5 concludes the study with relevant policy implications.

2. Theoretical Framework

The theoretical explanation for the linear relationship between bank liquidity and profitability may be explained with either the expected bankruptcy cost hypothesis (EBCH) or the risk return trade-off hypothesis (RRTH). The EBCH asserts that banks that hold more liquid assets have advantageous positions in funding market with symmetric information. This position reduces financing costs and increases profits (Bordeleau & Graham, 2010). Furthermore, Morris and Shin (2016) show that the probability of bank default due to illiquidity reduces when banks increase their liquidity ratio. These arguments depict a positive effect of liquidity on bank profits. The RRTH explains that maintaining high liquid ratios to meet up with liquidity requirements when it arises has an opportunity cost to the bank in terms of alternative investment opportunities for the liquid assets and cost of maintaining the increased ratio (Anees, 2012). Consequently, and given the low return attributable to holding high levels of liquid assets as indicated by the RRTH, negative effect is likely to occur. The positive and negative effect explained by the EBCH and RRTH ultimately indicates that a non-linear relationship between liquidity and bank profit is possible. This comes up when increased bank liquid assets improve bank earnings via the EBCH. However, when the marginal benefit of holding additional liquid assets exceeds the opportunity cost of their low return the negative effect starts to set in. This implies that further holding of liquid assets reduces banks' profits (Bordeleau & Graham, 2010). However, this study examines only the linear relationship between bank profitability and liquidity. The variable description in Section 3.3 discusses empirical evidences of the relationship in detail

[3] The assumption here is that such banks hold minimal amount of liquidity that maximizes profit. By so doing, they may be unable to meet up with obligations when they fall due

[4] For example, see Flamini, Mcdonald, and Schumacher (2009); Kargi (2011); Kithinji (2010); Kolapo, Ayeni, and Oke (2012); Obamuyi (2013); Ongore and Kusa (2013)

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3.0 Data and Methods

3.1 Data

Our sample consists of commercial banks in three selected African countries namely Kenya, Nigeria and South Africa. These countries have the most developed banking sector on the continent specifically for the period of this study (Mlachila et al., 2013).[4] Annual bank-specific data are extracted from consolidated statements from Bankscope for the period 2000 to 2014 to remove duplicate information. Following the method of Dietrich and Wanzenried (2011), we include only listed commercial banks and exclude investment banks, central banks and investment houses. We ensure that only banks with at least three-year observations are included in the sample to guard against small cross-sectional variations (Vithessonthi, 2016). The final sample comprises of an unbalanced panel of 37 banks because not all banks enter the sample at the same time, besides issues of mergers and acquisitions are considered.

3.2 Econometric Specification

To investigate the effect of bank liquidity on bank performance, we model bank performance as a function of bank-specific factors in a multivariate unbalanced panel regression form shown in Equations 1 and 2. The profitability variables are one period lagged to capture the persistence of profits and the effect of past profit performance on current performance.

$$ROA_{i,t} = ROA_{i,t-1} + LONTASS_{i,t} + ETA_{i,t} + LLRGL_{i,t} + LNTOT_{i,t} + SQLNTOT_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$ROE_{i,t} = ROE_{i,t-1} + LONTASS_{i,t} + ETA_{i,t} + LLRGL_{i,t} + LNTOT_{i,t} + SQLNTOT_{i,t} + \varepsilon_{i,t} \quad (2)$$

where i = individual bank, t = year, ε is the error term. All other variables are described in Table 1.

3.3 Variable Description

To determine the linear effect of bank liquidity on profitability, we employ two measures of profitability as the dependent variable and a set of bank-specific independent variables established in literature to affect bank profitability. Table 1 presents a summary of the variables, description, source and *a priori* expectations. This study adopts two measures for the dependent variable as well as the main independent variable of interest.

[5] To support this claim, we obtained values for access to banking services from World Development Indicators (WDI) 2014 which revealed that the number of bank branches per 100,000 adult were 10.96, 5.72 and 5.56 for South Africa, Kenya and Nigeria respectively. This is against 2.99, 4.48 and 4.34 for Uganda, Egypt and Rwanda in that order. Similarly, the percentages of people with a bank account were 68.77, 55.20 and 44.17 for South Africa, Kenya and Nigeria respectively. Values for Uganda, Egypt and Rwanda were 27.78, 13.65 and 38.14 in that order. [6] The choice of period is guided by data availability.

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Dependent Variable:

The dependent variables are the return on assets and return on equity. These two variables capture differences that may occur in assets and equities acquired during the years. The return on assets indicate the amount of profit generated from banks assets by its management while return on equity reflects profit made from shareholders equity.

Independent Variables:

1. Liquidity: This is the main independent variable of interest and is measured as total loans to total asset (LONTASS). The variable focuses on liquidity on the assets side of a bank's statement of financial position. For robustness check, we use liquid assets to total deposits and borrowing (LATOBOR) to capture the liquidity variable. Unlike LONTASS, LATOBOR captures the liquidity position of both the asset and liability side of a bank's statement of financial position. There are two positions on the effect of liquidity on bank profit. On the one hand, Demirguc-Kunt, Laeven, and Levine (2003) argue that banks with higher level of liquid assets have lower profits than banks with lower liquid levels. This argument is based on banks not having the required level of liquidity to meet due obligations consequently leading to bank failure. Therefore, to avoid failing, a bank would hold higher amounts of liquid assets which can be quickly converted to cash. However, liquid assets are generally linked with lower rates of return. This position implies a negative effect of bank liquidity on profit. On the other hand, Bordeleau and Graham (2010) using the bankruptcy cost hypothesis assert that increase in the level of a bank's liquid asset decreases the possibility of default and the bank is viewed as being safe. Such banks benefit from a superior perception in funding markets, reducing their financing costs and increasing profitability. For this reason, the holding of liquid assets should have a positive effect on bank profit. The two different positions of the effect of liquidity on profit thus make the effect ambiguous.

2. Control Variables: Control variables that also affect bank liquidity are added to the regression model. These include:

   i. *Capital strength*: We measure this as the ratio of equity to total assets as against a risk based measure suggested by Basel II and Basel III because of the unavailability of the data for most banks (Dietrich & Wanzenried, 2014, Lee, Growe & DeBruine, 2015). According to the capital buffer theory, banks build up capital to guard against liquidation risk (Ahmad, Koh & Shaharuddin, 2016;

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Marcus, 1984; Milne, 2002). This action has the potential to increase expected profit by increasing banks credit worthiness which reduces costs related to financial distress costs and funding (Kosmidou, 2008). Furthermore, higher equity to total assets ratio indicates a lower need for external funding which also increases profits. Thus, a higher ratio of equity to total assets would imply more bank profit (Barth, Nolle, Phumiwasana, & Yago, 2003; Djalilov & Piesse, 2016; Kosmidou, Tanna, & Pasiouras, 2005).

ii. *Credit risk*: The ratio of loan loss reserves to gross loan is used to capture credit risk. A higher (lower) credit risk may reduce (increase) bank performance (Anees, 2012; Cooper, Jackson, & Patterson, 2003; Dietrich & Wanzenried, 2014). This occurs when banks are exposed to highly risky loans which may go unpaid ultimately having a negative impact on bank profit. For this reason, we expect an inverse relationship between credit risk and bank performance.

iii. *Size*: In the presence of significant economies of scale (increased operational efficiency), cost differences for banks may result in bank profit and size having a positive relationship (Alharbi & Alharbi, 2017; Dietrich & Wanzenried, 2014; Goddard, Molyneux, & Wilson, 2004). The economies of scale are generally applied to costs related to information gathering and processing. Furthermore, the ability of large banks to raise cheap capital increases the profit of such banks as argued by Dietrich and Wanzenried (2014) and Shuremo (2016). Nonetheless, banks that become too big may be faced with diminishing returns due to bureaucratic and management problems (Athanasoglou, Brissimis, & Delis, 2008; Demirguc-Kunt et al., 2003). The negative effect resulting from this position captures the non-linear relationship between bank size and profitability. Following previous studies, we use the natural logarithm of total assets to proxy size and the square of same to capture the non-linear effect (Athanasoglou et al., 2008; Demirguc-Kunt et al., 2003; Goddard et al., 2004).

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Table 1: Variable Definition

Variable	Description	Source	A priori Expectation
Profitability 1 (ROA)	Measured as the return on assets	Bankscope	
Profitability 2 (ROE)	Measured as the return on equity	Bankscope	
Liquidity 1 (LONTASS)	Measured as ratio of total loans to total assets	Bankscope	+/-
Liquidity 2 (LATOBOR)	Measured as ratio of liquid assets to total deposits and borrowings	Bankscope	+/-
Capital Strength (ETA)	Measured as the ratio of equity to total assets	Bankscope	+
Credit Risk (LLRGL)	Measured as the ratio of loan loss reserves to gross loan	Bankscope	-
Size (LNTOT)	Measured as the natural logarithm of total assets	Bankscope	+
Non-linear Size (SQLNTOT)	Measured as the square of natural logarithm of total assets	Bankscope	-

3.4 Method of Analysis

We employ the instrumental variable technique of Blundell and Bond (1998, 2000) i.e. the two-step system generalised method of moments (GMM). This method addresses issues that relate to the persistence of the dependent variable, endogeneity and autocorrelation that may arise due to the inclusion of the lagged dependent variable in the equation. In this study, we consider liquidity as an endogenous determinant of bank profitability because of reverse causality between it and bank profit. In addition, the GMM technique yields consistent coefficient estimates over other methods such as the ordinary least squares and generalised least squares methods (Delis & Kouretas, 2011; Dietrich & Wanzenried, 2014). To guard against the influence of outliers, we run the GMM regression with robust standard errors (Frank & Goyal, 2009; Verardi & Croux, 2009). Following Roodman (2009), we include year dummies to control for unobserved time specific effect. To validate the regression estimates, we report Arellano and Bond AR(1) and AR(2) test statistics to test for the absence of first and second order serial correlation in the first-differenced residuals. Instruments are valid only when there is no second order serial correlation in the residuals of AR (2) (Arellano & Bover, 1995; Roodman, 2009). We also report Sargan test for overidentifying restrictions and absence of correlation between the error term and the instruments used in the equation.

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4. Results and Discussion

4.1 Descriptive Statistics

Table 2 presents the descriptive statistics of the variables employed in this study. The return on equity is observed to have a higher variability around the mean (22.99%) than the return on assets (1.77%). This implies that the ROE is more volatile than the ROA which may be due to the unpredictable nature of equities in the stock market. The higher mean of LONTASS at 50.67% over that of LATOBOR supports the use of LONTASS as the main independent variable and the use of LATOBOR for robustness whose mean is 28.21%. To prevent the influence of outliers in the regression estimates which may be observed from the minimum and maximum values, we report robust standard errors following the procedure of Frank and Goyal (2009) and Verardi and Croux (2009).

Table 2: Summary Statistics

Variable	Observation	Mean (%)	Standard Deviation (%)	Minimum (%)	Maximum (%)
Return on Assets (ROA)	276	2.126	1.771	-8.05	6.34
Return on equity (ROE)	276	16.099	22.986	-209.03	64.25
Loan to total assets (LONTASS)	281	50.668	16.059	4.67	81.6
Liquid assets to total borrowing (LATOBOR)	275	28.206	28.206	5.36	132
Equity to Total Assets (ETA)	281	12.463	5.344	-12.08	29.67
Loan loss reserve to gross loan (LLRGL)	275	4.319	4.771	0.19	43.64
Size (LNTOT)	281	7.634	2.072	3.55	11.75
Square of size (SQLNTOT)	281	62.559	33.430	12.57	138.06

Source: Authors' computation from data described in Section 3.1

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4.2 Pairwise Correlation Analysis

The bivariate relationship between variables in the models is examined using th pairwise correlation analysis with the results reported in Table 3. This is done t determine the direction and strength of the relationship between the variable Furthermore, the correlation analysis helps to detect the presence of multicollinearit among the regressors in the model. According to Cohen, Cohen, West, and Aike (2013), coefficients with values less than 0.5 signifies low correlation and r problem of multicollinearity. A summary of the results in Table 3 shows that mo of the variables have values lower than 0.5 except for LONTASS /LATOBOR 0.51) and ROA/ ROE (-0.79). However, these observations do not pose a proble because the variables are not included in the same regression specification (s Equations 1 & 2 and the robustness check).

Table 3: Pairwise Correlation Analysis Results

Variable	LONTASS	LATOBOR	LNTOT	ETA	LLRGL	ROA	ROE	SQLNTOT
LONTASS	1.000							
LATOBOR	-0.510***	1.000						
LNTOT	0.251***	-0.361***	1.000					
ETA	-0.114*	0.231***	-0.279***	1.000				
LLRGL	-0.376***	0.134**	-0.123**	0.031	1.000			
ROA	0.166***	-0.066	-0.124**	0.377***	-0.374***	1.000		
ROE	0.251***	-0.055	-0.001	0.043	-0.404***	-0.789***	1.000	
SQLNTOT	0.282***	-0.340***	0.190***	-0.319***	-0.144**	-0.155**	0.001	1.000

Source: Authors' computation from data described in Section 3.1
Note. Table 3 presents results of pairwise correlation analysis for varial described in Section 3.3.
*,**, *** indicates 10%, 5% and 1% level of significance respectively.

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The main independent variable of interest (LONTASS) is observed to be positively correlated with ROA (0.17) and ROE (0.25) confirming the a-priori expectation. Nevertheless, we still run the regression equation to determine the influence of the liquidity variable on profit in the presence of other important factors.

4.3 The Effect of Bank Liquidity on Bank Profitability

Table 4 presents the result of Two-step system GMM for Equations 1 and 2. Model 1 in the table has return on assets as the dependent variable while model 2 has return on equity as the dependent variable. The coefficient for the two lagged dependent (ROA_{t-1} and ROE_{t-1}) are both positive and statistically significant at 1% level of significance. This implies that the models are correctly specified as dynamic models whose past profit level affects current profit performance (Dietrich & Wanzenried, 2014). It also indicates the need to use an instrumental variable technique of analysis that addresses endogenous problems of lagged dependent variables such as the GMM method. The diagnostic tests validates the use of such a method as observed in the absence of serial correlation in AR(2) ($p>0.1$), non-significance of the Sargan test ($p>0.1$) and joint significance of the variables as indicated by the F-Statistic ($p<0.01$).

The main variable of interest, liquidity (LONTASS), has a positive and significant effect on profitability in the two models. This confirms the bankruptcy cost hypothesis that banks holding more liquid assets benefit from the higher perception in funding markets which reduce their financing costs and increase profitability (Bordeleau & Graham, 2010; Bourke, 1989). This is in contrast to Demirguc-Kunt et al. (2003) argument that banks with higher level of liquid assets have lower profits than banks with lower liquid levels.

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Table 4: Two-Step System GMM Results for the Effect of Bank Liquidity on Bank Profit

Variables	Model 1 (Dependent variable = ROA)	Model 2 (Dependent variable = ROE)
ROA_{t-1}	0.377***	-
	(0.074)	
ROE_{t-1}	-	0.127***
		(0.032)
LONTASS	0.023***	0.203***
	(0.003)	(0.022)
ETA	0.0663***	-0.648***
	(0.013)	(0.095
LLRGL	-0.054***	-0.844***
	(0.126)	(0.106)
LNTOT	0.428*	7.163***
	(0.230)	(1.749)
SQLNTOT	-0.029*	-0.566***
	(0.017)	(0.104)
F-Statistic (p-value)	0.000	0.000
AB test AR(1) (p-value)	0.027	0.063
AB test AR(2) (p-value)	0.635	0.348
SARGAN test (p-value)	1.000	1.000
Number of Banks	37	37
Number of Observations	201	201

Source: Results obtained from two-step system GMM regression for Equations 1 and 2 by authors.

Note. This table presents estimates of the two-step system GMM regression for Equations 1 and 2. Dependent variable in model 1 is ROA and ROE in model 2. Other variables are as defined in Table 1. Values in parenthesis are robust standard errors. P-values for the F-statistic, Arellano-Bond (AR1 and AR2) statistics and the Sargan test are reported in the table. AB test AR(1) and AR(2) denote the Arellano–Bond test that average autocovariance in residuals of order 1 and order 2 as 0 with the null hypothesis of no autocorrelation. *and *** indicates 10% and 1% level of significance respectively.

The coefficients of the three control variables (capital strength, credit risk and size) have the expected signs with varying degrees of significance. Capital strength variable (ETA) in Model 1 is significantly positive at $P<0.01$ although negative in Model 2. Model 1 is in line with the a-priori expectation of the capital buffer

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theory that banks build up capital to guard against liquidation risk (Diamond & Piesse, 2016; Kosmidou, 2008, Milne, 2002). The reduced risk increases the bank's worthiness and costs related to funding, and thus profits. This argument is also related to the bankruptcy cost hypothesis that explains the relationship between liquidity and bank profit. Credit risk (LLRGL) in both models is statistically significant and negative at $P<0.01$ implying that lower credit risk is necessary for increased bank profits (Anees, 2012). The coefficient of the size variable (LNTOT) in both models is positive and statistically significant indicating the presence of economies of scale in operations that reduce costs of information gathering and processing (Dietrich & Wanzenried, 2014; Goddard et al., 2004; Kosmidou, 2008). The non-linear effect of size on profitability is indicated by the negative and statistically significant variable of the square of size (SQNLTOT). This implies that banks that become too big may be faced with diminishing returns due to bureaucratic and management problems (Athanasoglou et al., 2008; Demirguc-Kunt et al., 20

4.4 Robustness Test (LATOBOR)

To confirm the robustness of the results reported in Table 4, we replace the liquidity variable in Equations 1 and 2 with an alternative measure of liquidity, liquid assets to total deposits and borrowing. The results reported in Table 5 shows that signs and coefficients of the variables are quantitatively similar to those in Table 4.

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Table 5: Two-Step System GMM Results for the Effect of Bank Liquid on Bank Profit (LATOBOR)

Variables	Model 3 (Dependent variable = ROA)	Model 4 (Dependent variable = ROE)
ROA_{t-1}	0.347***	-
	(0.047)	
ROE_{t-1}	-	0.121***
		(0.013)
LATOBOR	0.009***	0.093***
	(0.003)	(0.021)
ETA	0.003	-0.798***
	(0.008)	(0.079)
LLRGL	-0.164***	-1.403***
	(0.012)	(0.130)
LNTOT	1.160***	14.290***
	(0.294)	(1.889)
SQLNTOT	-0.080***	-0.966***
	(0.017)	(0.119)
F-Statistic (p-value)	0.000	0.000
AB test AR(1) (p-value)	0.010	0.023
AB test AR(2) (p-value)	0.736	0.483
SARGAN test (p-value)	1.000	1.000
Number of Banks	37	37
Number of Observations	166	166

Note. This table presents estimates of the two-step system GMM regression f Equations 1 and 2. Dependent variable in model 3 is ROA and ROE in model LONTASS in Table 4 is replaced with LATOBOR. Other variables are as define in Table 1. Values in parenthesis are robust standard errors. P-values for the l statistic, Arellano-Bond (AR1 and AR2) statistics and the Sargan test are reporte in the table. AB test AR(1) and AR(2) denote the Arellano–Bond test that averag autocovariance in residuals of order 1 and order 2 as 0 with the null hypothesis c no autocorrelation. *** indicates 1% level of significance.

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5.0 Conclusion and Recommendation

Bank profit is one of the ways liquidity affects bank operations. In the abse
regulations and taking into consideration, the trade-off relationship betwee
profitability and liquidity, most banks would prefer to hold liquid assets tha
maximise bank profits. Given the important role played by banks in an econo
this position would put the financial system in problem due to banks not having
required level of liquidity (less than the amount required) consequently leadi
bank failure. Thus, this study investigated the effect of bank liquidity on ba
performance using the bankruptcy cost and risk return relationship hypothes
Annual bank-specific data for the period 2000-2014 are obtained from
commercial banks in Kenya, Nigeria and South Africa while the two-step syste
GMM is used to analyse the data. The results revealed a positive and statistica
significant relationship between bank profit and liquidity in line with the bankrupt
cost hypothesis. Consistent with previous research, control variables such as ba
capital, credit risk and bank size were also found to have significant effects o
bank profitability.

Based on these findings, this study recommends that banks should maintain liquid
levels that lower financial distress costs. This is achievable by having high capit
ratios that increase credit worthiness and lowers funding costs. However, notin
that one of the proxies for liquidity in this study is the ratio of total loans to tota
assets; it is important for banks to recognise the associated credit risk involved i
having a high liquidity ratio emanating from this measure.

The present study nonetheless has some limitations upon which future researc
may build on. First, the effect of macroeconomic factors (such as the state of the
economy, inflation, regulatory effects etc.) are not considered. Second, only banks
in three countries were selected which may affect the generalisability of the findings
to other countries in the region. Third, the investigation in the study is limited to the
linear relationship. Future research may build on these limitations to expand the
frontier of knowledge on the topic.

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References

Ahmad, R., Koh, E. H., & Shaharuddin, S. S. (2016). Determinants of ba profitability: a comparative study of East Asia and Latin Ameri *International Journal of Banking, Accounting and Finance, 7*(1), 51.

Akhtar, S. (2007). *Pakistan: changing risk management paradigm-perspec of the regulator*. Paper presented at the ACCA Conference-CFOs: T Opportunties and Challenges Ahead, Karachi.

Alharbi, A. T., & Alharbi, A. T. (2017). Determinants of Islamic banks' profitabil international evidence. *International Journal of Islamic and Mid Eastern Finance and Management, 10*(3), 331-350.

Anees, A. A. A. N. (2012). Liquidity risk and performance of banking syste *Journal of Financial Regulation and Compliance, 20*(2), 182-1 doi:10.1108/13581981211218342

Arellano, M., & Bover, O. (1995). Another look at the instrumental varia estimation of error-components models. *Journal of econometrics, 68*(29-51.

Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). Bank-specif industry-specific and macroeconomic determinants of bank profitabili *Journal of International Financial Markets, Institutions and Mon 18*(2), 121-136.

Barth, J. R., Nolle, D. E., Phumiwasana, T., & Yago, G. (2003). A cross-coun analysis of the bank supervisory framework and bank performanc *Financial Markets, Institutions & Instruments, 12*, 67-120.

Basel Commission on Banking Supervision (2010). *Basel III: Internation framework for liquidity risk measurement, standards and monitorin* Bank for International Settlement

Baur, D. G. (2012). Financial contagion and the real economy. *Journal of Banki & Finance, 36*(10), 2680-2692. doi:10.1016/j.jbankfin.2011.05.019

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions dynamic panel data models. *Journal of econometrics, 87*(1), 115-14

Scanned with CamScanner

Blundell, R., & Bond, S. (2000). GMM estimation with persistent panel data: an application to production functions. *Econometric reviews, 19*(3), 321-340.

Bordeleau, E., & Graham, C. (2010). *The impact of liquidity on bank profitability*. Bank of Canada Working Paper 2010-38

Bourke, P. (1989). Concentration and other determinants of bank profitability in Europe, North America and Australia. *Journal of Banking and Finance, 13*, 65-79.

Cabral, R. (2013). A perspective on the symptoms and causes of the financial crisis. *Journal of Banking & Finance, 37*(1), 103-117. doi:10.1016/j.jbankfin.2012.08.005

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2013). *Applied multiple regression/correlation analysis for the behavioral sciences*: Routledge

Cooper, M. J., Jackson, W. E., & Patterson, G. A. (2003). Evidence of predictability in the cross-section of bank stock returns. *Journal of Banking and Finance, 27*, 817-850.

Cornett, M. M., McNutt, J. J., Strahan, P. E., & Tehranian, H. (2011). Liquidity risk management and credit supply in the financial crisis. *Journal of Financial Economics, 101*, 297-312. doi:10.1016/j.jfineco.2011.03.001

Decker, P. A. (2000). *The changing character of liquidity and liquidity risk management: A regulator's perspective*. Federal Reserve Bank of Chicago Banking Supervision and Regulation Research

Delis, M. D., & Kouretas, G. P. (2011). Interest rates and bank risk-taking. *Journal of Banking & Finance, 35*(4), 840-855.

Demirguc-Kunt, A., Laeven, L., & Levine, R. (2003). *The impact of bank regulations, concentration, and institutions on bank margins*. World Bank Policy Research Working Paper 3030

Dietrich, A., & Wanzenried, G. (2011). Determinants of bank profitability before and during the crisis: evidence from Switzerland. *Journal of International Financial Markets, Institutions and Money, 21*(3), 307-327. doi:10.1016/j.qref.2014.03.001

Scanned with CamScanner

Dietrich, A., & Wanzenried, G. (2014). The determinants of commercial banking profitability in low-, middle-, and high-income countries. *The Quarterly Review of Economics and Finance, 54*(3), 337-354.

Djalilov, K., & Piesse, J. (2016). Determinants of bank profitability in transition countries: What matters most? *Research in International Business and Finance, 38*, 69-82.

Flamini, V., Mcdonald, C., & Schumacher, L. (2009). *The determinants of commercial bank profitability in Sub-Saharan Africa.* International Monetary Fund Working paper 0915

Frank, M. Z., & Goyal, V. K. (2009). Capital structure decisions: which factors are reliably important? *Financial Management, 38*(1), 1-37.

Fu, X. M., Lin, Y. R., & Molyneux, P. (2016). Bank capital and liquidity creation in Asia Pacific. *Economic Inquiry, 54*(2), 966-993.

Goddard, J., Molyneux, P., & Wilson, J. O. S. (2004). Dynamics of Growth and Profitability in Banking. *Journal of Money, Credit and Banking, 36*, 1069-1090.

Ibiam, O. A., & Chinedu, N. L. (2017). Effect of Corporate Governance on Risk Management of Commercial Banks in Nigeria. *International Journal of Finance and Accounting, 6*(5), 145-153.

Jenkinson, N. (2008). Strengthening regimes for controlling liquidity risk: some lessons from the recent turmoil. *Bank of England Quarterly Bulletin, 2*.

Kargi, H. S. (2011). *Credit risk and the performance of Nigerian Banks.* Unpublished Manuscript Ahmadu Bello University Zaria, Nigeria.

Kithinji, A. M. (2010). *Credit risk management and profitability of commercial banks in Kenya.* Unpublished Manuscript School of Business, University of Nairobi, Nairobi.

Kolapo, T. F., Ayeni, R. K., & Oke, M. O. (2012). Credit risk and commercial banks' performance in Nigeria: a panel model approach. *Australian Journal of Business and Management Research, 2*(2), 31-38.

Kosmidou, K. (2008). The determinants of banks' profits in Greece during the period of EU financial integration. *Managerial Finance, 34*, 146-159.

Scanned with CamScanner

Kosmidou, K., Tanna, S., & Pasiouras, F. (2005). *Determinants of Profitab of Domestic UK Commercial Banks: Panel Evidence from the Per 1995-2002*. Paper presented at the Money Macro and Finance (Mo Research Group Conference.

Lee, J. Y., Growe, G., DeBruine, M., & Cha, I. (2015). Measuring the impac the 2007–2009 financial crisis on the performance and profitability of regional banks *Advances in Management Accounting, 25*, 181-206

Marcus, A. J. (1984). Deregulation and Bank Financial Policy. *Journal of Bank and Finance, 8*, 557-565.

Matz, L. (2008). *Liquidity risk: new lessons and old lessons*. Paper presen at the Financial Managers Society Inc. White Paper.

Mebounou, T. G. C., Karan, M. B., & Dannon, H. (2015). Liquidity and ba profitability in WAEMU zone: a panel data analysis. *Afro-Asian Journ of Finance and Accounting, 5*(2), 113-134.

Milne, A. (2002). Bank capital regulation as an incentive mechanism: implicatio for portfolio choice. *Journal of Banking and Finance, 26*, 1-23.

Mlachila, M., Dykes, D., Zajc, S., Aithnard, P.-H., Beck, T., Ncube, M., Nelvin, O. (2013). *Banking in sub-Saharan Africa; Challenges an Opportunities*. Luxembourg: European Investment Bank.

Morris, S., & Shin, H. S. (2016). Illiquidity component of credit risk. *Internation Economic Review, 57*(4), 1135-1148.

Moussa, M. A. B. (2015). The determinants of bank liquidity: case of Tunisi *International Journal of Economics and Financial Issues, 5*(1), 24 259.

Musembi, D. M., Ali, B., & Kingi, W. (2016). Effect of liquidity risk determin on the financial performance of commercial banks listed at the Nairo securities exchange. *Imperial Journal of Interdisciplinary Researc 2*(11), 2142-2170.

Obamuyi, T. M. (2013). Determinants of banks' profitability in a develop economy: evidence from Nigeria. *Organizations and Markets Emerging Economies* (2), 97-111.

Scanned with CamScanner

Ongore, V. O., & Kusa, G. B. (2013). Determinants of financial performance of commercial banks in Kenya. *International Journal of Economics and Financial Issues, 3*(1), 237.

Roodman, D. (2009). A note on the theme of too many instruments. *Oxford Bulletin of Economics and statistics, 71*(1), 135-158.

Shen, C. H., Chen, Y., K, Kao, L. F., & Yeh, C. Y. (2009). *Bank liquidity risk and performance*. International Monetary Fund working Paper.

Shuremo, G. A. (2016). Determinants of bank' profitability: evidence from banking industry in Ethiopia. *International Journal of Economics, Commerce and Management, 4 (2)*, 422-463.

Singh, A., & Sharma, A. K. (2016). An empirical analysis of macroeconomic and bank-specific factors affecting liquidity of Indian banks. *Future Business Journal, 2*(1), 40-53.

Soludo, C. C. (2009). *Banking in Nigeria at a time of global financial crisis*. Paper presented at the Special Interactive Session on the Banking System at The Eko Hotel & Suites, Victoria Island, Lagos.

Verardi, V., & Croux, C. (2009). Robust regression in Stata *Stata Journal, 9*(3), 439-453.

Vithessonthi, C. (2014). The effect of financial market development on bank risk: evidence from Southeast Asian countries. *International Review of Financial Analysis, 35*, 249-260.

Scanned with CamScanner