THE EFFECTS OF BASEL III LIQUIDITY REGULATIONS ON BANKS' PROFITABILITY

Tafirei Mashamba [*]

* Great Zimbabwe University, Zimbabwe
Contact details: P.O Box 1235, Masvingo, Zimbabwe

Abstract

The new Basel III Liquidity Coverage Ratio standard which encourages banks to maintain a diversified pool of high-quality liquid assets against their short-term expected net cash outflows although it appears to be noble from a theoretic perspective it may weigh down banks' performance because liquid assets earn low returns. It is against this background that this study sought to evaluate the impact of the new Basel III liquidity regulations on the profitability of banks in emerging market economies. A sample of 40 banks operating in 11 emerging markets over the period 2011 to 2016 was used in the study. For estimation, system Generalized Method of Moments (GMM) estimator was employed. Surprisingly, empirical results demonstrated that regulatory pressure stemming from Liquidity Coverage Ratio requirement increased instead of diminishing the profitability of banks in emerging markets. The plausible explanation given for this evidence was that banks in emerging markets managed their liquidity in a manner that is consistent with Liquidity Coverage Ratio rule hence the regulation had no detrimental effects on banks in emerging economies.

Keywords: Basel III, Liquidity Coverage Ratio, Bank Profitability, Emerging Markets, GMM

1. INTRODUCTION

Liquidity is fundamental to the ongoing existence of banks. Concerns about bank liquidity emanate from their maturity transformation function in the economy. Typically, banks accept short-term demand deposits, which they loan out to businesses. Under the fractional banking system depository institutions, banks loan out a greater part of their deposits and keep a small fraction of the deposits. In the process of providing this vital social service to the economy, banks expose themselves to liquidity risk. Banks can mitigate this risk by holding a large pool of liquid assets, which they can draw down to pay off maturing obligations during a crisis (Davies, 2014).

The significance of liquidity falls beyond an individual bank because liquidity problems at an individual bank can quickly cascade to other banks largely. In other words, a liquidity crisis is contagious. In line with this view, Gomes and Wilkins (2013) emphasize that imprudent liquidity management can cause serious difficulties for individual banks, which can transcend to system-wide disturbances leading to a collapse in financial intermediation. Trouble in the market can begin at an individual bank facing idiosyncratic liquidity problems. The classic fall of

Lehman Brothers in September 2008, which dragged other financial institutions into severe liquidity stress, clearly demonstrated the contagious nature of illiquidity. Accordingly, liquidity management ought to be an important task for bank managers and to be routine. The need for routine liquidity management is reinforced by the fact that banks largely finance their loans with deposits, which expose them to liquidity risk. In addition, banks face a dilemma on the right amount of liquidity to hold. Excessive liquidity sacrifice net interest income, while low liquidity breed liquidity risk (Fiscal Policy Research Institute 2010). Accordingly, the aim of liquidity management is to ensure that a bank hold adequate liquid assets which can be run down to extinguish liabilities in crisis situations as well as to ensure that the bank finance its activities with stable funding sources that are not prone to "freeze" in crisis situations (Gongol and Vodová 2014).

The importance of sound liquidity management for banks and bank regulators has been rekindled following havoc that rocked financial markets between 2007 and 2009. During the period, several banks that over-relied on wholesale funding to finance their ever-growing balance sheets experienced acute liquidity problems. Due to the

interconnectedness of the financial system, liquidity challenges that were experienced by US and European banks rapidly spread into other markets leading to a worldwide liquidity crisis. In order to reinforce the reliance of either banks to liquidity shocks emanating from either the financial sector or real economy, the Basel Committee on Banking Supervision published two new liquidity standards, namely the liquidity coverage ratio (LCR) and net stable coverage ratio (NSFR) in December 2010. The LCR requires banks to maintain a large stock of unencumbered high-grade liquid assets. This buffer is intended to enhance banks resilience to a severe liquidity crisis lasting for 30 calendar days. On the other hand, the NSFR require banks to fund their businesses with stable funding sources.

One of the main concerns raised about liquidity standards is their possible adverse effects on banks profitability. Both academics and practitioners in the banking industry suspect that Basel III liquidity regulations are likely to diminish banks' profitability as it compels banks to invest more in low yield earning liquid assets (Macro Assessment Group 2010, Banerjee and Mio 2017). Moreover, banks may reduce lending in pursuit of the regulations, which in turn may weigh down their earnings since banks' profits are mainly drawn from loans. This study attempts to contribute to liquidity regulations and bank profitability discourse by exploring the effects of Basel III liquidity standards on the performance of banks in emerging markets. In addition, the study attempts to ascertain variables that influence the profitability of commercial banks in emerging markets. The impetus to focus of emerging markets is because emerging economies are bank based; hence, any disturbance in their activities and performance may jeopardize financial intermediation in emerging markets. The rest of the paper is structured as follows: chapter two attends to literature review; chapter three outlines research methodology and chapter four presents, analyses and discusses empirical results. Lastly, chapter five concludes the study and offers plausible recommendations.

2. LITERATURE REVIEW

2.1 Description of the Liquidity Coverage Ratio

Basel III liquidity regulations are composed of the liquidity coverage ratio (LCR) and net stable funding ratio (NSFR). Banks started to report the LCR in January 2015, although its full implementation is expected in January 2019. The NSFR will become binding in January 2018. Hence, this study pays attention to the LCR rule, which is now binding. Accordingly, the study provides a detailed summary of the LCR specification based on Basel Committee on Banking Supervision document titled *Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools – bcbs238*. By definition, the LCR is described as the proportion of high-quality liquid assets to total net cash outflows. The LCR aims to enhance banks short-term resilience to liquidity shocks by requiring them to maintain ample stock of unencumbered high-quality liquid assets (HQLA) that can be sold easily and quickly to pay off the bank's obligations over a 30-day liquidity stress situation. It is given by the following formula.

$$LCR = \frac{High\ Quality\ Liquid\ Assets}{Total\ Net\ Cash\ Outflows} \geq 1 \qquad (1)$$

On an ongoing basis, the rule requires banks to maintain a buffer of high-quality liquid assets (HQLA) equal to or above 100% (1) of total net cash outflows (TNCO) over the next 30 day calendar period. Banks are required to report the LCR on at least a monthly basis but reporting frequency may be increased during a crisis. Two classes of assets make up the inventory of HQLA, namely level 1 and level 2. Level 1 assets comprise of cash and bank notes and highly liquid securities that can be readily converted into cash even in a crisis such as government securities and statutory reserves. Level 2 assets comprise of assets that can be sold at near full value in a crisis like high-grade corporate bonds, covered bonds and claims on quasi-government entities such as municipal bonds. HQLA must neither be encumbered nor pledged as security to a third party. TNCO is described as the sum of outflows expected over the next 30-day calendar period minus the lesser of inflows and 75% of outflows. In other words, TNCO is defined as either the bank's expected 30-day outflows less the greater of its expected 30-day inflows or 25% of its anticipated 30-day outflows.

The LCR modifies both inflows and outflows to imitate a severe liquidity crisis. Outflows are adjusted by assigning minimum runoff rates based on the type of liability. Runoff rates increase in proportion to funding instability. For instance, retail deposit covered by explicit deposit insurance which is presumed to be stable carry a runoff rate of 5%. In other words, the LCR assumes that in a crisis about 5% of retail deposits will be withdrawn. For inflows, the LCR presumes that during a crisis banks will not roll over loans to other financial intermediaries; hence, they will have 100% of inflows at their disposal to cover withdrawals. Pertaining to other non-financial sector clients like retail borrowers, the standard presumes that 50% of gross inflows will be rolled over to customers leaving the bank with 50% of gross inflows to meet the rule. Furthermore, the LCR also take into account off-balance sheet outflows. Banks are required to account for 100% net outflows connected to collateral and credit downgrades. In addition, banks must also take into account outflows emanating from falling value of collateral due to fire sales. Moreover, banks must also assume that credit and liquidity lines will be drawn down; therefore, they ought to assign appropriate runoff rates that vary between 5% (for retail clients) to 100% (for financial intermediaries). Briefly, the LCR is designed in such a way that it distinguishes between volatile and stable funding sources.

2.2 The interplay between liquidity regulations and bank profitability

Before Basel III, there were no harmonized liquidity regulations. As such, very few studies have explored the impact of liquidity regulations on bank profitability as discussed herein. Banerjee and Mio (2017), explored how British banks responded to the Individual Liquidity Guidance Rule (ILG), which is designed in the same philosophy as the Liquidity Coverage Ratio, using Jordà (2005) local projection impulse response analysis. They found that the ILG negatively affect banks' profitability through

increased holdings of low yield liquid assets and switching towards expensive non-bank deposit funding. Giordana and Schumacher (2017) investigated the impact of Basel III capital and liquidity requirements on default probability and profitability of banks in Luxembourg. They constructed historical series of banks capital and liquidity ratios for the period 2003 to 2011 with respect to Basel III requirements and then empirically examined whether historical banks' NSFR and LCR impact banks' probability of default and profitability. Since the study was interested in endogenous relationships between profit, capital, liquidity regulations (NSFR and LCR) and other bank characteristics, system GMM was employed for estimation. Study results revealed that Basel III liquidity standards induce a reduction in banks' probability of default. Furthermore, the impact of liquidity regulations on banks profitability was found to be less clear-cut suggesting that banks' funding structure instead of asset composition matters for profitability. In light of this scanty literature, this study also seeks to contribute to the body of knowledge by exploring the relationship between liquidity regulations and bank profitability.

3. METHODOLOGY

3.1 Empirical model and Variables

3.1.1 Empirical model

In order to investigate the impact of the LCR on banks profitability a dynamic panel regression model which takes the following form is formulated:

$$ROA_{ict} = \alpha + \lambda ROA_{ic,t-1} + \beta X_{ict} + \phi REGPRESS \quad (2)$$
$$+ \rho MACFIN_{ct} + v_{it} + \varepsilon_{ict}$$

Where:
ROA_{ict}:   Return on equity for bank i, in country c, at time period t.
α: Constant coefficient.
ROA_{ict-1}:   Lagged return on equity
$\lambda, \beta, \phi, \rho$ Coefficients to be estimated which reflect the extent to which a change in a given explanatory variable influences the dependent variable.
X_{ict}:   Vector of banks specific characteristics.
$MACFIN_{ct}$:   Vector of macro-financial factors.
v_{it}:   Unobservable time-invariant bank fixed effects.
ε_{it}:   Idiosyncratic error term.

3.1.2 Variables description

3.1.2.1 Dependent variable (ROA)

There are two main ratios commonly used to measure firm profitability: return on assets (ROA) and return on equity (ROE). The former is expressed as net profit after tax to total assets while the latter is given as the ratio of net profit after tax to shareholders' equity. Similar to Athanasoglou et al (2005, 2006) and Said and Tumin (2011) this study uses return on assets (ROA) to assess bank profitability. The choice of ROA over the usual ROE metric is because ROE disregards financial advantage and risks associated with it

(Athanasoglou et al 2006, European Central Bank 2010). In other words, ROE is risk insensitive.

ROE weakness can be revealed by decomposing the ratio. ROE can be decomposed by multiplying ROA with the equity multiplier, that is $ROE = ROA*(TotalAssets / Equity)$. The equity multiplier (TotalAssets/Equity) measures financial advantage. This leverage component can significantly boost ROE, yet, other risk elements such as the ratio of risky assets and solvency position of the institution are missing in the indicator (European Central Bank 2010). Thus, ROE is considered a dependent metric. In that regard, Rivard and Thomas (1997) and European Central Bank (2010) suggests that ROA is a more reliable measure than ROE with respect to efficiency performance since it is adjusted for leverage. Besides, as further pointed out by European Central Bank (2010) ROE is a point-in-time indicator since it lacks forward-looking. Before the crisis, ROE figures showed homogeneity in bank returns; however, some of the banks with high ROEs before the crisis were hard hit by the global financial crisis. This demonstrates that ROE is a short-term indicator that may fail to accurately reveal the true performance of a firm especially in times of crisis.

Nevertheless, ROA may be biased since it ignores revenue generated from off-balance sheet activities (Flamini et al 2009). In the present study this bias was assumed negligible since banks in emerging market economies are generally less involved in complex off-balance sheet activities; hence, income from off balance sheet activities for banks in the sample was presumed to be small. Likewise, risk connected to advantage may not be high for banks in emerging markets as they tend to be less leveraged because they depend less on debt funding.

3.1.2.2   Explanatory variables and Hypotheses

a) Lagged dependent variable ($ROA_{ic, t-1}$)

The study adopted a dynamic panel regression model on the assumption that bank profits are persistent over time due to market structure imperfections (Fama and French 2000, Goddard et al 2004). To capture persistence in bank profits the variable lagged return on assets ($ROA_{ic, t-1}$) was included among covariates.
    H₁: Bank profits are persistent

b) Bank size (SIZE)

Modern financial intermediation theory suggests that there are efficiency gains related to size because of economies of scale (Goddard et al 2004). Economies of scale can be described as the reduction in the cost of production associated with increasing quantity of production (Kovner et al 2015). Due to economies of scale, large banks are expected to be more profitable as they can spread their costs among many units resulting in low operating costs. Based on the economies of scale theory the study predicts that size positively influences bank performance.
    H₂: Bank profitability increases with bank size

c) Bank capital (CAP)

Bank capital is another bank-specific variable that was predicted to have a significant influence on bank

profitability. Modigliani and Miller (1958), argues that in a perfect capital market world, without bankruptcy costs and asymmetric information, the capital structure of a firm does not affect its value, rather its value is driven by the firm's earning power. Nevertheless, when the perfect market assumption is relaxed an increase in capital would lower costs associated with financial distress and bankruptcy, and in turn, lead to higher earnings. Similarly, in a world characterized by asymmetric information banks expecting better performance transmit this information to the market by holding high capital (Berger 1995). Besides, equity capital provides a source of funding to banking institutions. Hence, banks with high levels of equity capital have more funds to invest which allows them to reap more profits. In addition, highly capitalized banks are assumed to have a low default risk and this improves their creditworthiness (Rao and Lakew 2012). Consequently, banks with large capital face low cost of funding, which positively affects their earnings.

H_3: Growth in equity capital positively drives bank profitability.

d) Operational efficiency (Cost_INC)

Another factor that is likely to affect bank performance is operational/management efficiency. Following Mathuva (2009) and Kovner et al (2015) the study measures management efficiency using the traditional cost to income ratio metric. The ratio is expressed as the ratio of operating expenses (costs) to operating income. As a rule of thumb, the lower the ratio the more profitable the bank is and vice versa. Thus, the metric informs about management's efficacy in controlling operating costs. Besides highlighting how efficiently a bank is being run, the cost to income ratio may also indicate potential problems. If the ratio is increasing from one period to the next, it shows that costs are increasing at a higher rate than income which may lead to reduced profitability (Hussain 2014).

H_4: High cost to income ratio is associated with low profitability.

e) Credit risk (NPL)

Lending is the principal source of revenue for commercial banks. However, high loan defaults may decrease a bank's profitability. This study, therefore, predicts that credit risk measured by the ratio of non-performing loans to total loans impact bank profitability negatively. This suspicion is reinforced by empirical findings of Freedman and Click (2006) that credit risk is high in emerging markets due to weak contract enforcement laws and legal environment as well as asymmetric information.

H_5: Credit risk impact bank profitability negatively.

f) Bank liquidity (LIQ)

As aforementioned, liquidity refers to the ability of a bank to settle its short-term obligations timeously at minimal costs. In that regard, the more liquid a bank is the greater its ability to pay off maturing obligations. One way a bank can enhance its liquidity is by investing more funds in liquid securities. This pool of liquid assets is used as a buffer against unexpected cash outflows. In this study, bank liquidity was measured by the liquid asset ratio. This ratio expresses a bank's holdings of liquid assets as a proposition of total assets. Nevertheless, the amount of liquidity maintained by a bank (in terms of liquid assets holdings) may influence its profitability since liquid securities earn low returns. Therefore, banks with a high level of liquid assets holdings are predicted to be less profitable.

H_6: Bank profitability decreases as they invest more in liquid securities.

i) Deposits (DEP)

Traditionally commercial banks make money by accepting low-cost short-term deposits and issuing out long-term loans at higher rates (De Young and Rice 2004). It follows that banks with large deposits can be assumed to be more profitable since they have more funds to loan out. Therefore, this study hypothesizes that deposits positively influences bank profitability.

H_7: Deposits positively influences bank profitability.

j) Specialization (SPEC)

The main source of commercial banks revenue is loans since they are the main players in traditional financial intermediation (Borio et al 2017). As such, this study hypothesizes that banks that specialize in lending are able to reap high profits from the loans, provided loan defaults are very low.

H_8: Lending specialization positively contributes to banks' profitability.

k) Liquidity Regulation (REGPRESS)

The main variable of interest in this study is regulatory pressure variable that captures the influence of Basel III LCR on banks profitability. In line with Abreu and Gulamhussen (2013) and Tanda (2015), the study hypothesizes that the influence of regulatory pressure is based on each bank's current liquidity level (measured by the liquidity ratio (LCR_{ict}). The study expects regulatory pressure to be more pronounced in banks with a LCR shortfall (that is, LCR below 100% or 1) relative to banks with a LCR above 100% or 1 - the minimum requirement. This intuition is based on the fact that LCR deficit banks are subject to more regulatory scrutiny (Pereira and Saito 2011), hence, regulators can influence banks liquidity management decisions. Thus, the study expects LCR shortfall banks to have greater incentives to adjust their liquidity for fear of regulatory sanctions. However, increased holdings of may diminish banks profitability because liquid assets earn low returns. Thus, this study investigates the impact of the LCR rule on the profitability of banks in emerging market economies. Similar to Van Roy (2008), the study measures regulatory pressure by specifying a regulatory pressure dummy variable ($REGPRESS_{ict}$) which is measured as the gap between the bank's LCR and Basel minimum threshold of 1 (that is, 1 - LCR_{ict}). ($REGPRESS_{ict}$) takes the value of 1 for deficit banks (that is, banks with a LCR below 1) and zero for banks with an LCR above 1.

H_9: An increase in regulatory pressure diminishes banks profitability.

l) Economic activity (GDP)

Real Gross Domestic Product is a primary indicator of a country's overall economic health status (Rao and Lakew 2012). Moreover, extant literature, such as Levine (2000) demonstrated that a positive relationship exists between finance and economic growth. Hence, this study hypothesizes that growth in real Gross Domestic Product positively influences the profitability of banks in emerging markets.

H_{10}: Growth in real Gross Domestic Product positively influences banks profitability.

m) Monetary policy (MP)

Monetary policy is a tool used by central banks to control overall banking sector liquidity. When the central banks set a low policy rate, to stimulate economic activity, bank lending tends to rise leading to reduced bank liquidity, all else equal (Rauch et al 2009). Since lending is the principal source of bank profitability, this study predicts that monetary policy easing enhances bank profitability.

H_{11}: Monetary policy easing enhances bank profitability.

3.2 The Data and Data Sources

The starting point for sample selection is a population of commercial banks operating in twenty-three (23) emerging market economies listed in Table 1 derived from Morgan Stanley Capital Index list of emerging market countries.

Table 1. MSCI Emerging Markets Index

MSCI emerging markets index		
Americas	*Europe, middle east & Africa*	*Asia*
Brazil	Czech Republic	China
Chile	Egypt	India
Colombia	Greece	Indonesia
Mexico	Hungary	Korea
Peru	Poland	Malaysia
	Qatar	Philippines
	Russia	Taiwan
	South Africa	Thailand
	Turkey	
	United Arab Emirates	

First, the study only considers countries that have fully implemented the liquidity coverage ratio rule as of 31 December 2016. To do that, the study chooses countries that have largely or fully complied with the regulation based on Basel Committee's Assessment of Basel III LCR Regulations consistency under its Regulatory Consistency Assessment Programme. As of December 2016, the following countries have been assessed and found to be compliant or largely compliant with LCR specification: Hong Kong; India; Mexico; Saudi Arabia; South Africa; Argentina; Indonesia; Korea; Russia; Singapore and Turkey. This screening process results in a sample of eleven (11) countries.

Next, to ensure that the sample is comprised of 'pure' commercial banks, the study follows Berger and Bouwman (2009) and Bruno et al (2014) screening procedure. The study removes banks with the following features from the sample that were perceived to reflect a non-commercial bank: have zero deposits; have no outstanding loans; do not have commercial real estate or commercial and industrial loans outstanding; have zero or negative equity capital and resemble a building society (with home loans exceeding 50% of gross total loans). Initially, the sample population is made up of ninety-one (91) banks operating in eleven (11) countries. After screening, the sample of the study is comprised of forty (40) commercial banks.

Data of individual banks was obtained from Income Statements and Balance Sheets. This data was retrieved from Bankscope, a databank containing financial statements for banks (Matejašák and Teplý 2007); and is widely used by academic researchers to obtain banks data, for instance, Jokipii and Milne (2011) and Ashraft et al (2016). The main advantages of Bankscope database are that it is fairly comprehensive and it presents financial data in standardized formats, that is after adjusting for differences in accounting and reporting standards across jurisdictions (Vazquez and Federico 2015). However, the disadvantage of this database is that it does not provide a concise breakdown of some asset and liabilities elements; therefore, extrapolation and interpolation techniques may have to be applied to obtain missing values. Similar to previous researchers such as Oura et al (2013) and others macro-financial data was sourced from World Bank database. Moreover, due to data availability constraints for banks in emerging markets and for the sake of minimizing missing values as far as possible the study uses year-end data. Year-end data also seems reasonable in that bank portfolios are slow to change (Berger and Bouwman 2009). Furthermore, to minimize gaps missing data were obtained from individual banks financial statements from their websites. Likewise, consolidated financial statements were utilized in order to show the total liquidity position of individual banks. The study utilized consolidated data that was converted to a common currency, United States of America dollar (USD). For analysis, Stata econometric software version 13 was used.

3.3 Study Period

The sampling window for this research covers the period January 2011 to December 2016. The choice of this period is based on event study concept. Basically, event studies analyze the reaction of firms' share prices to corporate announcements (Kothari and Warner 2004). As such, the study presumes that

banks started to adjust their balance sheets soon after the announcement of Basel III liquidity requirements in December 2010, such that by January 2015 they would have complied with minimum requirements. For this reason, the study period is limited to the period January 2011 to December 2016. Consequently, the study considers a "pure" Basel III period like Abreu and Gulamhussen (2013) who examined the influence of risk-based capital requirements on banks centering on a "pure" Basel I period. Furthermore, the sampling window is post the global financial crisis that eliminates the global financial crisis structural breaks.

4. EMPIRICAL RESULTS

4.1 Descriptive Statistics

In this section, descriptive statistics of variables used in the study are analyzed. The dependent variable employed is a return on assets (ROA) which informs about management's ability to generate earnings from the firm's assets. The repressors used in the study are liquid assets ratio, the square of liquid assets ratio, bank size, bank capital, cost-to-income ratio, non-performing loans, specialization, bank deposits, real gross domestic product and central bank rate. The summary statistics are presented in Table 2.

The variable SPEC that was used to measure business specialization reported a mean value of 0.59 with a standard deviation of 0.11. The range value of 0.46, which is given as maximum value minus minimum value (0.81 - 0.35), shows that there is less dispersion in the panel dataset. This analysis is confirmed by the small standard deviation value of 0.11, which highlights that there is little spread in specialization among sampled banks. These results suggest that most commercial banks in the study specialize in traditional intermediation function of deposit acceptance and loan extension.

The average value of cost to income ratio among sampled banks is quite high. The ratio averaged 60.35% for the period January 2011 to December 2016. This ratio signifies that for every $100 operating income generated by the banks $60.35 went towards operating expenses. The positive skewness value of 6.20 reflects that the right tail of the distribution is longer than the left tail while the large kurtosis value of 54.65 shows that the distribution has heavy tails.

Bank size which was measured by the natural logarithm of assets had an average value of 19.23 with a standard deviation of 3.51%. Considering that natural logarithm was employed to limit the variation of maximum and minimum bank size values, descriptive statistics show that bank size dispersion is small. This suggests that banks used in the sample do not have significant differences in their sizes. Banks used in the sample are homogenous based on the small sample size dispersion. This evidence suggests that banks used in the sample are concentrated. A concentrated banking system is characterized by a few large banks that control the market with a long tail of small banks. These results concur with Ernst and Young (2013) finding that 5 largest banks in emerging markets hold about 70% of each respective country's total banking system assets.

Bank profitability was measured by return on equity (ROE). ROE is calculated as net profit after tax divided by shareholders capital and measures the returns / profits earned to shareholders on the funds they have supplied. The average return on equity reported for sampled banks over the period 2011 to 2016 was 9.81%, meaning on average bank executives managed to generate a positive return for their shareholders. Analyzing the minimum value of -86.75% and a maximum of 32.58%, it appears some banks in the sample made significant losses while some reported healthy profits over the sample period. Concomitantly, the standard deviation for ROE was 13.08% indicating that profit variation among the selected banks over the period January 2011 to December 2016 was large.

The study used real gross domestic product growth (GDP) as a proxy for business cycles. From Table 2 GDP have a mean value of 3 with a standard deviation of 2.28 and a minimum and the maximum value of -3.77 and 8.77 respectively. The average GDP is positive showing that countries used in the sample reported positive economic growth over the period 2011 to 2016. In addition, the magnitude of GDP dispersion is relatively low (2.28%) suggesting that economic growth among emerging economies for the period 2011 to 2016 is not widely dispersed. Notwithstanding this, the minimum value of (-3.77) suggests that some of the countries used in the sample experienced negative growth in economic output during the period under investigation.

Lastly, the central bank rate was used to reflect the impact of monetary policy on banks' liquidity holdings. Central bank rates averaged 5.65% during the study period. The standard deviation reported is 2.93%, which suggests that there is a small variation in policy rates set by central banks in the sample.

4.2 Correlation Matrix

The pairwise correlation matrix was used reflect the nature of the relationship between variables used in the study. The analysis was mainly focused on statistically significant correlations. Three variables were analyzed namely specialization (SPEC), COST to INCOME ratio (COST_INC) and the regulatory dummy variable REGPRESS.

The correlation between specialization and bank deposits is 0.5188. This means specialization is positively correlated to bank deposits. This relationship is not surprising since banks in emerging markets are more focused on traditional financial intermediation; therefore, growth in deposits tend to boost banks' lending activities. The correlation between specialization and the regulatory pressure dummy variable REGPRESS is negative and statistically significant, suggesting that banks responded to regulatory pressure emanating from liquidity rules by decreasing lending.

The variable cost to income ratio is positively correlated to non-performing loans. This correlation indicates that growth in non-performing loans causes banks' cost to income ratio to rise. This evidence is plausible in that rising non-performing loans signifies poor credit risk assessment and management, which may lead to reduced bank profitability. Similarly, increase in cost to income ratio reflects inefficient cost management, which may chew a bank's profits. Hence, the variables tend to co-move.

Table 2. Descriptive statistic

Description	Variable	Mean	Standard Deviation	Skewness	Kurtosis
Net Profit/Total Assets	Profit (ROA)	0.88	2.61	-7.87	92.15
Liquid Assets/Total Assets	Bank liquidity (LIQ)	34.27	23.71	0.28	1.54
(Liquid Assets/Total Assets)^2	Bank liquidity squared (LIQ^2)	1734.07	1823.87	0.70	1.97
Ln(Total Assets)	Bank size (SIZE)	19.23	3.51	-0.31	3.12
Total Capital/Total Risk Weighted Assets	Bank capital (CAR)	10.20	4.42	1.81	7.20
Operating Costs/Operating Income	Management efficiency (COST_INC)	60.35	31.36	6.20	54.65
Non-Performing Loans/Outstanding Loans	Credit risk (CR)	4.36	10.46	8.45	77.42
Loans/Total Assets	Specialization (SPEC)	0.59	0.11	-0.39	2.04
Retail Deposits	Bank deposits (DEPOSITS)	0.66	0.14	-0.85	3.55
Real Gross Domestic Product growth	Real GDP growth (GDP)	4.20	2.28	-0.78	4.19
Central Bank Rate	Monetary policy (MP)	5.65	2.93	-0.13	2.79

Source: Own construction based on data obtained from Bankscope.
***,**,* denotes 1%, 5% and 10% significance level respectively.

Table 3. Correlation Matrix

	ROA	LAR	LAR2	SIZE	CAR	COST_INC	NPL	SPEC	DEPOSITS	REGPRESS	GDP	CBR
ROA	1.0000											
LAR	0.0522	1.0000										
LAR2	0.0386	0.9782***	1.0000									
SIZE	0.0438	0.0459	0.1097	1.0000								
CAR	0.0751	0.1467**	0.1824**	0.2143***	1.0000							
COST_INC	-0.3628***	0.1566**	0.1659**	0.0931	0.0106	1.0000						
CR	-0.1694**	-0.0215	-0.0301	-0.0085	0.2460***	0.2195***	1.0000					
SPEC	-0.0441	0.0584	0.2162***	0.3468***	0.2484***	0.1084	0.0353	1.0000				
DEPOSITS	-0.1323*	-0.0698	0.0094	0.1771**	-0.1119	0.1076	0.0783	0.5188***	1.0000			
REGPRESS	0.0638	-0.1278*	-0.183**	-0.1002	0.0181	0.0744	0.0171	-0.3797***	-0.0003	1.0000		
GDP	-0.077	-0.093	0.0012	0.1746**	0.1085**	-0.0284	0.1445**	0.4541***	0.5619***	-0.0005	1.0000	
MP	0.0699	0.0978	0.1568**	0.0462	0.1214*	0.0649	0.1063	0.2581***	-0.1277*	-0.1212***	0.0907	1.0000

Source: Own construction based on data obtained from Bankscope.
***,**,* denotes 1%, 5% and 10% significance level respectively.

REGPRESS is positively correlated to ROA. This relationship implies that increased regulatory pressure causes bank profitability to increase. One reasonable explanation to these results could be that increased holdings of liquid assets reduce banks funding costs as they are perceived to have low liquidity risk thereby resulting in high profitability (Bordeleau and Graham 2010). Another plausible explanation of research findings could be that banks performance is not necessarily linked its asset composition but other factors - internal and external (Marozva 2015).

4.3 Unit root test results

In order to avoid spurious regression, the panel dataset was first checked for unit roots. The Maddala-Wu Fisher type test was tested using the Augmented Dicker-Fuller unit root test and the results are displayed in Table 4. The results show that all variables are stationary in levels; therefore, it can be concluded that the panel dataset did not contain unit roots. As such, the data can be applied in regression analysis without problems of spurious regression.

Table 4. Unit root test results

Variable description	Variable	Chi-square value	Order of Integration
Net Profit/Total Assets	Profit (ROA)	264.7177***	0
Liquid Assets/Total Assets	Bank liquidity (LIQ)	192.6386***	0
(Liquid Assets/Total Assets)^2	Bank liquidity squared (LIQ^2)	224.7806***	0
Ln(Total Assets)	Bank size (SIZE)	256.1203***	0
Total Capital/Total Risk Weighted Assets	Bank capital (CAR)	186.3055***	0
Operating Costs/Operating Income	Management efficiency (COST_INC)	157.2066***	0
Non-Performing Loans/Outstanding Loans	Credit risk (CR)	155.4583***	0
Loans/Total Assets	Specialization (SPEC)	215.8900***	0
Retail Deposits	Bank deposits (DEPOSITS)	254.9454***	0
Real Gross Domestic Product growth	Real GDP growth (GDP)	417.6138***	0
Central Bank Rate	Monetary policy (MP)	277.5196***	0

Source: Own construction based on data obtained from Bankscope. ***, **, * denotes 1%, 5% and 10% significance level respectively.

4.4 Results analysis and Discussion

Table 5. Results of the impact of liquidity charges on banks profitability

Variable	Model 1		Model 2	
	Coefficient (1)	Economic impact (2)	Coefficient (3)	Economic impact (4)
Profit (ROA$_{ic, t-1}$)	0.6506*** (0.0268)	-	0.6349*** (0.1665)	-
Bank liquidity (LIQ)	0.1763*** (0.0457)	1.6012	0.1665*** (0.0268)	1.5125
Bank liquidity squared (LIQ^2)	-0.0031*** (0.0006)	-2.1663	-0.0030*** (0.0004)	2.0964
Bank size (SIZE)	0.1041*** (0.0234)	0.1763	0.1017 (0.0237)	0.1722
Bank capital (CAR)	0.0494 (0.2604)	0.0664	-0.0358 (0.2940)	-0.0481
Management efficiency (COST_INC)	0.0020 (0.0032)	-0.0240	-0.0018 (0.0040)	-0.0216
Credit risk (CR)	-0.1285*** (0.0075)	0.1763	-0.1300*** (0.0090)	-0.521
Specialization (SPEC)	5.7239* (3.2285)	-0.2412	6.4126*** (3.0395)	0.2703
Bank deposits (DEPOSITS)	6.3891*** (1.9316)	0.3427	7.6587*** (1.9207)	0.1426
Regulatory pressure (REGPRESS)	0.5311** (0.037)	0.0656	0.6919** (0.2939)	0.0853
Real GDP growth (GDP)	-0.0739 (0.0661)	-0.0646	-0.1248* (0.0605)	-0.1090
Monetary policy (MP)	-0.1239*** (0.0300)	-0.1391	-0.2353*** (0.0605)	-0.2642
Time fixed effects	No	No	Yes	Yes
Arellano-Bond (2) test Sargan test Wald test	0.1422 0.1215 82 594.55***		0.1881 0.1255 73 695.51***	

Source: Own design based on data obtained from Bankscope. ***, **, * denotes 1%, 5% and 10% significance level respectively. Standard errors are displayed in parenthesis (brackets). Time dummies coefficient not reported for brevity.

Before discussing empirical results displayed in Table 4.4 it is pertinent to highlight that the empirical model used in this study passes both the Arellano and Bond test of second-order autocorrelation in residuals and Sargan test of instruments validity because the p-values are statistically significant, that is, greater than 5% significance level. The study, therefore, can conclude that reported estimates do not suffer from autocorrelation and instrument over-identification problems that may result in wrong inferences. Wald test results also show that the model is properly fit since the p-value is statistically significant, that is, less than 5% significance level. The results displayed in Table 4.4 columns 1 and 2 exclude time dummies while the results in columns 3 and 4 controls for time dummies. On the whole, time fixed effects have no significant impact on estimated empirical results.

4.4.1 Lagged dependent variable ($ROA_{ic, t-1}$)

The study found a significant positive association between ROA and ROA_{t-1}, suggesting that banks in the sample have target levels of profitability they pursue. Without time dummies, the coefficient of 0.6506 on the lagged dependent variable ($ROA_{ic,t-1}$) corresponds to an adjustment speed of about 0.35, which is 1 minus lagged return on assets ratio (1-0.6506), indicating that commercial banks in the sample close 35% of deviation from desired profit level within a year. When time dummies are included the adjustment speed increases to roughly 0.37. This slow adjustment speed is consistent with the claim that adjustment costs preclude banks to instantly adjust. In addition, this evidence appears to be consistent with the view that bank profits are persistent over time, meaning current levels of bank

profits are closely related to their previous values. This view is in line with Fama and French (2000) who documented that firm profits are mean reverting in a competitive environment. In their paper, Fama and French (2000) highlighted that profitable firms tend to be imitated by less profitable ones thereby losing their competitive advantage. On the other hand, less profitable firms have strong incentives to implement prudent investment decisions to enhance their profitability. The overall effect of this behavior is that banks operating profits revert to their mean average in the long run.

4.4.2 Bank liquidity (LIQ) and Bank liquidity squared (LIQ^2)

The empirical results show that bank liquidity positively contributes to the profitability of commercial banks in emerging markets since the point estimate on the variable LIQ in Model 1 is 0.1763. This finding opposes the conventional wisdom that liquidity negatively affects bank profitability. A one standard deviation increase in liquid assets investments causes bank profitability to rise by 1.6 units. In an attempt to explain why credit markets are inefficient in emerging markets Freedman and Click (2006) noted that some banks in emerging market economies prefer to invest in government securities than lending to the private sector. The authors highlighted that factors such as moderate returns earned on government securities, low administration, and transaction costs motivates banks in emerging markets to hold government securities portfolios. The fact that banks in emerging markets can earn satisfactory returns on government securities may explain the positive association between bank liquidity and profitability.

Figure 1. Relationship between liquid assets and bank profitability
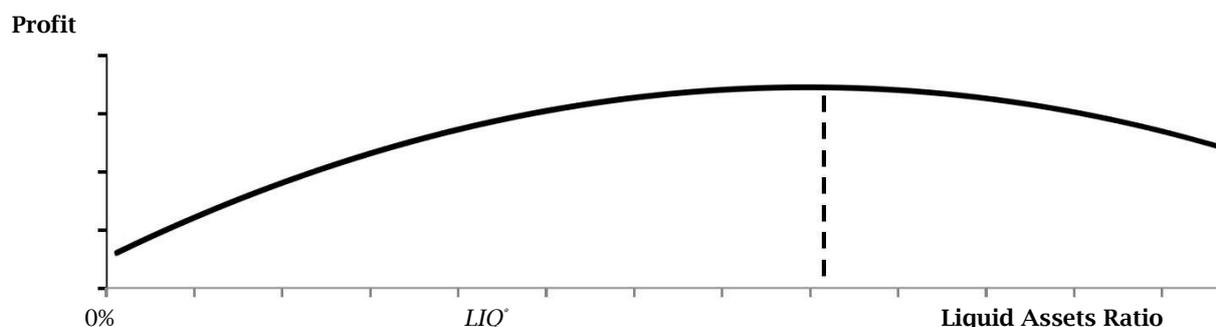
Furthermore, consistent with expectations and previous literature from both emerging market economies (Shahchera 2012) and advanced economies (Bordeleau and Graham 2010); empirical results show that a non-linear relationship exists between the square of bank liquidity and bank profitability. As illustrated in Figure 4.1, the negative and statistically significant point estimate on (β_2) shows that profitability is maximized at LIQ^*. Stated differently, the association between bank profitability and the square of LIQ is in form of a downward concave parabola. The implication of these findings is that there are marginal benefits of holding liquid securities up to a certain optimal point (LIQ^*), beyond this point further increase in liquid securities holdings diminishes banks' profits, all other things

constant. This evidence concurs with the intuition that funding markets reward banks that hold significant liquid assets by charging them low-interest rates because they are perceived to be liquid and able to settle obligations (Bordeleau and Graham 2010). Nevertheless, beyond the optimal point (LIQ^*) marginal benefits of holding liquid assets are outweighed by marginal costs of increasing holdings of low yield earning liquid assets. Moreover, these findings agree with the inventory theory of liquidity buffer which maintains that there are costs and benefits of maintaining liquidity buffers (Baltensperger 1980, Santomero 1984). The inventory theory states that maintaining a buffer of liquid assets is costly in terms of low returns earned by liquid assets relative to risky assets. On the other

hand, the benefit of keeping liquidity buffers is that liquid assets provide a cushion against unexpected liquidity shocks. Liquidity buffers allow banks facing unexpected cash outflows to liquidate the liquefiable securities to cover maturing obligations rather than selling illiquid assets (loans) at fire-sale prices to cover the liquidity deficits.

4.4.3 Regulatory pressure (REGPRESS)

The key variable in this analysis is (REGPRESS), which is a dummy variable that attempts to measure the impact of liquidity standards on banks profitability. Results of estimating equation 4.5 with the two-step system GMM estimator indicate that the coefficient of REGPRESS is positive and statistically significant at 5% level. Therefore, the study could not find evidence at 5% level to confirm the hypothesis that an increase in regulatory pressure diminishes bank profitability. In fact, a one standard deviation increase in regulatory pressure causes bank profitability to increase by 6.56%. Thus, contrary to the widespread belief that Basel III liquidity measures would erode banks' profitability this study found that regulatory pressure emanating from liquidity standards enhances the profitability of banks in emerging economies. These results may not be surprising when one considers the goal of Basel III liquidity standards. The regulations at aimed at enhancing banks' resilience to liquidity shocks arising from either an economic or financial market crisis. In this context, Giordana and Schumacher (2017) found that Basel III liquidity requirements reduce banks' probability of default. Thus, increased liquid assets holdings enhance the safety/stability of a bank (Diamond and Kashyap 2016). Literature has pointed out that safe banks can attract cheap funding (both deposits and equity) as they are perceived to be highly creditworthy (Kosmidou 2008). As such, empirical results may be demonstrating that liquidity standards, which enhance the safety of banks, enabled banks in emerging markets to source funding at low costs leading to higher profitability. This analysis agrees with the expected bankruptcy cost theory postulated by Berger (1995) and applied by Bordeleau and Graham (2010). Based on the expected bankruptcy cost theory advanced by Berger (1995) an increase in capital is associated with a reduction in a bank's financing costs because investors consider highly capitalized banks to be safe; hence, they charge low premiums to such borrowers. Bordeleau and Graham (2010), extended this concept to examine the relationship between bank liquidity and profitability. Bordeleau and Graham (2010), the assertion was that an increase in liquid assets gives banks favorable perception in funding markets, thereby reducing their funding costs and increasing their earnings, all else equal. Therefore, these results could be supporting the intuition that increasing liquid assets increases bank profits by lowering banks' funding costs, *ceteris paribus*.

Moreover, these results may be suggesting that banks in emerging markets devised new business strategies to improve their profit on the backdrop of heightened regulatory pressure. Banks might have passed regulatory burden/costs to consumers through raising lending rates or increasing service fees to remain profitable. In the context of this, Ernst and Young (2013b) observed new strategies adopted by banks in Indonesia, Turkey, South Africa and Malaysia to boost their profits in Basel III regime. In Indonesia, banks diversified into micro and high margin retail lending. Because of increased focus on microlending profits for banks in Indonesia have been rising. Banks in Turkey introduced new service fees such as on credit cards and increased collections on existing fees to remain profitable. In South Africa, all big banks repriced their loans in response to increased funding costs. Besides repricing loans, banks in South Africa engaged in active portfolio management in South Africa by switching from low yield assets such as mortgages to high yield assets like unsecured lending and auto loans. In Malaysia, a change in asset mix is taking place, where banks have reduced interbank lending and central bank deposits and switched to high yield earning fixed income securities since bonds in Malaysia pay 4.5% while central bank instruments attract between 3 - 3.3%. Because of this change in asset mix, a large proportion of profits for banks in Malaysia are now derived from bond holdings.

In addition, management quality, business specialization and strategic management tools and decisions may differ across banks; therefore, returns that managers can generate on a bank's assets may also vary between banks. As such, banks with high levels of liquid assets holdings may not be necessarily less profitable as argued by Alger and Alger (1999). Such inference is consistent with Marozva (2015) who concluded that bank performance is not necessarily depended on its assets composition but other internal factors and macroeconomic fundamentals may also explain bank profitability. Marozva (2015) concurs with Giordana and Schumacher (2017) finding that funding structure rather than asset composition affect bank profitability.

Alternatively, this evidence may be offering support to earlier results obtained under the second objective. Objective two findings offered that Basel III liquidity standards are less effective in emerging economies possibly because banks in emerging economies already had elevated liquid assets holdings before Basel III came into effect. In other words, banks in emerging market economies managed their balance sheet liquidity in a manner that is consistent with the LCR charge; hence, its adoption in emerging markets seems not to have adversely affected banks profitability. To support this analysis the present study contracts findings of Banerjee and Mio (2017) study conducted in the United Kingdom (developed economy) and empirical findings from emerging economies. Banerjee and Mio (2017), concluded that stricter liquidity measures adversely affected the earnings of British banks primarily by coercing them to shift towards low interest earning liquid assets. Yet, evidence from this study suggests that increased holdings of liquid assets actually increased the profitability of banks in emerging markets possibly because they already held large liquidity buffers. Therefore, this comparison demonstrates that Basel III appears to have more profound effects on banks in developed economies that emerging markets.

4.4.4 Capital (CAR)

Research findings show that a positive and statistically significant relationship exists between

changes in bank capital and changes in bank profitability. The point estimate of CAR indicates that a 10% rise in capital causes banks' profitability to increase by about 18%. Consistent with hypothesis 3 and previous studies, Athanasoglou (2006) and Flamini et al (2015) the study established that growth in bank capital positively contributes to banks' profitability. The positive and significant association between capital and return on assets implies that the one period model of perfect capital markets with symmetric information is irrelevant to the emerging markets banking sector. In other words, this evidence suggests that emerging markets' capital markets are imperfect. Therefore, considering an imperfect market characterized by asymmetric information and bankruptcy costs, one would expect the capital structure to have an influence on earnings capacity of banks contrary to Modigliani and Miller (1958) proposition that capital structure does not influence firm performance. In an imperfect capital market, highly capitalized banks can borrow at low costs as a result of reduced expected bankruptcy costs and financial distress (Berger 1995). Similarly, when the symmetric information assumption is relaxed thereby allowing the signaling hypothesis to hold, banks expecting better performance would signal this positive information by maintaining high capital ratios (Berger 1995). Thus, from this analysis, it can be inferred that in an imperfect world characterized by asymmetric information and bankruptcy costs banks with large capital ratios tend to post huge profits.

Another interpretation of these results could be that commercial banks in emerging markets made sound lending decisions over the period 2011 to 2016 which confirms the proposition that highly capitalized banks engage in risky lending to reap huge profits (Rao and Lakew 2012). This analysis agrees with Kosmidou (2008) finding that banks with high capital ratios have low default probability which enhances their creditworthiness and subsequently reduce their cost of funding thereby boosting their profits. Based on this evidence, boosting capital ratios of banks in emerging markets as enunciated under Basel III package is imperative as it offers banks additional buffers to withstand credit losses as well as liquidity shocks and also provides a safety net to depositors.

4.4.5 Bank size (SIZE)

Bank size, measured by the logarithm of total assets, was found to have a positive and statistically insignificant effect (coefficient is 0.1017) on the profitability of commercial banks in emerging markets in the model with time fixed effects. Thus, the proposition that bank profitability increases with bank size could not be verified by empirical results. This insignificant relationship may be attributed to the role of size in explaining banks profitability in the presence of Basel III. Before Basel III large banks relied on short-term wholesale funding to finance their business activities due to the "too big to fail" hypothesis explained earlier. Given that short-term funding tends to cheaper than long-term funding when one considers an upward sloping yield curve (Duijm and Wierts 2016); large banks may have enjoyed high profits by borrowing at low costs in the period preceding Basel III. However, it seems Basel III

has changed this by requiring banks, of all sizes, to shift their funding structures from unstable short term to reliable long-term funding instruments. This change could explain why the impact of SIZE on banks' profitability is statistically insignificant.

Although the coefficient of SIZE is not statistically significant its sign may warrant analysis. The positive association between bank size and profitability suggests that large commercial banks are more profitable than smaller banks. This evidence is in line with earlier studies which support the conjecture that big banks benefit from economies of scale and scope (Kosmidou 2008, Rao and Lakew 2012). Haunter et al (2005) documents that size affects bank efficiency via two possible channels. First, large banks because of their high market power are able to bargain for lower borrowing rates relative to smaller banks. Second, large banks are able to spread their fixed costs (economies of scale) leading to reduced operational costs and also tend to attract a highly specialized workforce which enhances their efficiency. Two important insights can, therefore, be drawn from this analysis. One, large commercial banks in emerging economies used in the study appear to enjoy economies of scale. Two, large commercial banks can use their market power to earn high profits.

4.4.6 Management efficiency (COST_INC)

Empirical results show that the coefficient of management efficiency, proxied by the cost to income ratio is statistically insignificant in both the model with time dummies and without time dummies. Hence, the assertion that management efficiency affects the performance of banks in emerging markets could not be verified by empirical results. Consequently, it can be inferred that operational efficiency is not an important determinant of profitability for banks in emerging economies. Although the coefficient of (COST_INC) is statistically insignificant at conventional levels, its sign could offer some important implications to bank managers. Since management efficiency is measured by the ratio of cost to income, a rise in this ratio implies that costs are rising at a higher rate than income, thereby indicating poor operational efficiency which results in reduced profitability, *ceteris paribus*. On the other hand, if revenue is rising at a higher rate than expenses, profitability would be enhanced, all else equal. Empirical results show that the sign of COST_INC is negative. This could imply that banks in emerging market economies were not efficiently managing their operating costs over the period of study. Thus, bank managers in emerging market economies should keep an eye on their operating costs to enhance their profitability.

4.4.7 **Credit Risk (CR)**

As expected, the variable NPL has the correct negative sign and is statistically significant at 1% level; hence, the study found evidence to support the claim that credit risk adversely affects the profitability of banks in emerging markets. The coefficient has a value of (-0.1285), conveying that a 12.85% increase in non-performing loans leads to a reduction in bank profitability by about 52%. Thus, the study found statistical evidence at 1% significance level to support

the proposition that an increase in non-performing loans erodes bank profitability, else equal. The ratio of non-performing loans to gross loans signifies how well management is managing its loan book. In consideration of the fact that interest income is the main source of revenue to commercial banks, growth in non-performing loans weighs down banks profitability. Study results suggest that banks in emerging markets used in the sample are lending beyond the repayment capacity of their borrowers or face difficulties in collecting outstanding debt. This could be attributed to challenges faced by banks in emerging markets in debt collection. Freedman and Click (2006) pointed out that it is difficult to enforce loan contracts in emerging economies due to the time and costs involved in the process. In addition, the International Finance Corporation (2004) asserts that collateral laws are weak in emerging markets because the judicial proceedings cause delays in repossessing and selling the pledged asset to recover funds loaned out. Consistent with this view Freedman and Click (2006) highlighted that it takes up to five years for banks in Brazil and Chile to seize and sell the pledged asset. Asymmetric information could also be another factor that impedes effective credit risk assessment in emerging economies. The absence of collateral registries and credit bureaus also makes it difficult for lenders to obtain all relevant information needed to evaluate the creditworthiness of potential borrowers. Moreover, accounting statements manipulation is also rampant in emerging countries when it comes to corporate lending. Cihak et al (2013), reports that earnings manipulation is about 40% and almost 100% for listed firms in Turkey and Zimbabwe respectively. These factors impede proper credit risk assessment leading to high non-performing loans, thereby eroding earnings of commercial banks in emerging markets.

4.4.8 Specialization (SPEC)

The variable SPEC was incorporated into the regression model to evaluate the impact of business models on banks profitability. It was measured as the proportion of loans to total assets, and the study predicted that banks specialized in lending are more profitable. As projected, the effect of specialization on bank profitability is strongly positive and statistically significant at 10% level. This means that the hypothesis that banks that specialize in lending reap more profits is confirmed. A one standard deviation increase in loan to assets ratio contributes 24% growth in banks profitability. These findings are consistent with the theory of specialization, which states that banks specialized in traditional lending are more profitable (Kolari et al 2006). The explanation that can be given to these results is the fact that net interest income from loans is the core source of revenue for commercial banks (Vong and Chan 2009). Lending is more profitable to banks than other forms of investments because margins on loans are generally higher than margins from other investment securities (Beccalli et al 2016). Therefore, empirical results suggest that commercial banks operating in emerging economies are actively engaged in traditional lending business.

4.4.9 Total bank deposits (DEP)

The estimated coefficient of the variable DEP is 6.3891 in Model 1 and it is statistically significant at 1% level. Similar to Vong and Chan (2009) and Shahchera (2012) the study found evidence to support the hypothesis that growth in deposits improves banks profitability. The coefficient of (6.3891) on the variable DEPOSITS shows that a 6 unit increase in total deposits of banks causes the return on assets to grow by approximately 0.34 units. Since commercial banks are normally inclined towards traditional financial intermediation, that is accepting deposits and converting them into loans, banks that are able to transform more deposits into loans tend to be more profitable, *ceteris paribus.* From a different perspective, given that deposits constitute a large portion of emerging economies banks' funding, as discussed earlier, banks that are able to borrow at low rates and offer loans at competitive rates should generate more earnings, all things equal. In the same vein, Demirgüç-Kunt and Huizinga (1999), highlighted that demand deposits in emerging economies usually attract interest rates that are below market rates; therefore, empirical results could be implying that banks in the sample are capitalizing on low deposits rates to maximize their returns.

4.4.10 Economic conditions (GDP)

Pertaining to the impact of macroeconomic fundamentals on banks profitability the study found a negative and statistically significant effect of GDP on bank performance in the model with time dummies. A 12% growth in economic output translates to a 6.46% reduction in banks profitability contrary to the conventional wisdom that economic growth enhances bank performance. Thus, this study found that economic growth diminishes the profitability of banks in emerging markets. A plausible explanation of these results could be that banks in emerging markets seem to be incautious in their lending. It appears they over-lend in times of economic booms. However, most of the loans may be improperly issued (no diligent credit appraisal) and collected resulting in high loan delinquencies and ultimately high credit losses which diminish their profitability. These results suggest that commercial banks in emerging markets need to lend conservatively in times of good economic prospects. Another possible explanation of these findings could be that although most economies have been in recovery post the global financial crisis loan losses probably incurred during the crisis are still haunting commercial banks in emerging market economies.

4.4.11 Monetary policy (MP)

Another macroeconomic variable considered in this study was central bank rate. This variable was included to assess the effects of changes in monetary policy on banks profitability. The variable MP exhibit a statistically significant coefficient of (-0.1239) in the model without time dummies, implying that a surge in central bank rates by 12.39% translates to a fall in bank profits to fall by 13.91%. It seems that tightening of monetary policy adversely affects depository institutions ability to generate profits. This impact can be examined via the centric view of monetary

policy also known as the bank lending channel. The centric view states that monetary policy tightening leads to reduced bank lending because a contractionary monetary policy depletes banks reserves thereby weakening their deposits bases and ability to lend (Janjua et al 2014). This transmission mechanism hinges on the influence of policy rates on benchmark interest rates. Considering that, the central bank rate is the yardstick rate used by banks in determining their lending rates (Bank of Zambia 2010); an increase in policy rates may lead to a rise in banks' lending rates resulting in weak demand of bank loans by both households and business entities, else equal. Since bank profits are significantly influenced by lending volumes a reduction in loan supply may result in reduced banks' profitability, *ceteris paribus*. Therefore, these results provide some evidence to the fact that the monetary policy affects the bank-lending channel of commercial banks in emerging economies.

5. CONCLUSION AND RECOMMENDATIONS

One of the main concerns raised about Basel III liquidity requirements is their potential undesirable effects on banks profitability since increased holdings of liquid assets is assumed to depress interest income as liquid securities generally earn low returns. It is on this background that this study evaluated the effects of liquidity charges on the profitability of banks in emerging economies. The key finding of interest was that regulatory pressure positively affects the ability of banks in emerging markets to generate profits. To that end, the study found evidence to refute the general belief that phasing in of liquidity regulations would adversely affect the performance of banks in emerging markets. It can be said that the LCR charge has no detrimental effects on the performance of banks in emerging markets. In fact, empirical evidence demonstrates that there are benefits for banks to hold more liquid assets. In light of these results, it can be concluded that funding structures rather than asset composition affect the profitability of bank in emerging markets. Accordingly, the study supports the implementation of Basel III liquidity regulations in emerging market economies. This evidence contributes to the interplay between liquidity regulations and banks profitability discourse.

Besides, increased holdings of liquidity securities ameliorate liquidity risk at bank level, which fosters banking sector stability. Since the study established that Basel III LCR rule did not erode the profitability of banks in emerging market economies over the period of study, investors (both local and international) are advised to consider stocks of banks in emerging market economies in their portfolios.

The non-linear relationship established between liquidity and profitability implies that there is an optimal level of liquidity that banks must hold in order to maximize profits. However, this benefit can only be enjoyed to the extent that the benefits of maintaining liquid assets outweigh opportunity costs of maintaining low yield earning assets. This implies that a risk-return trade-off exists between bank liquidity and profitability. This evidence highlights the importance of optimal liquidity management in banking firms. This study, therefore, recommends

bank executives in emerging markets to develop liquidity optimization models that assist them in making the most effective use of liquid assets they hold. Moreover, national regulators are advised to take into consideration the trade-off between safety and opportunity costs of holding low yield securities when they implement liquidity regulations in their jurisdictions.

The study also established that a positive relationship exists between bank deposits and profitability. The implication of this finding is that growth in deposits especially demand, which normally pays below market rates in emerging economies, does boost the profitability of banks in emerging markets. Therefore, bank executives in emerging markets are advised to design strategies that enable them to source more retail deposits. One way banks in emerging markets can increase their deposits is reaching the unbanked masses through agency banking. This strategy enables banks to venture into unbanked areas at low cost to boost their deposits and subsequently profits. At the same time, they should put in place robust credit risk management systems to minimize loan delinquencies that may arise as they transform more deposits into loans. This can be done by adopting sophisticated internal rating based approaches to credit risk assessment and measurement proposed under Basel II and III standards.

5.1 Limitations of the study

As with any study, limitations are bound to exist. In this present study, the following limitations were experienced. This study intended to collect data from many banks operating in emerging market economies; however, due to missing information in the Bankscope database, the study sample was restricted to forty banks, which may compromise the reliability of the results. This implies that study results may not be generalized beyond the sample that was gathered. Bankscope database is made up of data extracted from individual banks financial statements. Yet, published financial statements are prone to managerial manipulation, which may compromise the quality of information contained in the financial statements; therefore, affect estimated results. The reason why management may be reluctant to disclose all pertinent information is that they fear competitors may exploit disclosed information to their merit (Linsley and Shrives 2005). Therefore, in this study, data validity relied on the reporting quality of individual banks. The present study's period was confined to a "pure" Basel III period, that is, January 2011 to December 2016. However, during this period, banks could have been recovering from the effects of the global financial crisis implying that the sampling window might not have covered a "normal state of affairs". Nevertheless, the threat of this limitation is minimized by the fact that the global financial crisis was not as severe in emerging market economies relative to developed economies (International Monetary Fund 2011).

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