Liquidity Risk and Financial Performance of Commercial Banks in Kenya

Stella Kemunto Ratemo & Dr. F.W.S Ndede

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[1*]**Stella Kemunto Ratemo & [2]Dr. F.W.S Ndede**

[1*]**MBA student, School of Business, Kenyatta University**

[2]**Lecturer, Department of Accounting and Finance, School of Business, Kenyatta University**

[*]**Corresponding author's email: stellakemunto5@gmail.com**

Abstract

Commercial banks are essential entities in providing financial services among people, governments and business entities. Commercial banks contribute to the economy of the country via the tax revenue it remits to the government. The incapability of commercial banks to hold the right balance of the liquid assets for effective and efficient operations threatens their financial performance. Global financial crisis of the year 2007-2008 was a depiction of the importance of liquidity. Liquidity risks arise from failure to balance cash inflows against cash outflows. However, commercial banks fall short of the liquidity money to support their operations and also to lend to prospective borrowers undermining their financial performance. This study investigated how liquidity risks influence financial performance of commercial banks. The study was guided by specific objectives that include; effect of bank size, asset quality, operational efficiency and capital adequacy on financial performance commercial banks. The effect of money supply on the relationship between liquidity risks and financial performance of commercial banks was also determined. Causal research design was adopted in the study targeting 42 commercial banks operating in Kenya. Secondary data were extracted from financial books from individual commercial banks and CBK reports. Data analysis was undertaken by use of Stata 14.0 where descriptive results and panel models were generated. Results revealed that bank size is positively and significantly related to financial performance of commercial banks. It was also found that asset quality is negatively and significantly related to commercial banks' financial performance. Capital adequacy is positively but insignificantly related to commercial banks' financial performance. The operational efficiency of the bank was positively and significantly related commercial banks' financial performance. Money supply moderates the relationship between liquidity risks and performance of commercial banks since the coefficient of determination increased. The study recommended that commercial banks need to consider diversifying their product portfolio with aim of expanding their income revenue. Commercial banks need also to review their credit evaluation methods to ensure that only worthy borrowers borrow their funds with aim of reducing high cases of nonperforming loans. Award of loans should go hand in hand with some form of financial training, guidance ad advice for borrowers on how to allocate the funds borrowed. Adequate capital needs to be held by commercial banks as stipulated by banks operational regulations.

There is need to improve capacity development among bank employees with aim of enhancing operational efficiency in the bank.

Keywords: *Liquidity Risk, Financial Performance, Commercial Banks, Kenya*

1.0 INTRODUCTION

Banking sector facilitates financial intermediation among people, business and governments. Commercial banks have been in the front line of driving Kenya's economy (Sindani & Buchichi, 2013). However, periodic financial distress undermines the financial sustainability and performance of banks. In the event the commercial banks are not performing well, access to financial services among people, business enterprises and governments become a challenge (Adeyinka, *et al*., 2018). For instance, commercial banks aggregate earning using Return on Equity (ROE) was 21.99% in 2016 but declined to 23.10 in the year 2017. The decline in profitability of Kenyan commercial banks was also witnessed in the years 2013, 2014 and 2015 where ROE was 20.94%, 20.88% and 17.38 respectively (CBK, 2020). Likewise, in the year 2018, major tier 1 banks witnessed sharp decline in their profits with combine ROE of 17.03%. Consistent underperformance of commercial banks scares away investors who resort to withdraw their money for fear of losing them (Kiemo, *et al*., 2019). Several commercial banks have collapsed in Kenya a phenomenon that has been attributed to liquidity problems. The collapse of Imperial and Chase Bank were attributed to liquidity risk related problems (CBK report, 2017).

Liquidity risks describe the level of safety in terms of liquid assets a bank holds for its day to day commercial and financial operations (Bertham, 2011). The management of liquidity money by banks thus determines the level at which a commercial bank is able to operate sufficiently without going short of liquid money (Tran, et al., 2019). Liquidity risk thus connoted the ability of a commercial bank to finance its asset at a given point in time without risking incurring additional expenses that threaten its sustainability. Liquidity risk management remains a core task among commercial banks particularly when converting short term deposits to long term loans (Alali, 2019). Liquidity risks need to be carefully monitored as part of the wider financial risk management by paying close attention to market and credit risks. Despite the significant function of liquidity, many commercial banks have found themselves struggling to keep afloat threatening their financial performance; though this is yet to be proved empirically in the Kenyan context.

Liquidity risks emanates from the act where there are small financial inflows and large fund outflow at the bank (Chen, Shen, Kao & Yeh, 2018). The end result of this phenomenon is fund deficit by the commercial bank rendering it unable to advance loans to loan seekers or unable to meet their business operations. Liquidity risks seriously undermine commercial bank's ability to grow. Adequate liquidity buffers a bank during time of financial distress. Optimal liquidity stimulates financial performance of bank however; too much liquidity may be hindrance to bank's profitability (Arif & Anees, 2012). It is evidently clear that a commercial bank need to balance between short term assets and long term debts. Short term assets are easily convertible to liquid assets in the event a bank falls short of operational finances (Galletta & Mazzù, 2019). The liquidity risk elements include bank size, asset quality, operational efficiency and capital adequacy.

Bank size is a measure of the total assets it controls. A large bank can take the advantage of economies of scale to generate more profits for itself (Terraza, 2015). Asset quality entails the assessment of bank's assets with aiming of understanding the risks each asset possesses.

Conducting asset quality enables the bank to make an inventory of all the risks attached to the assets (Nomran, Haron & Hassan, 2017). This act allows the bank to segregate customers based in their ability to repay loans. Capital Adequacy connotes the amount of capital held by banks to offset liquidity risks in times of uncertainty. Capital adequacy act as a safety net of protecting depositors in case the bank collapses or goes out of the market. According to Antoun, Coskun and Georgiezski (2018) capital adequacy expresses the ability of the bank to manage liquidity risks and make prudent financial decisions regarding bank's liquidity position during financial crisis. Operational efficiency on the other hand describes bank's proficiency in running the business with goal of making sure that financial services and products are available to customers (Umoru & Osemwegie, 2016). Work ethics of the bank, the staff and management determine the level of operational efficiency in the bank.

Commercial banks in Kenya play the role of connecting borrowers and lenders. It also plays the role of holding money on behalf of depositors and creating financial platform to support savings. There are 43 commercial banks in Kenya according to 2019 Central Bank of Kenya (CBK) report where 29 are domestic while 14 are foreign owned. Central Bank of Kenya is the supreme bank with the mandate of formulating and implementing fiscal policies in Kenya while regulating commercial banks operations. The regulating functions of the CBK include stating the minimal capital requirements before an entry is registered to offer banking or financial services. Each and every commercial bank in Kenya has the function of ensuring that the bank holds the acceptable amount of liquid assets by balancing total liquid assets and total short-term liabilities. In Kenya, liquidity ratio in the banking sector averaged 48.6% in 2018. In 2017, liquidity state of commercial banks in Kenya was 43.7. According to CBK, statutory requirement, a bank must hold at least 20% of its assets in liquid. Liquid assets held by commercial banks allow the banks to fund their operations and other obligation during financial distress. Liquidity problems can degenerate into solvency problems among commercial banks if liquidity is not handled properly.

1.1 Research Objectives

i. To investigate the effect of asset quality on financial performance of commercial banks in Kenya.
ii. To establish the effect of bank size on financial performance of commercial banks in Kenya.
iii. To determine the effect of capital adequacy on financial performance of commercial banks in Kenya.
iv. To analyze the effect of operational efficiency on financial performance of commercial banks in Kenya.
v. To determine the moderating effect of money supply on the relationship between liquidity risk factors and financial performance of commercial banks in Kenya.

1.2 Research Hypotheses

i. Asset quality has no significant effect on financial performance of commercial banks in Kenya.
ii. Bank size has no significant effect on financial performance of commercial banks in Kenya.
iii. Capital adequacy has no significant effect on financial performance of commercial banks in Kenya.
iv. Operational efficiency has no significant effect on financial performance of commercial banks in Kenya.
v. Money supply does no significantly moderate the relationship between liquidity risk and financial performance of commercial banks in Kenya.

2.0 LITERATURE REVIEW

Vong *et al*, (2009) studied commercial bank-specific factors and profitability of commercial banks using ROA in Macao for the years 1993 to 2007. Panel model design was adopted in the empirical study. Asset quality had negative and significant relationship with commercial bank performance using ROA. Liu (2011) investigated how CAMEL model impacts profitability of Chinese commercial banks quoted at the Shanghai Stock Exchange. The period of the study was 2008-2011 targeting 13 Chinese commercial banks. Asset quality significantly and negatively impacts profitability of Chinese commercial banks. However, the study focuses solely on Chinese commercial banks. In Indonesia, Endah et al. (2018) studied liquidity risk and profitability of government owned ad foreign owned commercial banks. Time scope of the study was 2010-2016 periods. Asset quality negatively and significantly affects profitability of the government and foreign owned commercial banks. While focusing on commercial banks in SSA countries Buyinza (2010) studied profitability of these banks covering the years 1999-2006 using panel model. Bank size had a positive and significant relationship with bank profitability. This was a cross country study contrasting current study that focus on only one country with aiming of producing specific results for on particular country.

Ibrahim (2018) investigated the nexus between liquidity risks and profitability of Oversea-Chinese Banking Corporation operating in Singapore. This was a panel study covering the years 2003 and 2017. Operational efficiency positively impacted the profitability of the Oversea-Chinese Banking Corporation. Tran, Nguyen, Nguyen and Tran (2019) explored the determinants of liquidity risk of commercial banks in Vietnam from 2010 to 2015. OLS regression method was used. It was found that smooth pumping of money through the open market stabilizes the liquidity of the banking system was stabilized. In Nepal, Jha and Hui (2012) studied how financial characteristics impacts performance of Nepalese commercial banks. The time scope of the study was 2000-2010 among eighteen Nepalese commercial banks. Bank size significantly predicted bank performance measured by use of ROE and ROA. The study focus was Nepalese commercial banks contrasting current study that targeted Kenyan commercial banks.

In Latin America, Arias, Jara-Bertin and Rodriguez (2013) investigated the determinants of bank performance employing panel data. Seventy-eight (78) commercial banks were drawn from Brazil, Colombia, Argentina, Venezuela, Chile, Mexico, Peru and Paraguay for the period 1995-2010. It was established that bank size positively influences bank performance while liquidity risk ha d negative relationship with bank performance. In Bahrain, Trabelsi (2015) investigated the impact of liquidity risk on profitability Islamic. OLS was used to model relationship between independent variables and both ROE and ROA. Capital adequacy positively and significantly impacts ROA and ROE of Islamic banks. While focusing on Central and Eastern Europe countries, Antoun, Coskun and Georgiezski (2018) explored what determines financial performance of banks in the region. The study was panel 2009 to 2014. It was established that asset quality had negative relationship with bank size and positive relationship with business mix. Capital adequacy has a negative relationship with bank size and positive linkage with bank concentration.

Kwakwa (2014) studied how bank size affects financial performance of Ghanaian commercial banks. The measure of financial performance entailed ROE and ROA. Results revealed that size of bank positively and significantly influenced ROA. However, the relationship of bank size positively influenced ROE though the relationship was statistically insignificant. Ghanaian commercial banks were the focus of the study; thus, the results may not be generalizable to the Kenyan commercial banks. Aladwan (2015) investigated how bank size impacts profitability of quoted commercial banks. The study period was 200-2012. Profitability was measured suing

ROE. Output results of the study showed that profitability of banks differ significantly based on bank sizes. In Ghana, Afriyie (2011) investigated the impact of credit risk on performance of rural banks in the years 2006-2020. Panel data was adopted in the study. Capital adequacy positively and significantly impacts bank performance. It looked on commercial banks in Ghana unlike current study that focused on commercial banks.

In SSA, Ezra (2013) investigated the determinants of the profitability of commercial banks. The period of study was 1999-2006 employing unbalanced panel model. Capital adequacy positively and significantly impacts profitability of commercial banks. This was a cross country study contrasting current study that focus on only one country with aiming of producing specific results for on particular country. In Nigeria, Ogboi and Unuafe (2013) studied the nexus between credit risk and profitability of commercial banks for the period 2004-2009. Capital adequacy positively and significantly impacts financial performance of Nigerian commercial banks. In South Africa, Ifeacho and Ngalawa (2014) investigated how macroeconomic impacts bank performance. The study scope was 1994-2011 where bank performance was measured using ROE and ROA. There is a positive and significant relationship between capital adequacy and ROE. The study focused on commercial banks in South Africa ad has it is known, business environment for operation among commercial banks may differ from country to country or region to region. Ogboi and Unuafe (2013) analyzed how credit risk impacted Nigerian bank's profitability covering the yeas 2004-2009. This was a panel study. Operational efficiency is positively and significantly related to bank's financial performance using ROE. Nonetheless, the study only looked on Commercial Banks in Nigerian contrasting this study that studied commercial banks in Kenya.

Wekesa (2016) investigated how liquidity risk impacts profitability of commercial banks operating in Kenya. This was a panel study covering the period 2012-2018. Management efficiency positively impacts profitability of commercial banks operating in Kenya. Okoth and Gemechu (2013) investigated factors that impact financial performance of commercial banks in Kenya for the years 2001-2010. Capital adequacy significantly impacts financial performance of Kenyan banks. This study failed to undertake assumption tests and this may have impacted on the accuracy of the coefficient estimate. Current study checked all the assumptions of the study before estimating actual model. Mulwa (2015) conducted a study on the effect of monetary policy on the financial performance of commercial Banks in Kenya. The study adopted descriptive research design. The study found that one of monetary policy, were Central Bank buys securities on the open market, it increases the reserves of Commercial banks, making it possible for them to expand their loans which increase the money supply. Marende (2017) determined the effect of macroeconomic factors on financial development of commercial banks in Kenya. The study employed quarterly secondary data which was obtained from the Central Bank of Kenya. The financial development of commercial banks as measured by the above 4 ratios was found to be positively correlated with money supply (M3).

3.0 RESEARCH METHODOLOGY

Causal research design was utilized in the study. The study targeted 42 commercial banks covering the period 2012-2017. The data was extracted from financial reports of the individual commercial banks and CBK reports over the period 2012-2017. Stata 14.0 was used in analyzing the data where descriptive (minimum, maximum, mean and standard deviation) and inferential statics (panel regression) were employed. Descriptive statistics were used to describe and summarize the ratios of the variables in the study that included bank size, capital adequacy, asset quality, operational efficiency, money supply and commercial bank financial

performance. Inferential statistics was used to determine the effect of bank size, capital adequacy, asset quality and operational efficiency on commercial bank financial performance by determining the empirical model.

4.0 RESULTS FINDINGS AND DISCUSSION

4.1 Descriptive analysis

The descriptive as presented in Table 1 included means, minimums, maximums and standard deviations

Table 1: Descriptive Results

Variable	Obs	Mean	Std. Dev.	Min	Max
Capital adequacy	252	0.169182	0.085323	0.100099	0.847187
Bank size in KES million	252	76652.23	103876	2584	555630
Asset quality	252	0.123832	0.106522	0.004569	0.85646
Operational efficiency	252	0.310406	0.213613	0.01097	0.991743
Money Supply in KES billion	252	895.9	768	678	2197.8
ROE	252	0.133349	0.19332	-0.908	0.494

The first objective determined how asset quality affects financial performance of commercial banks operating in Kenya. Descriptive output showed that the mean of asset quality is 0.123832. The minimum asset quality is 0.004569 and maximum of 0.85646. The standard deviation is 0.106522 implying that asset quality varied across the study period. Asset quality entails the assessment of bank's assets with aiming of understanding the risks each asset possesses. The results concur with Ezra (2013) who established that asset quality negatively impacts profitability. Sound assets quality entail proper award of loans considering credit worth of borrowers and as per loan ward guiding policies. According to Liu (2011) asset quality negatively and significantly impacts financial performance of Chinese commercial banks.

Second objective was opined to determine how size of a bank influences its profitability. And the results entailed means, standard deviations, minimums and maximums. It was established that average bank size using total assets was KES 76652.23 million, smallest bank size-controlled KES 2584 million worth of assets while largest bank-controlled KES 555,630 million worth of total assets. The standard deviation was 103876 implying that bank sizes varied across banks. The efficiency and effectiveness of a bank in converting assets into profits is linked to the amount of assets it controls. These findings are in line with Kwakwa (2014) who revealed that size of a bank positively influenced ROE though the relationship was statistically insignificant. Likewise, Jha and Hui (2012) established that bank size significantly predicted bank performance measured by use of ROE and ROA.

The third objective was to determine how capital adequacy affects commercial bank financial performance in Kenya. Descriptive data analysis included means, standard deviations, minimums and maximums. Average capital adequacy is 0.169182. Lowest capital adequacy ratio was 0.100099 while highest capital adequacy ratio 0.84719 in that order. The Std. Dev. was 0.085323 implying that capital adequacy was varying across banks. Capital Adequacy connotes the amount of capital held by commercial banks to offset liquidity risks in times of uncertainty. Capital adequacy act as a safety net of protecting depositors in case the bank collapses or goes out of the market. The results are in line with Ifeacho and Ngalawa (2014)

investigated how macroeconomic impacts bank performance and found that capital adequacy positively and significantly impacts ROE. As per the CBK regulations, banks need to hold minimum of 14% of their aggregate assets as core capital. Commercial banks controlling substantial large amount of capital are able to take up on riskier and rewarding investments as compared to banks holding less capital and have to rely on debt financing. This is due to debt covenants which restricts borrower from financing high risk projects. Pradhan and Shrestha (2017) established that core capital ratio negatively profitability of commercial banks measured using ROE in Nepal.

Forth research objective endeavored in determining how operational efficiency affects commercial bank financial performance where descriptive results entailed the means, standard deviations, minimums and maximums. The Average operational efficiency was 0.310406. Lowest operational efficiency ratio was 0.01097 and highest operational efficiency ratio was 0.991743. The standard deviation was 0.213613 implying that operational efficiency varied across banks. Efficient commercial banks are able to allocate and use their resources effectively in line with business needs. Operational efficiency determines the solvency state of a bank. The findings concur with Ogboi *et al.* (2013) who analyzed how credit risk impacted Nigerian bank performance during the time period 2004-2009 and noted that operational efficiency is positively and significantly related to bank's financial performance using ROE. The competitiveness in utilizing resources among commercial banks is dependent on operational efficiency of the bank. Operational efficiency helps overall managerial efficiency of banks impacting bank performance. The findings concur with Itumo (2013) who noted that operational efficiency significantly and positively impacts commercial bank's performance.

The fifth objective assessed how money supply moderates the nexus that exist between liquidity risk factors and commercial bank financial performance where descriptive result output entailed means, standard deviations, minimums and maximums. Quantified mean of money supplied in the economy was KES 895.9 billion. Lowest money circulating in the economy was KES 678 billion whereas highest money circulating in the economy was KES 2197.8 billion. The Std. Dev was KES 769 billion implying that money circulating in the economy was varying during the measurement period. The quantity of the money circulating in the economy is a significant measure of fiscal policies. Nonetheless, basing on a study by Mulwa (2015), fiscal policy mechanisms shows insignificant impact of money supply on commercial bank financial performance. Central Bank of Kenya via Open Market Operations, engage in purchasing and selling securities with intention of regulating money circulating the economy. As CBK purchases the securities, it increases commercial banks money reserves allowing them to increase the amount of loans available for award. Descriptive output revealed that average ROE was 0.13335. The lowest return on equity was -0.908 while a bank with highest ROE is 0.494. Negative ROE implies that the bank paid equity to shareholders though it made losses. Positive ROE of 0.494 implies that the bank was performing very well in terms of ROE. The Std. Dev. was 0.19331 implying that ROE was varying across the banks.

4.2 Inferential Results

Inferential results entailed correlation matrix, panel models and test for moderation.

4.2.1 Correlation Analysis

Correlation analysis facilitated in determining the strength of association among variables. Correlation results are depicted in Table 2.

Table 2: Correlation Matrix

	ROE	Bank size	Capital adequacy	Asset quality	Operational efficiency
ROE	1.000				
Asset quality	-0.412	1.000			
sig. p-values	0.047				
Bank size	0.509	0.176	1.000		
sig. p-values	0.000	0.005			
Capital adequacy	0.253	0.047	0.406	1.000	
sig. p-values	0.000	0.485	0.000		
Operational efficiency	0.467	0.093	0.713	0.317	1.000
sig. p-values	0.000	0.136	0.000	0.000	

The results presented in Table 2 indicate that asset quality and commercial bank financial performance have a negative and significant association (r=-0.412, p=047). Asset quality entails the assessment of bank's assets with aiming of understanding the risks each asset possesses. This act allows the bank to segregate customers based in their ability to repay loans. These findings concur with Vong et al, (2009) who studied commercial bank-specific factors and commercial bank profitability using ROA in Macao during the period 1993 to 2007 and revealed that asset quality negatively and significantly relate to commercial bank performance using ROA. Asset quality helps assess worthy customers who request loans and are likely to repay back. Nonetheless, Mburu (2017) established that asset quality insignificantly relates to commercial banks performance using ROE.

Bank size and commercial bank financial performance are positively and significantly associated (r=0.509, p=000). Big banks stand better chances by their strength in terms of economies of scale in mobilizing resources, cut down costs, and improve operational efficiency with aim of generating profits. Though mixed results on the impact of bank size on firm performance are evident. With considerable economies of scale, bank size can positively impact firm performance. Likewise, bank size may result to loss because of inefficiency in mobilizing resources. The findings concur with Buyinza (2010) who established that size of bank has a positive and significant relationship with financial performance using ROE. According to Kwakwa (2014) size of bank positively influence ROE though the relationship was statistically insignificant. The efficiency of a bank to mobile resources impacts bank performance.

Capital adequacy has a positive and significant association with commercial bank financial performance using ROE (r=0.253, p=000). Capital adequacy is a significant solvency measure used as a safety net in protecting depositors' money. Capital adequacy expresses the ability of the bank to manage liquidity risks and make prudent financial decisions regarding bank's liquidity position during financial crisis. Capital adequacy is also essential in setting prices of bank services and product thus impacting revenue returns. The results agree with Ogboi and Unuafe (2013) who established that capital adequacy has a significant and positive linkage with financial performance of Nigerian commercial banks. The bank's capital helps to maintain

depositors' safety of their funds. Based on Almazari *et al.* (2017), bank size is positively related to the financial performance using ROE.

Operational efficiency and commercial bank financial performance had a positive and significant association (r=0.467, p=000). Operational efficiency connotes the ability of a bank to effectively mobilize resources to generate profits a bank operating effectively is able to channel its resources in the right manner increasing revenue generation. In the same way, operational efficiency in the bank enhances service delivery expanding customer base. The findings concur with Afriyie (2011who established that operational efficiency positively and significantly influence commercial bank financial performance using ROE. Operational efficiency entails effective, prudent use of resources in a manner that generates profit to the bank. As per Ndolo (2015), operational efficiency has a positive relationship with bank performance using ROA as measure of profitability.

4.2.2 Panel Regression Results

Panel model using regression coefficients were employed to depict how capital adequacy, asset quality, bank size, operational efficiency impact commercial bank financial performance. Model output is shown in Table 3.

Table 3: Panel Regression Results

Variable	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
Asset quality	-0.55404	0.096081	-5.78	0.000	-0.74335	-0.36672
Bank size	0.097155	0.025873	3.76	0.000	0.046445	0.147864
Capital adequacy	0.2129	0.046615	4.57	0.093	0.46106	0.035259
Operational efficiency	0.14444	0.065837	2.19	0.028	0.27348	0.0154
_cons	0.73975	0.294257	2.51	0.012	1.31649	0.16302
R-sq:	within = 0.4717					
	between = 0.5440					
	overall = 0.4255					
Wald chi2(4) =	144.46					
Prob > chi2 =	0.0000					

Panel model showed that size of bank, capital adequacy, asset quality and operational efficiency are adequate predictors of commercial bank financial performance as indicated by R^2 of 0.4255 implying that size of bank, capital adequacy, asset quality and operational efficiency explain 42.55% of commercial bank financial performance using ROE. The findings concur with the findings of Meshak and Nyamute (2016) who revealed that liquidity risks significantly influence commercial bank financial performance. The overall model was statically significant since the F-value of 144.46 is more than f-critical of 5.37 hence the model is statistically fit. From the model, size of bank, capital adequacy, asset quality and operational efficiency adequately predicts bank performance. In addition, the p-value 0.000< 0.05 hence this model was fit. As in line with results by Olongo (2013), commercial banks have to continue operating even during rising liquidity risks.

It was established that coefficient of asset quality negatively and significantly impacts commercial bank financial performance (β =-0.55404, p=0.000<0.05). The results imply that as asset quality increases by one-unit would lead to the decline of financial performance using ROE of commercial banks by 0.55404 units. The hypothesis tested was that asset quality has no significant effect on financial performance of commercial banks in Kenya. Regression in Table 3, shows that the probability value calculated is 0.000<0.05 hence the null hypothesis

was rejected and conclusion made that asset quality significantly impacts bank performance. Asset quality involves the assessment of bank's assets with aiming of understanding the risks each asset possesses. Asset quality ensures that loans are awarded to credit worth customers who can repay the loan. The assets impacted by asset quality state of bank include current and fixed and credit portfolio.

Loans are traded by commercial banks to earn interest rate. However, bad loans expose commercial banks to huge losses. Commercial banks have to keep checking borrowers' delinquency level because bad loans undermine the creation of equity value to shareholders. The results concur with Liu (2011) who investigated how CAMEL model impacts performance of Chinese financial banks and establish that asset quality significantly and negatively impacts profitability of Chinese commercial banks. In addition, the results agree with Lucky and Nwosi (2015) that asset quality significantly impacts financial performance of commercial banks measured using ROE. According to Nazir (2011) asset quality determines bank's the state of the loan portfolio quality. However, the results do not agree with Cheruiyot (2015) who showed that asset quality positively influences ROE of commercial banks in Kenya. Bad loans endanger the liquidity state of a bank a phenomenon that may lead to bank closure and eminent collapse.

In addition, model results showed that bank size has a positive and significant effect on commercial bank financial performance in Kenya ($\beta=0.097155$, $p=0.000<0.05$). The results signified that a unit increase in the assets controlled by bank results to 0.097155 units increase in the financial performance of commercial bank. The hypothesis that bank size has no significant effect on financial performance of commercial banks in Kenya was tested. The probability-value calculated is $0.000<0.05$ hence hypothesis was rejected and conclusion made that size of a bank in terms of total assets significantly impacts commercial bank financial performance. The study noted that large banks stand better chances by their strength in terms of economies of scale in mobilizing resources, cut down costs, and improve operational efficiency with aim of generating profits. Though mixed results on the impact of bank size on firm performance are evident. With considerable economies of scale, bank size can positively impact firm performance. Likewise, bank size may result to loss because of inefficiency in mobilizing resources. These findings concur with the findings of Jha *et al.* (2012) who established that size of bank significantly predicted bank performance measured using ROE. Nonetheless, the output does not agree with Aladwan (2015) who noted that smaller banks financially perform better in comparison to large commercial banks. Thus, the size of a bank in terms of assets it controls is essential in understanding financial growth and sustainability of financial banks.

The study found capital adequacy is positively and insignificantly related to financial performance ($\beta=0.2129$, $p=0.093>0.05$). The results imply that a unit rise in capital adequacy results to 0.2129 units increase in the performance of commercial banks using ROE. The hypothesis that capital adequacy has no significant effect on financial performance of commercial banks in Kenya was tested. Regression results indicated that the p-value calculated is $0.000>0.05$ hence hypothesis under consideration was not rejected and conclusion made that capital adequacy is not significantly related to bank performance. Adequacy of capital is operationalized using capital adequacy ratio (CAR). CAR connotes the ability of the bank to survive in the event of financial crisis. CAR thus portrays the resilience of a bank during crisis. It also enables commercial bank expand into new areas of business that are deemed to be variable.

Capital adequacy shows the capacity of a bank in paying for its liabilities and financial risk including credit and operational risk. CAR cushions commercial bank against liquidity risk

arising from bad loans. The results concur with those of Umoru *et al.* (2016) who found that asset quality significantly impacts bank performance. Results contrast with those of Trabelsi (2015) who established that capital adequacy positively and significantly impacts ROA and ROE of Islamic banks. The results also contrast that of Ezra (2013) that capital adequacy positively and significantly impacts profitability of banks. Capital adequacy measures bank's ability to pay for its obligation and cushion itself against precedent losses. Capital adequacy aims to protect customers money held deposits in the event of eminent collapse of the bank.

Coefficient of operational efficiency was found to be positively and significantly related bank performance (β=0.14444, p=0.028<0.05). The results signified that a unit improvement in operational efficiency results to 0.14444 units in bank performance. Regression results showed that the p-value calculated is 0.028<0.05 hence the hypothesis that operational efficiency has no significant effect on financial performance of commercial banks in Kenya was rejected and conclusion made that operational efficiency impacts bank performance. High unit expenses among some commercial banks compel them to seek for greater margins to offset their escalating operational costs. Greater operational efficiency enables commercial banks lower interest margin by promoting more deposits through lower loan rate. Operational efficiency is critical in running a healthy progressive financial institution. It entails prudent utilization of use of firm assets to create wealth to the stakeholders.

4.2.3 Impact of Money Supply as moderator on the relationship between liquidity risk and financial performance of commercial banks

Money supply was employed to moderate effect of liquidity risk factors on commercial bank financial performance in Kenya. The predictor variables were interacted with money supply to yield composite function also known as interaction term. Table 4 shows results after introducing the moderator.

Table 4: Moderating effect of Money Supply

Variable	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
Asset quality*	-0.05344	0.009297	-5.75	0.000	-0.07167	-0.03522
Bank size*	0.005365	0.001947	2.76	0.006	0.00155	0.00918
Capital adequacy*	0.02527	0.012348	2.05	0.041	0.04948	0.00107
Operational efficiency*	0.02235	0.00589	3.79	0.000	0.03389	0.0108
_cons	0.65756	0.24998	2.63	0.153	0.084751	0.132392
R-sq:	Within = 0.5083					
	between = 0.5744					
	overall = 0.43623					
Wald chi2(4) =	154.37					
Prob > chi2 =	0.0000					

Table 4 shows how money circulation moderates' effect of liquidity risk factors on commercial bank financial performance in Kenya. Coefficient of determination R^2 rose from 0.4255 (Table 3) to 0.43623 after introducing the moderator. The null hypothesis was that money supply does not significantly moderate the relationship between liquidity risk and financial performance of commercial banks in Kenya. Based on the findings of the study, the hypotheses were rejected and conclusion made that money circulation in the economy moderates the relationship between liquidity risk factors and bank performance. The quantity of the money circulating in the economy is a significant measure of fiscal policies. Nonetheless, basing on a study by Mulwa (2015), fiscal policy mechanisms show insignificant impact of money supply on commercial bank financial performance. Central bank of Kenya plays the role of controlling

the money circulating in the market and this act impacts amount of money available for loaning among the commercial banks.

5.0 CONCLUSIONS

The study concluded asset quality negatively and significantly influences bank performance. Asset quality can be determined by looking at loan loss provisions, loan advances and NPLs. Asset quality ensures that loans are awarded to credit worth customers who can repay the loan. A conclusion was further made that coefficient of bank size positively and significantly impacts bank performance. The efficiency and effectiveness of a bank in converting assets into profits is linked to the amount of assets it controls. It was also concluded that coefficient of capital adequacy positively but insignificantly relates to commercial bank financial performance. Capital adequacy measures bank's ability to pay for its obligation and cushion itself against precedent losses. Capital adequacy aims to protect customers money held deposits in the event of eminent collapse of the bank. Capital adequacy act as a safety net of protecting depositors in case the bank collapses or goes out of the market through avoidance and hedging.

The study further concluded that coefficient of operational efficiency has a positive but insignificant relationship on financial performance of commercial banks. Operational efficiency connotes the bank's ability to effectively mobilize resources to generate profits a bank operating effectively is able to channel its resources in the right manner increasing revenue generation. Efficient commercial banks are able to allocate and use their resources effectively in line with business needs. Operational efficiency determines the solvency state of a bank. The study further concludes that money supply circulating in the economy impacts the relationship between liquidity risk factors and bank financial performance. The quantity of the money circulating in the economy is a significant measure of fiscal policies. Money supply is used as proxies for monetary policy. The CBK through Open Market Operations, engage in purchasing and selling securities with intention of regulating money circulating the economy. As CBK purchases the securities, it increases commercial banks money reserves allowing them to increase the amount of loans available for award.

6.0 RECOMMENDATIONS

The study recommended commercial banks in Kenya need to diversify their investment in other lines of business so as to expand the income earned. The study further recommended that commercial banks may need to prudently allocate and utilize their resources in line with business needs and objectives. The banks need to undertake a critical assessment of borrowers on their ability to repay loans before awarding to minimize the cases of high nonperforming loans. The credit policies defined and implemented by the commercial banks need to be aligned to business objectives, level of profits expected. Bank management need to set policies and procedures that encourage and promote a high level of operational efficiency. The banks can invest on financial technologies to improve operational efficiency. Therefore, these results imply that bank management should focus and monitor their operational efficiency and ensure higher operational efficiency. The regulator should ensure that regulatory prudential guidelines on operational efficiency are adhered to in order to protect the interest of the investors.

The study recommended that CBK need to periodically assess the money market situation so to decide when to pump more money to the economy or retract with aim of stabilizing the liquidity of the banking system. Commercial banks need to hold sufficient capital since it is an enhancer of firm profitability. There should be a wide capital base in the banks to strengthen

confidence of depositors. Capital adequacy act as a safety net of protecting depositors in case the bank collapses or goes out of the market. Credit functioning system of the bank need to be periodically looked into to ensure that it correlates with the changing business environment poised by the rise of financial technologies. Further, the study recommended that that the commercial bank management should make investment in more assets to ensure that their institutions grow in terms of assets since large banks enjoy the economies of scale.

Bank management may need to define credit policy frameworks to ensure that customers' deposits are awarded to worth business investments and customers who stand better position to repay the principal amount and interest accrued. In addition, sound credit culture needs to be cultivated among customers through financial training and advisory on how to use the borrowed funds. Improper credit risk management mechanism limits the ability of a bank to generate more interest income from loans issued out, impacts the quality of assets escalating loan losses and NPLs resulting to financial distress among the affected banks.

Moreover, the study recommended the implementation of financial technologies for instance predictive modeling to check credit worthiness of borrowers to ensure that high value of non-performing loans is minimized. Further, commercial banks need to put more effort in minimizing credit risks by enhancing business diversification. Improperly managed credit risks result to rising cases of loan defaults, more cases nonperforming loans that adversely impact the profitability margins of the commercial banks. The commercial banks have to work hand to hand with CBK to control flow of money in the economy. For instance, when the Central Bank buys securities on the open market, it increases the reserves of Commercial banks, making it possible for them to expand their loans which increase the money supply.

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