

# LIQUIDITY RISK MANAGEMENT ON FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA

Aloys Jared Oganda<sup>1</sup>, Vitalis Abuga Mogwambo<sup>2</sup>, Simeyo Otieno<sup>3</sup>

<sup>1</sup>Tutorial Fellow, School of Business and Economics, Jaramogi Oginga Odinga University of Science and Technology, Kenya

<sup>2</sup>Lecturer, School of Business and Economics, Jaramogi Oginga Odinga University of Science and Technology, Kenya;  
Email: mogwambov@yahoo.com

<sup>3</sup>Lecturer, School of Business and Economics, Jaramogi Oginga Odinga University of Science and Technology, Kenya;  
Email: simeyoous@yahoo.com

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**Abstract:** The banking sector in Kenya has experienced liquidity challenges ranging from funding to market risks. This research focused on the effects of asset management and deposit management on performance of commercial banks in Kenya. The specific objectives were; to establish the effect of customer deposits and asset base on performance of commercial banks in Kenya. Shiftability theory and Modern portfolio theories were used. Correlational research design with a comparative analysis approach was adopted. The target population was two commercial banks and document analysis guide was used to gather quantitative data from the banks financial statements through 2007 to 2016. The study found that deposits had a negative and significant effect on performance of both banks while asset base had a positive relationship. The study therefore recommends commercial banks to be aggressive in identifying viable ways to invest the customers' deposits to generate income and management of commercial banks should improve the volume and value of assets at its disposal by looking for means to acquire additional assets since assets generate revenues to the commercial banks.

**Keywords:** banking sector, liquidity challenges, market risks, commercial banks.

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## 1. INTRODUCTION

Commercial banks ease transactions carried out by economic agents by financing their activities to promote economic growth and development (Horvath, Seidler, & Weill, 2014) and therefore, effective liquidity risk management through asset and deposits management helps ensure the ability of a bank to meet its obligations as they fall due and reduce the possibility of an adverse situation developing (Kumar & Yadav, 2013). Risk management in financial institutions gained more attention after the 2007/2008 global financial crisis in which banks, stock markets and large financial institutions collapsed which triggered the governments across the world recognize the impact of ineffective risk management in their financial systems. Risk control practices were devised which resulted to the introduction of BASEL Norms by the Bank of International Settlements Committee. The main areas of focus was on operational, credit and liquidity aspects which help banks to quantify their risks and apply the appropriate risk management mechanism (Vaidyula & Kavala, 2013).

Liquidity risk management is a two practice whose outcome conflicts; to begin with, an inadequate level of liquidity may trigger the search for alternative funding sources which is accompanied with administration costs and the accompanying expenses of servicing the funding source to retire the debt. These additional costs reduce profitability and could ultimately

result in insolvency. Conversely, excessive liquidity may lead to a decrease in ROA as the excess liquidity held is not generating any return to the bank because it is lying idle in the bank thus poor financial profitability (Iion and Dragos, 2006). Van and Iqbal (2008) and Iqbal and Mirakhor (2011) postulate that a comprehensive framework for risk management is equally applicable to both conventional and Islamic bank.

The growth of the Kenyan banking sector declined from 7.8% in 2011 to 6.5% in 2012. Its contribution to GDP decreased from 6.3 per cent to 5.2 per cent over the same period (KNBS, 2013) while its assets, excluding capital markets rose from 85.66% of GDP in December 2013 to 88.41% in 2014 but declined to 83.27% in 2015 (Financial Stability Oversight Annual Report, 2015). Banks do not have a lot of their own money to give as loans, they depend on customers deposits to generate funds for granting loans to other customers. Commercial banks that have a large asset size are able to expand their operations geographically to regions where competition is not very high or to regions where the market is largely untapped. Such a move would increase the customer base of the bank in a significant manner and this would also lead to increased customer deposits (Goddard, Molyneux & Wilson, 2004).

### 1.1 Objectives of the Study

- i. To assess the effect of customers deposits on performance of commercial banks in Kenya.
- ii. To determine the effect of asset base on performance of commercial banks in Kenya.

### 1.2 Hypotheses of the Study

$H_{01}$ : There is no significant effect of customer deposits on performance of commercial banks in Kenya.

$H_{02}$ : There is no significant effect of asset base on performance of commercial banks in Kenya.

## 2. LITERATURE REVIEW

### 2.1 Sources of liquidity risk for banks

Liquidity risk is the likelihood that a bank will face difficulties and inability to settle their obligations when required. (Drehmann & Nikolaou, 2009). The exposure of banks to liquidity risk is determined by the funding risk and market risk. The funding liquidity risk is caused by the maturity mismatch between inflows and outflows and/or the sudden and unexpected liquidity needs due to contingency conditions. The market liquidity risk refers to the inability to sell assets at or near the fair value, and in the case of a relevant sale in a small market; it can emerge as a price slump (Brunnermeier & Pedersen, 2009).

The amount and frequency of withdrawals by depositors and a renewal of rolled over loans between commercial banks are a major source of uncertainty on the liability side. This is especially so when the bank is under suspicion of insolvency, when there is a temporary shortage of liquidity or when the economy undergoes a macroeconomic shock. On the assets side also, there is some uncertainty on the size of new requests for loans to expect or renewal of existing loans. The bank could refuse to grant these new loans and lead to the contraction of profit due to the foregone interest income. Off-balance sheet operations are a significant source of liquidity risk for banks such as credit lines and other commitments (Rochet, 2008).

### 2.2 Measures of Liquidity Risk and Liquidity Ratios

Up to the present, there is no specific measure of bank liquidity risk because no single parameter provides a comprehensive view. In the past, best practices for liquidity risk measures focused on the use of liquidity ratios. However, Poorman and Blake (2005) indicated that measuring liquidity risk just using liquidity ratios is not adequate and hence, banks need develop a new view of liquidity risk measurement. Based on the existing literature, most studies used liquidity ratios as the measurement for liquidity risk, but this study utilized cash reserves, deposits, non – performing loans and asset base. Erik Banks (2005, p.143,146) indicate the application of liquidity ratios by various financial institutions in relation to their normal operations; they are grounded to some extent on diverse different classifications even though they are applied in quantifying liquidity risks of financial institutions as indicated in Table 2.1.

**Table 2.1: Formulae for Liquidity ratio of financial institutions**


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<b>Borrowing Ratio 1 = Total Deposits / Total Funds</b>
<b>Borrowing Ratio 2 = Volatile Funds / (Cash + Marketable Securities)</b>
<b>Borrowing Ratio 3 = (Volatile Funds - Current Assets) / (Total Assets - Current Assets)</b>
<b>Loan to Deposit Ratio = Total Loan / Total Deposits</b>
<b>Loan to Assets = Total Loans / Total Assets</b>
<b>Cash Liquidity Ratio 1 = Cash / Total Assets</b>
<b>Cash Liquidity Ratio 2 = (Cash + Short-term investments + Funds sold) / Total Assets</b>
<b>Cash Liquidity Ratio 3 = Marketable Securities / Surrenderable Liabilities</b>
<b>Cash Liquidity Ratio 4 = 30-day Saleable Assets / Surrenderable Liabilities</b>

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Source: Liquidity Risk: Managing Asset and Funding Risk from Erik Banks, (2005, p.146)

## 2.3 Managing Liquidity risk

### 2.3.1 Customer deposits

Deposits are the lifeline of the banking business. Most operations of the bank utilize deposits. If depositors withdraw their money from the bank, it will create a liquidity trap for the bank, (Jeanne & Svensson, 2007) forcing the bank to borrow funds from the central bank or the inter-bank market at higher costs, (Diamond & Rajan, 2001). On the contrary, a bank having enough deposits in its account will not have the above-said problems. Deposit mobilization in the banking sector, is intended to encourage customers to deposit more cash with the bank to empower the bank to lend more loans and generate additional revenue for them, (Kazi, 2012). The main business of banks is accepting deposits and granting of loans. The more they lend, the more profitable they become. Banks depend on customers' deposits to generate funds for granting loans to other customers since they do not have a lot of their own money. Therefore, to improve its profitability, it is imperative for a bank to increase deposits. Gatev and Strahan (2003) inflow of funds give a natural hedge to banks for outflows due to loan advancements. Therefore, banks use deposits to mitigate liquidity risk.

### 2.3.2 Asset base

Banks have incentives to reduce risk and safeguard the valuable charter against financial distress and they also have incentives to increase risk to exploit the cost-of-funds subsidy of mispriced deposit insurance. These are contrasting incentives linked to bank size. Measuring performance of banks in relation to their size requires clarity about cost and profit from resolutions with regard to risk and return tradeoff since cost and profit are a result of decisions about risk versus expected-return because both cost and profit originate from risk taking in asset investments to create wealth. Expansion of operations improves risk taking due to diversifications and economies of scale derived from size. Empirical studies on banking cost controlling for the endogenous risk taking find large scale economies at the largest banks while banking cost that ignore endogenous risk-taking find weak evidence of scale economies at the largest banks; evidence with important implications for regulation (Joseph & Lorrettas, 2013).

Commercial banks that have a large asset size are able to expand their operations geographically to regions where competition is not very high or to regions where the market is largely untapped. Such a move would increase the presence of the bank in a wider geographical coverage through increased branch network hence enhancing the customer base of the bank leading to increase in customer deposits (Goddard, et al.,). Increased customer deposits would translate to high liquidity and hence the bank would meet its financial obligations, invest in technology and other input factors which increase the firm's efficiency in meeting its obligations and as well as its customer base (Murerwa, 2015)

## 2.4 Bank Performance

Financial measures are considered the most used parameter of business performance measurement, especially in the current economic climate. These performance indicators are important to the shareholders and depositors who are major beneficiaries of a bank. Profitability is the most important measure of success of a business and it measures the extent to which a business generates a profit from the factors of production; labor, management and capital. Most growing

businesses ultimately target increased profits. Bank profitability is the bank's ability to create revenue in excess of cost, in relation to its capital base. A sound and profitable banking sector contributes significantly to financial system stability as it is better placed to withstand negative economic shocks Brissimis, Athanasoglou, & Delis, (2005). Profitability and liquidity are indicators of corporate health and performance of commercial banks and all profit oriented ventures, (Eljelly, 2004). Profitability analysis focuses on the relationship between revenues and expenses and on the level of profits relative to the size of investment in the business (Mesquita & Lara, (2003). It is measured by ratios; ROA, ROE and NIM that summarize large quantities of financial data to make qualitative judgement on performance (Velnampy and Nireesh, 2012).

#### **2.4.1 Performance Measures**

The following measures are applicable for performance measurement;

##### **2.4.2 Return on Assets**

Return on assets (ROA) is an indicator of how profitable a firm is relative to its total assets and is often used as an overall index of profitability. It indicates management ability to perform their job efficiently since it shows the ability to generate profit from the assets of the bank. It is computed by dividing a company's net income after tax by its total assets. Sometimes ROA is referred to as return on investment (ROI). The higher the value of ROA, the better the performance and vice versa.

$$\text{ROA} = \frac{\text{Net income after tax}}{\text{Total assets}}$$

##### **2.4.3 Return on Equity**

The ROE measures the rate of return on the owner's equity employed in the firm's business. It is also necessary to consider ROE in relation to ROA to examine whether the firm is making profitable return on their borrowed money and creating wealth on it (Hadlock & James, 2002). ROE is the amount of net income after tax returned in relation to shareholders equity. It measures a corporation's profitability by revealing how much profit a company generates using shareholders money.

$$\text{ROE} = \frac{\text{Net income after tax}}{\text{Total shareholders' equity}}$$

##### **2.4.4 Net Interest Margin**

NIM indicates the profit earned by a bank on its lending. It is calculated as the difference between gross interest income and expenses as a percentage of earning assets. These earning assets are assets that earn interest income in a given time period and they include loans and receivables. The NIM reflects both default and interest rate risk premium in the market (Angbazo, 1997).

$$\text{NIM} = \frac{\text{Interest income} - \text{Interest expense}}{\text{Interest earning assets}}$$

Interest earning assets include Loans and advances to customers (net), government securities, deposits and placements with banking institutions.

#### **2.5.1 Interest Rates Framework**

Interest rate is the amount charged, expressed as a percentage of principal, by a lender to a borrower for the use of assets (Investopedia, 2017). The Banking amendment Act, which came into force on 14 September 2016 puts a ceiling on lending rates by banks and financial institutions at 4 percentage points above the CBR, and floor on term-deposit rates at 70 percent of the CBR. Consequently, following the implementation of the amended Act in mid-September 2016, the Monetary Policy Committee (MPC) suspended the Kenya Bankers Reference Rate (KBRR), previously used as the base rate for pricing of loans by commercial banks (KNBS, 2017). With the CBR currently at 10 percent, this implies a floor of 7 percent on term deposits and a ceiling of 14 percent on loans. Since the signing of the law, stock prices of Kenya's

biggest banks have fallen and a number of banks have announced cost-cutting measures, including layoffs, closure of branches, and cancellation of expansion plans (IMF, 2017). The interest rate cap has led to loss of deposits by smaller banks, as they are perceived to being risky to larger banks. Average savings rate by commercial banks grew by 262% in 2016 while lending rate decreased by 23% in the same period. (Deloitte, 2017).

### 2.5.2 Central Bank of Kenya

The Central Bank of Kenya as the regulator of commercial banks issues regulations and guidelines that foster transparency between banking institutions, individuals and other organizations with which they do business. The objective of these regulations is to protect depositors, reduce systematic risk, and avoid misuse of banks by protecting banking confidentiality in credit allocation (Central Bank of Kenya, 2016). The CBK also fosters the liquidity, solvency, and proper functioning of a market-based financial system in its supervisory functions as well as licensing all financial institutions and inspecting them to ensure that they comply with regulations and guidelines (Central Bank of Kenya, 2016). CBK was very important in ensuring timely and adequate liquidity distribution among all banks in the first half of 2016 following instability witnessed in the last quarter of 2015 and first quarter of 2016 (Financial Stability Oversight Annual Report, 2016).

## 2.6 Theoretical Literature Review

### 2.6.1 The Shiftability Theory of Liquidity

This theory was formally developed by Harold G. Moulton (1918) in USA; the theory postulates that banks could most effectively protect themselves against massive deposit withdrawals by holding, as a form of liquidity reserve, credit instruments for which there exists a ready secondary market. This theory further holds that highly marketable securities held by a bank are excellent sources of liquidity. Such liquidity reserves are commercial paper, prime bankers' acceptances and treasury bills. Under normal conditions all these instruments meet the tests of marketability and, because of their short terms to maturity and capital certainty. Thus, banks rely on assets that can be transferred to other banks before maturity to meet its cash requirements (Summers, 1975). Therefore, shiftability, marketability and transferability of the assets of a bank is a basis for enhancing liquidity (Ibe, 2013).

This theory has been criticized by various scholars that in period of distress, it may be difficult to shift the credit instruments into cash as the market confidence would be seriously affected and thus credit worthiness would be lacking (Maaka, 2013). This theory is relevant to this study because commercial banks try to keep up sufficient funds to meet the unexpected demands from depositors (Majid, 2003) and holding sufficient liquidity is necessary to insure against liquidity risk (Diamond & Rajan, 2001) but maintaining the cash is extremely expensive (Holmstrom & Tirole, 2000). The limitation to the commercial banks maintaining large cash reserves may not only be the loss of a number of opportunities in the market but also the high cost associated with holding cash reserves. Thus there is need of commercial banks to balance this act by adopting a viable and appropriate cash management model.

### 2.6.2 Modern Portfolio Theory

Modern portfolio theory attempts to maximize expected return for a given amount of portfolio risk, or equivalently minimize risk for a given level of expected return, by carefully choosing the proportions of various assets. This theory posits that firms select investments based on discounted future expected returns. Firms should therefore diversify across industries and asset classes to minimize exposure to risk. It aims at balancing the risk – return tradeoff by having a balanced portfolio. Finance managers have used the theory to build a balanced asset portfolio through the financial planning process of securing and employing capital resources on assets that will generate optimal returns (Harry Markowitz, 1952).

The fact that banks have usually large numbers of undertakings means that they have potential buyers of other bank and or non –bank related services like insurance, bank assurance, stock brokerage, factoring, asset management and other services. Thus banks should choose viable ways of investing in assets that will enhance and maximize profitability on financial performance in relation to the asset base.

## 2.7 Empirical literature review

### 2.7.1 Customer Deposits

Deposits provide a natural hedge to banks against the liquidity risk. Under the stressed market conditions, banks are perceived as a haven for investors who do not intend to issue funds against their loan commitments (Gatev and Strahan 2003). Cash flows in any bank complement each other and inflow of funds give a natural hedge to banks for outflows due to loan advancements. Therefore, banks use deposits to hedge the liquidity risk. This argument finds support from the work of Kashyap *et al.* (2002) who provided a rationale of risk management to define the features of a commercial bank, commonly labelled as “financial intermediary” combining demand deposits with loan commitments.

Arif & Anees (2012), studied Liquidity risk and performance of banking system in Pakistan focusing on conventional banks. Unstructured interviews were used to gather primary data while secondary data from annual reports was extracted for 22 banks covering a period of 6 years from 2004 to 2009 and used a correlational research design. The study found that increase in deposits boosts a bank’s earnings as this places the bank in a better position to generate more interest income by advancing these deposits to customers to earn interest. This study concluded that liquidity risk may be mitigated by raising the deposit base as this will make the bank more liquid and in a better position to meet its obligations conveniently and avoid overnight borrowing and its associated costs as well as helping banks to avoid fire sale risk. The recommendation to increase deposits did not factor the interest to be paid by the bank to depositors of these funds and as well ignored the fact that depositors may decide to withdraw their deposits unexpectedly and subject the bank into a liquidity problem. Therefore, this study will fulfill this gap by recommending on more stable funding sources to banks like increase in retained earnings.

Naceur and Goiaed (2001) studied determinants of Tunisian banks' performance for the period 1980-1995 found that the best performing banks are the ones which maintain high level of deposits relative to their assets. Increasing the ratio of total deposits to total assets causes increase in funds available for use by the bank in different profitable ways such as investments and lending. Ratnovski and Huang (2009) study on Why Canadian banks were more resilient compared to other large commercial banks in OECD countries during the 2008 economic turmoil found out that it was a result of relying more on depository funding as compared to the other banks that relied more on wholesale funding.

Maaka (2013), study on the relationship between liquidity risk and financial performance of commercial banks in Kenya using Correlation research design covering a five year period between 2008 - 2012 found a positive relationship between the level of customer deposit and bank’s profitability, meaning the more the deposits a commercial bank is able accumulate, the greater is its capacity to lend more and make profits. This study concluded that liquidity risk may be mitigated maintaining sufficient cash reserves and raising deposit base. The study used secondary data and thus faced the limitation being obsolete since in our rapidly changing environment, information becomes quickly outdated. On the contrary, if the demand for bank loans is low, having more deposits could decrease earnings resulting in low profit for the banks. This is because deposits like fixed deposits attract high interest from the banks to the depositors, (Devinaga, 2010).

Okun (2012), studied the effect of level of deposits on financial performance of commercial banks in Kenya using a descriptive research design methodology and secondary data of 8 years from 2004 through to 2011. The study used ROA and ROE as proxies of financial performance and found that there exist a positive and significant relationship between deposits and bank performance since deposits play a pivotal role in funding of a bank’s assets and they influence profitability through intermediation. This study concluded that deposits seem to maximize shareholders wealth and those banks should put in place effective strategies to attract deposits through offering higher deposit rates and embrace innovations such as MPESA and agency banking to attract deposits at lower costs thus reporting better ROA and ROE in the future.

Tom (2015), studied the effect of liquidity on profitability of commercial banks in Kenya using a descriptive research design approach over a period of 5 years from 2010 to 2014. Secondary data was used and it was found out that liquidity has a positive effect on profitability of commercial banks. The study concluded that if Liquidity problems are not addressed at the earliest opportunity, depositors demands may prove difficult to meet, bank’s profitability and capital

would be impaired and in extreme circumstances, it may cause the collapse a bank and recommended that liquidity risk may be mitigated by raising deposit base and decreasing the liquidity gap. Raising deposit base is also associated with interest to be paid to depositors which could be costly to the bank, thus this study sought to shed light as to the level deposit base to hold considering the need to diversify the revenue to the banks as well as the need for a bank to rely on more stable internal funding sources rather than relying on deposits which are uncertain since the customer may withdraw their deposits when they are in need of funds.

Customer deposits have a significant and negative effect on earnings of banks since holding cash is associated with an opportunity cost Nafula (2003). Local studies are still insufficient because of their failure to single out deposits in their studies of performance of commercial banks. Kiragu (2010) reviewed the relationship between the capital adequacy and the profitability of banks in Kenya but failed to address the role of deposits in bank performance. Mwachhi (2009) conducted a study on the relationship between commercial banks financial performance and their ownership structure but failed to relate the level of deposits to the performance of commercial banks. This implies that local studies are yet to adequately cover the subject of the effects of customer deposits on performance of commercial banks in Kenya.

### 2.7.2 Asset base

Liu (2013), study on determinants of profitability of the United States of America banking industry during the financial crisis focusing on both internal and external variables regarding profitability of banking sector, including bank-specific variables, industry specific variables and macro economy variables using panel data over the period 2007-2012 found a significant positive relationship between bank size and profitability as banks can take advantage of the economies of scale during the financial crisis and because large banks have more diversified portfolios and earn higher profits during recessions. Furthermore, the researcher divided the banks sampled by their asset size from small to large and found that banks with largest asset size have a significantly positive relationship with profitability while banks with smallest asset size have negative relationship with profitability. These findings prove that larger banks are more profitable than smaller ones. Therefore, large banks benefit from economies of scale and cost economies with cost per unit generally decreasing with increasing scale. Operational efficiency of banking is also greater with increasing scale, leading to lower variable cost and high profitability as well. Thus banks with larger asset size would bring confidence to depositors and encourage the investors.

Athanasoglou, Brissimis & Delis (2008), studied bank-specific, industry-specific and macroeconomic determinants of bank profitability in Greece using unbalanced panel data covering 1985 to 2001. The study found that all bank-specific determinants affect bank profitability significantly while effect of bank size on profitability is insignificant and that size does not provide economies of scale in banking since as the bank size expands, the asset base grows and they may become too complex to manage because of bureaucratic or other reasons resulting to diseconomies of scale.

Aladwan (2015), study on the impact of bank size on profitability; an empirical study on listed Jordanian commercial banks using secondary data covering the years from 2007 to 2012 and classified the banks into three categories according to their asset size, in respect to their total Assets. The study found a statistically significant negative effect of asset size on bank profitability and concluded that size effect exists. Small and medium sized banks exhibits higher overall performance compared to large banks and the smaller the bank assets are, the higher is its profitability. The study recommended on further research to be conducted by classifying banks in the current size in proportion to their differences in profitability, liquidity, or capital adequacy.

Naifer (2010) studied the determinants of bank performance: an analysis of theory and practice in the case of an emerging market. Pooled time-series and cross-section data was used from the financial statements. The study found that the effect of bank size on profitability is not significant because the Tunisian banking system is characterized by small-sized banks compared to banks in developed market. Then, they try to grow faster, even at the expense of their performance. They put better emphasis on increasing their market share, rather than on improving profitability. The study recommended Tunisian banks to make an effort to attain an appropriate size, by considering mergers among national and international banks to enjoy profitability and associated economies of scale. This study ignored the costs associated with mergers as well as the huge compensation to be given to the laid off managers during merger which could have negative effect on profitability.

Hadad (2013), studied the factors that affect the financial performance of Naara rural banks in the upper east region of Ghana. The researcher used the annual financial statements covering 11-year period between 2000 and 2010. Multiple regression analysis was used as the main statistical tool to analyze the data collected from the banks under the study. The research sought to establish empirical relationship that existed between Naara rural banks financial performance on one hand and its credit portfolio, liquidity, NPLs and total assets on the other hand. The findings of the research indicated that liquidity and size were positive and related considerably to the performance of the bank.

Ezra (2013), study on the determinants of commercial banks profitability in SSA using an unbalanced panel of 216 commercial banks drawn from 42 countries in SSA for the period 1999 to 2006, employed the random effect panel methods to estimate bank profitability. Growth in bank asset, growth in bank deposit, capital adequacy, operational efficiency, liquidity ratio, growth in GDP and inflation were used as explanatory variables. The study found that the bank level variables such as capital adequacy and growth in bank deposits have positive influence on bank profitability while growth in bank assets, operational efficiency and bank liquidity indicators have negative effect on bank profitability revealing that large commercial banks perform lower than smaller commercial banks.

Lukorito, Muturi, Nyang'au and Nyamasege (2014), studied the effect of liquidity on profitability of commercial banks in Kenya using a descriptive research design over 5 years from 2009 to 2013 relying on secondary data from the annual published financial statements. The study found out that liquidity has statistically significant and positive relationship to banks' profitability and recommended that banks should invest heavily in assets if substantial gains have to be realized, maintain adequate liquidity levels though in the form of short term marketable securities in order to realize profits and aggressively identify viable investment opportunities and link such opportunities to customer deposits.

Murerwa (2015), studied determinants of banks' financial performance in developing economies: evidence from Kenyan commercial banks using a descriptive research design methodology. The study utilized both primary and secondary data for 3 years from 2011 to 2013 and found that there exist a strong positive relationship between asset quality and ROA, ROE and NIM and concluded that firm specific factors have the ability to influence the financial performance of a firm, recommending that banks should increase investments in assets since a bank with more assets is able to make huge investments in technology and other input factors which increase the firm's efficiency in meeting its obligations and as well as its customer base.

Chege & Bichanga (2017), studied non-performing loans and financial performance of Banks: An Empirical Study of Commercial Banks in Kenya using descriptive survey and empirical research design. Secondary data from published financial statements covering 5 years from 2011 to 2015 was used. The study found that asset base, proxied by bank size has a statistically significant positive correlation with performance suggesting that an increase in asset base leads to an increase in the profitability of a bank. This study recommended commercial banks should improve the volume and value of assets at their disposal and find ways of acquiring additional assets since assets generate revenues to commercial banks. This study however did not focus on the additional costs that a bank may be exposed to by tying its funds in assets rather than investing in short term marketable securities. The study also ignored the effects of diseconomies of scale associated with expanding the asset base as well as lack of striking a balance on the portfolio of assets to invest in, hence this study addressed this gap by finding the optimal investment and asset allocation of a bank using modern portfolio theory.

The results by previous researchers have had no consensus on whether an increase in the size of the bank through increased assets provide economies of scale to commercial banks which eventually leads to the improved financial performance. This is therefore an issue that needs to be evaluated further through more studies. The size of the commercial bank or any other business entity in terms of the assets is a very significant determinant of profitability due to various issues. Commercial banks that have a large asset base are able to expand their operations geographically to regions where competition is not very high or to regions where the market is largely untapped. Such a move would increase the customer base of the bank in a significant manner and this would also lead to increased customer deposits (Goddard, et al., 2004). This study therefore tried to narrow the gap in the divergence of the results from previous studies.



## 2.8 Conceptual Framework

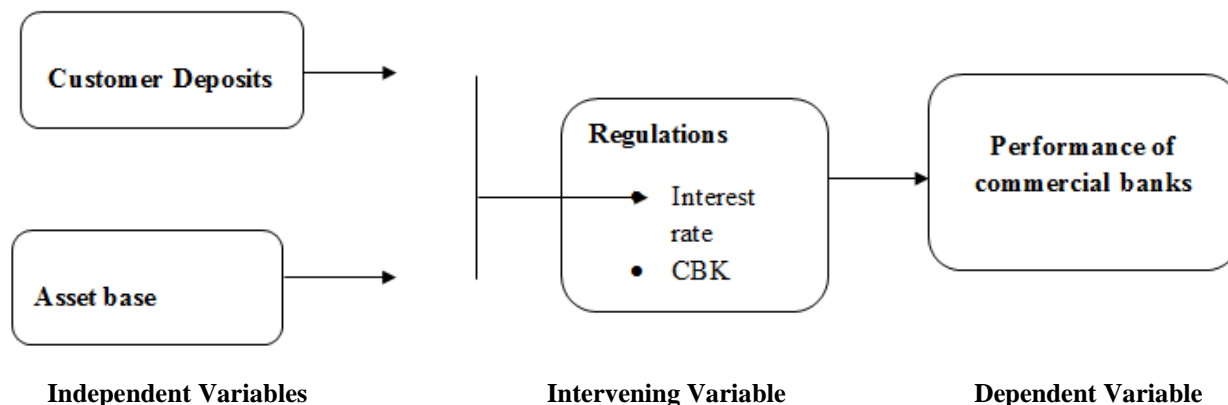


Figure 2.1: Conceptual framework

(Source: Researcher, 2018).

## 3. RESEARCH METHODOLOGY

The study was carried out in Kenya as the units of study have their head offices in Kenya with branches across the country. The study adopted a correlational research design with a comparative analysis approach which is quantitative in nature and utilized panel data for 10 years from 2007 to 2016. The target population for this study comprised of two commercial banks operating in Kenya. The choice of Equity bank was justified to have a focus on private bank operations while NBK was chosen due to the fact that it is a state owned bank and therefore, its operations are indirectly influenced by the government and therefore the element of private versus a public bank for comparability reasons. Secondary data obtained from the bank's annual reports using a document analysis guide. Data analysis was conducted using both descriptive and inferential statistics. SPSS Version 21 software was used to generate descriptive and inferential statistics and STATA Version 11 software was used to test for stationarity.

Data analysis was guided by the following model;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

Where, Y= Performance of commercial banks

$X_1$ = Customer deposits ( $t_1, \dots, t_n$ )

$X_2$ = Asset base ( $t_1, \dots, t_n$ )

$\beta_0, \beta_1$  and  $\beta_2$  are regression equation coefficients.

$\varepsilon$  = error term.

## 4. RESULTS AND DISCUSSION

### 4.1 Descriptive Statistics Analysis

Table 4.1: Customer Deposits and Bank Liquidity

	Statistics	Equity	NBK
	Mean	138.53	67.491
	Median	133.94	56.165
Customer deposits	Std. Deviation	81.8676	30.8281
	Variance	6702.3	950.373
	Minimum	31.54	34.35
	Maximum	277.28	112.97

Source: Research data (2018)

For customer deposits, Equity bank had a mean and median of 138.53 billion and 133.94 billion respectively. There is substantial variation in deposits as indicated by the standard deviation of 81.87 billion which translates to 59.10% of the mean of deposits. The bank had a maximum deposit level of 277.28 billion and a minimum of 31.54 billion. For NBK, the mean and median of deposits was 67.491 and 56.165 billion. The maximum deposit level was 112.97 billion and the minimum was 34.35 billion with a standard deviation of 30.8281 billion which is 45.68% of the mean of deposits. Deposits are the lifeblood of banking operations since they facilitate and form the major source of funds for lending in form of loans advanced to customers. This is expressed by the positive net interest margin value for the bank meaning the bank generated more interest income than the amount it paid as interest expense to depositors. Equity bank has more variability in customer deposits of 59.10% compared to NBK which had a variability of 45.68%.

**Table 4.2: Asset base and Bank Liquidity**

	Statistics	Equity	NBK
	Mean	198.88	78.711
	Std. Deviation	111.5817	32.74841
<b>Asset Base (Billions)</b>	Variance	12450.47	1072.458
	Minimum	53.13	41.41
	Maximum	379.75	125.3

**Source:** Research data (2018)

For the asset base component, Equity bank had a mean of 198.88 billion with a minimum and maximum of 53.13 billion and 379.75 billion respectively. There is high variation in the asset base as indicated with a standard deviation of 111.58 billion which is 56.10% to the mean of the assets. NBK has a mean asset base of 78.711 billion, a maximum and minimum asset base of 125.30 billion and 41.41 billion respectively. The bank has a high variation of asset base as shown by the standard deviation of 32.74841 billion which is 41.61%, slightly lower than the variation in Equity bank. Large asset base enables a bank to expand its operations geographically to regions where competition is not very high or to regions where the market is largely untapped. Such a move would increase the presence of the bank in a wider geographical coverage through increased branch network hence enhancing the customer base of the bank in a significant manner and this would also lead to increased customer deposits thus boosting the liquidity position of the bank.

#### 4.2 Normality test

The normality of data distribution was assessed by examining its skewness and kurtosis. The results in Table 4.3 show that the variables are normally distributed with skewness and kurtosis values ranging between -3.0 and + 3.0. This implies that the study items are normally distributed and hence further tests can be carried out on the data.

**Table 4.3: Normality test**

	Skewness	Kurtosis	Skewness	Kurtosis
	Equity Bank	Equity Bank	NBK	NBK
ROA	-0.681	0.117	-0.506	-0.801
Deposits (billions)	0.378	-0.893	0.531	-1.507
Asset base (billions)	0.307	-1.074	0.435	-1.564

**Source:** Research data (2018)

### 4.3 Unit root test

Table 4.4 and 4.5 shows the unit root test for ROA for Equity bank and NBK respectively. The header of the output summarizes the exact specification of the test and dataset. By default, LLC estimated the long-run variance of the dependent variables by using a Bartlett kernel with an average of 6.00 lags. The LLC bias-adjusted test statistic  $t^* = 0.0000$  and  $0.0002$  which is significantly less than 5% significant level and therefore we reject the null hypothesis of a unit-root in favor of the alternate hypothesis that the series is stationary. The unadjusted statistic diverges to negative infinity if trends or panel-specific constants are included, so a p-value is not displayed in those cases.

**Table 4.4: Levin-Lin-Chu unit-root test for ROA**

. xtunitroot llc ROA, trend lags(2)		
Ho: Panels contain unit roots	Number of panels =	1
Ha: Panels are stationary	Number of periods =	10
AR parameter: Common	Asymptotics: N/T ->	0
Panel means: Included		
Time trend: Included		
ADF regressions: 2 lags		
LR variance: Bartlett kernel, 6.00 lags average (chosen by LLC)		
	Statistic	p-value
Unadjusted t	-25.3135	
Adjusted t*	-24.0945	0.0000

Source: Research data 2018

**Table 4.5: Levin-Lin-Chu unit-root test for ROA**

. xtunitroot llc ROA, trend lags(2)		
Ho: Panels contain unit roots	Number of panels =	1
Ha: Panels are stationary	Number of periods =	10
AR parameter: Common	Asymptotics: N/T ->	0
Panel means: Included		
Time trend: Included		
ADF regressions: 2 lags		
LR variance: Bartlett kernel, 6.00 lags average (chosen by LLC)		
	Statistic	p-value
Unadjusted t	-6.1341	
Adjusted t*	-3.5487	0.0002

Source: Research data, 2018

The Fisher – type ADF and PP tests for ROA is presented in the tables 4.6 and table 4.7 for Equity bank and Tables 4.8 and table 4.9 for NBK whose results reject the null hypothesis and therefore the data is stationary thus will not give spurious regression results . LLC strongly reject the null hypothesis that all the panels contain unit roots at the 5% level of significance and therefore the series is stationary. Unlike LLC, the Fisher – type tests consider the parameter  $\pi$  for the autoregressive equation to vary across panels and therefore panel specific. Choi's (2001) simulation results suggest that the inverse normal Z statistic offers the best trade-off between size and power, and he recommends using it in applications. We have observed that the inverse logit  $L^*$  test typically agrees with the Z test. Under the

null hypothesis,  $Z$  has a standard normal distribution and  $L^*$  has a  $t$  distribution with  $5N + 4$  degrees of freedom. Low values of  $Z$  and  $L^*$  cast doubt on the null hypothesis. When the number of panels is finite, the inverse  $\chi^2$   $P$  test is applicable; this statistic has a  $\chi^2$  distribution with  $2N$  degrees of freedom, and large values are cause to reject the null hypothesis. For large panels, Choi (2001) therefore proposes the modified inverse  $\chi^2$   $P_m$  test which converges to a standard normal distribution; a large value of  $P_m$  casts doubt on the null hypothesis. Choi's simulation results do not reveal a specific value of  $N$  over which  $P_m$  should be preferred to  $P$ .

**Table 4.6: Fisher-type unit-root test for ROA based on augmented Dickey –Fuller tests**

Ho: All panels contain unit roots	Number of panels = 1
Ha: At least one panel is stationary	Number of periods = 10
AR parameter: Panel-specific	Asymptotics: $T \rightarrow$ Infinity
Panel means: Included	
Time trend: Included	
Drift term: Not included	ADF regressions: 2 lags

	Statistic	p-value
Inverse chi-squared(2) P	72.0873	0.0000
Inverse normal Z	-8.1259	0.0000
Inverse logit t(9) $L^*$	-21.2440	0.0000
Modified inv. chi-squared $P_m$	35.0437	0.0000

P statistic requires number of panels to be finite.  
Other statistics are suitable for finite or infinite number of panels.

.Source: Research data 2018

**Table 4.7: Fisher-type unit-root test for ROA based on Phillips-Perron tests**

xtunitroot fisher ROA, pperron trend lags(2)		
Ho: All panels contain unit roots	Number of panels = 1	
Ha: At least one panel is stationary	Number of periods = 10	
AR parameter: Panel-specific	Asymptotics: $T \rightarrow$ Infinity	
Panel means: Included		
Time trend: Included		
Newey-West lags: 4 lags		

	Statistic	p-value
Inverse chi-squared(2) P	8.3395	0.0155
Inverse normal Z	-2.1582	0.0155
Inverse logit t(9) $L^*$	-2.4484	0.0184
Modified inv. chi-squared $P_m$	3.1697	0.0008

P statistic requires number of panels to be finite.  
Other statistics are suitable for finite or infinite number of panels.

Source: Research data 2018

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Table 4.8: Fisher-type unit-root test for ROA based on augmented Dickey-Fuller tests

. xtunitroot fisher ROA, dfuller trend lags(2)			
Ho: All panels contain unit roots		Number of panels =	1
Ha: At least one panel is stationary		Number of periods =	10
AR parameter: Panel-specific		Asymptotics: T ->	Infinity
Panel means: Included			
Time trend: Included			
Drift term: Not included		ADF regressions: 2 lags	
Statistic			
p-value			
Inverse chi-squared(2) P	6.3241		0.0398
Inverse normal Z	-1.9772		0.0398
Inverse logit t(9) L*	-2.5264		0.0106
Modified inv. chi-squared Pm	2.4221		0.0083
P statistic requires number of panels to be finite.			
Other statistics are suitable for finite or infinite number of panels.			

Source: Research data 2018

Table 4.9: Fisher-type unit-root test for ROA based on Phillips-Perron tests

. xtunitroot fisher ROA, pperron trend lags(2)			
Ho: All panels contain unit roots		Number of panels =	1
Ha: At least one panel is stationary		Number of periods =	10
AR parameter: Panel-specific		Asymptotics: T ->	Infinity
Panel means: Included			
Time trend: Included			
Newey-West lags: 5 lags			
Statistic			
p-value			
Inverse chi-squared(2) P	8.6322		0.0134
Inverse normal Z	-2.2158		0.0134
Inverse logit t(9) L*	-2.5360		0.0160
Modified inv. chi-squared Pm	3.3061		0.0005
P statistic requires number of panels to be finite.			
Other statistics are suitable for finite or infinite number of panels.			

Source: Research data 2018

## 4.9 Test of hypothesis

## 4.9.1 Equity Bank

Table 4.10: Multi linear Regression Coefficients (Equity Bank)

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta	t	
1	(Constant)	0.666	0.764		0.872	0.000
	Deposits (billions)	-0.077	0.067	-0.281	-1.158	0.021
	Asset base (billions)	0.123	0.052	0.675	2.349	0.066

Source: Research data (2018)

The model was therefore ; Performance = 0.666– 0.077X<sub>1</sub> + 0.123X<sub>2</sub>

## 4.9.2 National Bank of Kenya

Table 4.11: Multi linear Regression Coefficients (NBK)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.485	1.855		.261	0.000
1 Deposits (billions)	-.318	.341	-0.113	-.931	0.030
Total Assets (billions)	.271	.286	0.691	.947	0.000

a. Dependent Variable: Performance

The model was therefore

$$\text{Performance} = 0.485 - 0.318X_1 + 0.271X_2$$

*H<sub>01</sub>: There is no significant effect of customer deposits on performance of commercial banks in Kenya.*

Table 4.10 indicates that the regression weight for customer deposits was negative and significant ( $\beta = -0.77$ ,  $t = -1.158 <$  critical value 2.262,  $p < .05$ ). Therefore, the null hypothesis was rejected in favor of the alternate hypothesis at  $p 0.021 < 0.05$  level of significance implying that customer deposits have a statistically significant relationship with performance of Equity bank in Kenya (alternate hypothesis was accepted). The regression estimate for customer deposits was -0.077, this indicates that a unit increase in customer deposits would result in 7.7% decrease in performance of Equity bank Kenya. Table 4.11 indicates that the regression weight for customer deposits was negative and significant ( $\beta = -0.318$ ,  $t = -0.931 <$  critical value 2.262,  $p < 0.05$ ). Therefore, the null hypothesis was rejected in favor of the alternate hypothesis at  $p 0.030 < 0.05$  level of significance implying that customer deposits have a statistically significant relationship with performance of NBK (alternate hypothesis was accepted). The regression estimate for customer deposits was -0.318, implying that a unit increase in cash reserves would result in 31.8% decrease in performance of NBK.

These findings concur with Nafula (2003) that customer deposits have a significant and negative effect on earnings of banks since holding cash is associated with an opportunity cost and the interest expense on these deposits. The findings also agree with those in Dermirguc -Kunt & Huzinga (1998) who argued that banks which depend largely on deposits as their funding activities are less profitable, as deposits require more branching and other expenses. .

The finding differ with Arif & Anees (2012) who found that that increase in deposits boosts a bank's earnings as this places the bank in a better position to generate more interest income by advancing these deposits to customers to earn interest and concluded that liquidity risk may be mitigated by raising the deposit base as this will make the bank more liquid and in a better position to meet its obligations conveniently and avoid overnight borrowing and its associated costs as well as helping banks to avoid fire sale risk. The findings also differ with those in Naceur & Goiaed (2001) who found that the best performing banks are the ones which maintained high level of deposit accounts.

*H<sub>02</sub>: There is no significant effect of asset base on performance of commercial banks in Kenya.*

Table 4.10 indicates that the regression weight for cash reserves was negative and insignificant ( $\beta = 0.123$ ,  $t = 2.349 >$  critical value 2.262,  $p > .05$ ). Therefore, the null hypothesis was not rejected at  $p 0.066 > 0.05$  level of significance implying that asset base do not have a statistically significant relationship with performance of Equity bank in Kenya . The regression estimate for Asset base was 0.123, this indicates that a unit increase in Asset base would result in 12.3% increase in performance of Equity bank. This finding could be supported by the digitization strategy of the Bank, with the roll out of Eazzy Banking App and Equitel, which is currently the second largest mobile money transfer service hence, generating more returns online but not necessarily at the physical banking halls (Cytonn, 2017).

The finding concur with Liu (2013), Hadad (2013), Lukorito *et al* (2014) that found banks with largest asset size have a significantly positive relationship with profitability while banks with smallest asset size have negative relationship with profitability. Because large banks can take advantage of the economies of scale because large banks have more diversified portfolios and earn higher profits. Chege & Bichanga (2017) found that asset base, proxied by bank size has a statistically significant positive effect on bank performance and an increase in asset base leads to an increase in the profitability of a bank.

The findings of this study however differ with the findings by Athanasoglou, Brissimis & Delis (2008), Aladwan (2015), Naifer (2010) who found that the effect of bank size on profitability is insignificant and that size does not provide economies of scale in banking since as the bank size expands, the asset base grows and they may become too complex to manage because of bureaucratic or other reasons resulting to diseconomies of scale. The finding by Ezra (2013) that growth in bank assets have negative effect on bank profitability revealing that large commercial banks perform lower than smaller commercial banks also differ with this study findings. This study finding on the effect of asset base on bank performance contribute to the modern portfolio theory since an increase in asset base boost bank performance and therefore, banks should expand their asset size and diversify their asset portfolios to diversify and minimize the risk and hence maximize profitability.

Table 4.11 indicates that the regression weight for NPLs was positive and significant ( $\beta = 0.271$ ,  $t = 0.947 < \text{critical value } 2.262$ ,  $p < 0.05$ ). Therefore, the null hypothesis was rejected in favor of the alternate hypothesis at  $p = 0.000 < 0.05$  level of significance implying that asset base have a statistically significant relationship with performance of NBK (alternate hypothesis was accepted). The regression estimate for asset base was 0.271, indicating that a unit increase in asset base would result in 27.1% increase in performance of NBK. For both banks, the effect of asset base on performance was positive with equity bank ( $\beta = 0.123$ ) and NBK ( $\beta = 0.271$ ). This shows that the asset base of NBK generate more wealth to shareholders than the assets of Equity bank. The regression coefficient for Equity bank was not significant and thus the null hypothesis was not rejected, unlike for NBK where the coefficient was statistically significant.

## 5. CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Conclusions

This study found a statistically significant negative relationship between customer deposits and performance of commercial banks in Kenya and as customer deposits increase, profitability decreases. This is due to the fact that deposits have claims against them since they are liabilities to the bank and therefore if the bank is not generating enough income in the form of interest income from loans to offset interest expense on deposits, profits will dwindle. The study therefore concluded that an increase in customers' deposits has a negative impact on bank performance.

The regression weight for asset base was positive and not significant and therefore the study concluded that asset base has a positive but not statistically significant relationship with performance of Equity bank but for NBK, asset base had a statistically significant effect on performance. Assets increase the ability of a bank to generate more income by offering a platform for investment and to mobilize resources and also an opportunity to diversify the banks investment portfolio and hence revenue sources through economies of scale.

### 5.2 Recommendations

Commercial banks should be aggressive in identifying viable ways to invest the customers' deposits to generate interest income. The banks should also look for more stable funding sources for stability in their operations. The banks should therefore diversify their sources of funding; diversify their investments of these funds and hence diversifying their income sources. Commercial banks could also focus on core deposits such as demand and savings deposits, which are largely inelastic and can therefore insulate the bank funding costs against economic shocks by maintaining stability of interest expenses and withdrawal patterns.

Banks should pursue strategies for increased growth. This includes increasing the bank's branches so as to absorb the cash from the hands of the public and subsequently enhance the bank business and transaction volumes. The results show the presence economies of scale to warrant increased profitability through increased asset size. Therefore, management of commercial banks should improve the volume and value of assets at its disposal by looking for means to acquire additional assets since assets generate revenues to the commercial banks. Banks should hold a well-diversified portfolio of assets in various sectors to increase the propensity to tap more income through increased return on investment. In terms of managing risk, banks should invest in earning assets that are not all dependent on the same economic variables but are consistent with the return they seek. To minimize exposure to risk, consideration should be given to risk free assets particularly the government securities whose returns are certain to guarantee the bank's income and thus shield them from the possible effect of interest to be paid to the owners of the resources that have been transformed into assets.

### 5.3 Suggestions for further research

Future studies should focus on a longer time span of about 20 to 30 years as this would clarify whether the observed relationship changes over the years. Such a study would call for advanced econometric and statistical analysis such as time series and panel data analysis. Further, other studies can include more liquidity risk management variables and other bank performance measures. Future studies could also include comparisons with foreign owned commercial banks so that to examine the similarity and differences in the study results. Future studies can also include other measures of performance such as return on deposits in addition to the ones used. Further research can be undertaken on the relationship between asset base and bank performance by introducing new variables, longer period and different method of analysis (GEE, GMM, Dynamic panel analysis among others). The study variables could also be studied individually in the case of future studies to gain an in-depth effect of each on bank performance.

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