THE EFFECT OF ASSET LIABILITY MANAGEMENT ON PROFITABILITY OF COMMERCIAL BANKS IN KENYA

BY

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DECLARATION

This research project is my original work and has not been submitted for examination to any other University.

Signature…….. Date……

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D61/64671/2013

This project has been submitted with my authority as the university supervisor.

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DEDICATION

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ABBREVIATIONS AND ACRONYMS

ALM-Asset Liability Management

ANOVA- Analysis of Variance

CBK-Central Bank of Kenya

IRR- Interest Rate Risk

KBA- Kenya Bankers Association

NII- Net Interest Income

NSE- Nairobi Securities Exchange

ROA- Return on Assets

ROE- Return on Equity

ABSTRACT

To effectively compete in the market place, banks manage their assets and liabilities taking into consideration the risk level, earnings, liquidity, profit, solvency, the level of loans and deposits to mitigate losses and thus improve profitability. Asset liability management is comprehensive and dynamic framework used to measure, monitor and manage the market risk of a bank. Considering that the Kenyan banking sector has been competitive and ALM is critical for success of financial institutions, this descriptive study set out to determine the effect of asset liability management on profitability of commercial banks in Kenya. The study collected secondary data from published financial statements of 44 commercial banks in Kenya for the period 2010 to 2014. The regression analysis establish that 47.7 percent of variations in financial performance proxied by ROA are explained by variations in the study independemt variables namely; Size, Capital structure and asset liability management position of the bank. The findings show that there is a statistically significant positive relationship between bank size and financial performance and a statistically significant negative relationship between capital structure and financial performance. A unit increase in ALM position caused by increase in advances and decrease in deposits causes a decline in average financial performance of the banks. The study therefore recommends that bank managers should put in place mechanisms to attract deposits and low cost funding so as to manage any potential liquidity mismatches that may force the banks to resort to expensive debt capital. Given that bigger banks are seen to perform better than smaller banks, policy should be geared towards making the smaller banks equally competitive so that they can contribute in financial inclusion in the country. Future studies should revisit the presumed linear relationships between the study variables and choice should be made on use of fixed or random effects with the panel data.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The business environment is characterized by risks and uncertainties. To effectively compete in the market place, banks manage their assets and liabilities taking into consideration the risk level, earnings, liquidity, profit, solvency, the level of loans and deposits to mitigate losses and thus improve profitability (Zopounidis, 2001). Asset liability management can be achieved through mitigating risks within the accepted levels. Financial institutions are inclined to carry out this process profitably and seek to use optimal allocated capital (Angelopoulos and Mourdoukoutas, 2001).

According to Ozkan-Gunay (1998) Asset Liability Management (ALM) has grown up as a response to the problem of managing modern day business which is exposed to a wide variety of risks in an environment where interest rates, exchange rates and economic conditions are highly volatile. The maturity mismatches and changes in the levels of assets and liabilities cause both liquidity risk and interest-rate risk. The ALM process is the only solution for banks to survive in this rapidly changing environment where the composition and risk profile of their assets and liabilities have a direct impact on their performance and profitability.

Angelopoulos et al. (2001) posit that asset liability management (ALM) ensures that all the relevant asset and liability classes are managed in an integrated fashion. The values of the assets and the liabilities are influenced by, amongst others, management strategy and economic circumstances. ALM models can be used to show the expected development of an organization, usually measured as solvency and profitability, dependent on both internal (strategy) and external (economy) factors. Zopounidis

(2001) maintain that traditional ALM models often only facilitate the use of one or a few possible economic scenarios. These traditional models can be used to obtain a general picture of the expected development of solvency and profitability. However, these models do not take into account the uncertainty that is involved in predicting long-term economic developments. Managing liquidity and the balance sheet are crucial to the existence of a financial institution and sustenance of its operations. It is also essential for seamless growth of the balance sheet in a profitable way.

1.1.1 Asset Liability Management

According to Angelopoulos et al. (2001) the management of assets and liabilities can be defined as the strategic management of the balance sheet for risk optimization of liabilities and assets taking into account all market risks. Asset liability management is comprehensive and dynamic framework used to measure, monitor and manage the market risk of a bank. It is the management of structure of balance sheet in such a manner that the net earnings from interest is maximized within the overall risk-preference of the firm.

The management of assets and liabilities seeks to maximize earnings, adjusted for risk, given the long-term shareholders. Uyemura (2003) argue that asset-liability management is a cost profit function which takes into account the assumed risk, level of earnings and liquidity of the bank. The management of asset and liabilities is important because it acts as a risk management technique designed to earn an adequate return while maintaining a comfortable surplus of assets beyond liabilities. It takes into consideration interest rates, earning power, and degree of willingness to take on debt and hence is also known as surplus management. Oguzsoy and Guven (1997) indicate that the management of risk aims at assisting the banks to achieve a

balance between risks and profitability; this is realized through a proper match of assets and liabilities. The firm is able to meet its short term obligations when due and also invest in profitable ventures.

The function of ALM is not just protection from risk. The safety achieved through ALM also opens up opportunities for enhancing net worth. Interest rate risk (IRR) largely poses a problem to a bank's net interest income and hence profitability. Changes in interest rates can significantly alter a bank's net interest income (NII), depending on the extent of mismatch between the asset and liability interest rate reset times. Changes in interest rates also affect the market value of a bank's equity. Asset liability management will be measured using credit risk which is measured using loan loss reserve divided by portfolio at risk (Moore, 2006).

1.1.2 Profitability

According to Penman (2007), profitability can be defined as the ability of the firm to make profit from its business activities. Profitability measures the efficiency in the utilization of organizational resources in adding value to the business. Profitability is deemed as a relative term measurable in terms of profit and its relation to other elements that directly influence profitability. According to Srivastava and Srivastava (2006), profitability is the ability of a given investment to earn a return from its use.

Pandy (2005) argues that profit maximization is the fundamental objective of all firms. In a competitive marketplace, a business owner must learn to achieve a satisfactory level of profitability. Increasing profitability involves determining which areas of a financial strategy are working and which ones need improvement. Profitability is a measure of economic gains realized by a firm in relation to the capital invested. This

level of economic success can be determined by the amount of reported profits in a financial year. Profitability measures include: ROA (Return on Assets) computed as Net Income divided by Total Assets and ROE (Return on Equity) computed as to Net Income divided by Equity, which is the ultimate measure of economic success.

1.1.3 The Relationship between Asset Liability Management and Profitability

Asset liability management enables the firm to balance between its liabilities and assets. This in turn minimizes financial risks and hence improves profitability. Asset liability management of the firm guides the management of the firm in making investment decision. This is because the firm is able to allocate sufficient funds for investment as a result of adoption of liquidity management best practices (Uyemura and Van Deventer, 2003).

Uyemura (2003) argues that firms that maintain a proper structure of their balance sheet records high profitability compared to those firms who fail to maintain proper balances of assets and liabilities. This is achieved by effective risk management which play an integral role in addressing financial risk since all risk cannot be eliminated but it is the responsibility of risk managers to identify their risk levels and know which level can be controlled or accepted. Anjichi (2014) notes that sound asset liability management practices create a profitable and conducive environment that enables financial institutions to define strategic asset allocation and to identify financial opportunities and uncertainty in order to improve their financial resources. Asset liability management is relevant to, and critical for, the sound management of the finances of any firm that invests to meet its future cash flow needs and capital requirements.

Bhunia (2010) indicates that asset and liability management ensures that the firm is liquid to meet short term obligations of the firm for instance; payments for expenses like salaries, materials and taxes. Future cash flows are uncertain, holding cash gives a safety margin for eventual downturns. It is an important task for the financial manager to achieve appropriate balance between liquidity and profitability when making key investment decisions.

1.1.4 Commercial Banks in Kenya

The banking industry in Kenya is regulated by the Central Bank of Kenya Act, Banking Act, and the Companies Act among other guidelines issued by the Central Bank of Kenya (CBK). Commercial banks in Kenya are licensed, supervised and regulated by the Central Bank of Kenya (CBK) as mandated under the Banking Act (Cap 488). Banking industry in Kenya was liberalized back in 1995 and exchange controls revoked (CBK, 2015). Currently there are there are 43 licensed commercial banks and 1 mortgage finance company. The banks have come together under the Kenya bankers Association (KBA), which works as lobby for the local banking industry. Kenya bankers Association (KBA) also serves as a forum to address issues affecting the banking sector (CBK, 2015).

Mwende (2014) indicates that the commercial banks in Kenya has over the past few years enjoyed exponential growth in deposits, assets, profitability and products offering, mainly attributed to automation of services and branch network expansion both locally and regionally. This growth has brought about increasing competition among players and new entrants into the banking sector. Asset-liability management plays a crucial role in enabling the bank to mitigate their financial losses. Currently, banks are now focusing on the diverse customer rather than traditional banking products such as over the counter deposits and withdrawal.

Commercial banks aims to have a proper match in the terms of the rate sensitive assets with their funding sources in order to reduce interest rate risk while maximizing profitability. Due to changes in the market commercial banks are forced to adjust the interest rate on deposits upward to remain competitive, but their earning assets are concentrated in long- term, fixed-rate loans, and investments. Financial performance might be impaired because the institution cannot adjust its income earned on loans upward as fast as the cost of funds is increasing. Interest rate risk to some degree is unavoidable, but it is manageable (Zenios and Ziemba, 2007).

1.2 Research Problem

To cope with the changes in the environment, banks have been forced to effectively manage their asset and liability to mitigate various risks that arise due to mismatch between their assets and liabilities that is loans and advances of the bank (Angelopoulos et al., 2001). According to Oguzsoy and Guven (1997) asset liability management (ALM) is an essential tool for monitoring, measuring and managing the market risk of a bank.

Due to changes in the environment the Kenya market has become competitive, competition usually reduces the margin between the interest rate charged on loans and the rate paid on deposits. In a competitive environment, commercial banks may not be able to increase rates earned on loans or lower the rate paid on deposits without affecting client demand and the profitability of the institution. Managers should strive to reduce or manage the effect interest rate risk will have on the commercial banks profitability. Proper management of assets and liabilities ensures a smooth and efficient functioning of the banking sector in a manner that it accommodates changes in the external environment. Mwende (2014) indicates that developing appropriate bank management strategies assists banks in mitigating financial risks and engaging in profitable ventures.

Chakraborty (2008) did a study to establish the relationship between asset liability and profitability of Indian pharmaceutical companies. The findings depicted a significant positive relationship between the asset liability and profitability of the pharmaceutical firms. Deloof (2003) studied the effect of asset liability management and profitability of Belgian services firms. The results revealed that there was a positive correlation between asset liability management and profitability. Belete (2013) investigated the relationship between asset liability management and commercial banks profitability in Ethiopia. The results confirmed that assets of the commercial banks exhibited a positive relationship with profitability. Similarly, it was further revealed that liabilities had a significant negative relationship with the bank's profitability.

Gikonya (2011) investigated the effect of asset liability management on profitability of commercial banks in Kenya. The study found out that there is a positive relationship between profitability and asset liquidity management of commercial banks in Kenya. The study limited itself to: return on assets (ROA) and current ratios. Therefore, the current study seeks to extend the model by incorporating the following variables: financial leverage and management efficiency to assess commercial bank's debt to equity ratio and how management efficiency impacts on operating profit to income ratio.

From the above studies, little focus has been laid on the effect of asset liability management and profitability of commercial banks in Kenya. Gikonya (2011) recommended that banks entrench effective asset liability management policies so as to maximize their profits. This study therefore sought to expand on the effective asset liability management policies with the intent to answer the following research question: What is the effect of asset liability management on profitability of commercial banks in Kenya?

1.3 Research Objective

This study sought to determine the effect of asset liability management and profitability of commercial banks in Kenya.

1.4 Value of the Study

The study provides more understanding of the best practices in managing different risks in the banking industry and economic environment. It will also provide insights to other firms in the finance sector on how to mitigate risks through ensuring a proper balance between assets and liabilities.

Central bank is a key partner in policy setting. It might use the findings for this study to set policies that ensure commercial banks manage their assets and liabilities to mitigate financial risks. This enables commercial banks to meet their short-term financial obligations and maintain a good balance that guarantees improved profitability and long-term viability.

This research work contributes to the literature on significance of maintaining a proper balance between assets and liability and risk reduction. This research therefore forms the basis for further research into the application of innovative asset and liability management strategies by similar industry players since it has a direct bearing with institutional profitability.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter covers the theoretical framework, the determinants of profitability, empirical studies and the summary of the literature review.

2.2. Theoretical Framework

This section reviews the theories that support the relationship between asset-liability management and the profitability of firms. These theories are namely: liquidity preference theory, tradeoff theory and portfolio theory.

2.2.1 Liquidity Preference Theory

This concept was first expressed by Keynes (1989), this theory is also known as liquidity preference hypothesis. Liquidity preference theory intimates the idea that investors demand a premium for securities with longer maturities, which entail greater risk, because they would prefer to hold cash, which entails less risk. The more liquid an investment, the easier it is to sell quickly for its full value. The amount of money demanded for this purpose increases as income increases. When the interest rate decreases people demand more money to hold until the interest rate increases, which would drive down the price of an existing bond to keep its yield in line with the interest rate. Thus, the lower the interest rate, the more money demanded and vice versa.

Jappelli and Pagano (2002) indicate that a financial institution that lends out credit to borrowers may face liquidity problem especially if the borrowers are not able to pay the loans on time. This may prevent the firms from investing in profitable projects that promises higher returns in future. According to this theory, a firm needs to hold

more cash for investment, it is therefore important for the firm to mitigate the level of credit risk by ensuring that borrowers are credit worthy before giving out credit (Rogers, 1997).

The relevance of this theory is that firms should maintain an optimal level of liquidity. This is because the firm is able to grasp opportunities that promise higher returns. Pasinetti (1997) emphasizes that the firm should work towards achieving a balance through proper management of the firm's finances to meet future cash flow needs and capital requirements. It is therefore important for the firm to put efforts in monitoring and coordinating its assets and liabilities. This will enable the firm to gain stability and thus easily absorb risks and shocks. Asset liability management is a key ingredient towards achieving efficiency and growth of banks.

2.2.2 Trade off Theory

Brusov and Filatova (1991) posit that trade-off theory of capital structure refers to the idea that a firm chooses the amount of debt finance and how much equity finance to use by balancing the costs and benefits. Canner et al. (1997) emphasizes that corporations are usually financed partly with debt and partly with equity. The firm has to make a proper match between its assets and liabilities in order to protect itself from financial risks and take advantage of profitable investment opportunities.

According to Brusov (2013), trade-off theory of capital structure basically deals with the two concepts namely; the cost of financial distress and agency costs. The relevance of the trade- off theory of capital structure is to explain the fact the firms are usually financed partly with debt and partly with equity. This means that the firm should make appropriate decisions regarding when to use debt and equity to finance its investment. In so doing, an appropriate match between assets and liabilities should

be maintained to mitigate financial losses and from various risks and loss of investment opportunities.

There are certain benefits that accrue once a firm is financed using debt; the tax benefits of debt. There is a cost of financing with debt, financial distress costs including bankruptcy costs of debt and non-bankruptcy costs for instance staff turnover, suppliers demanding disadvantageous payment terms (Modigliani and Miller, 1958). Brau and Woller (2004) argue that a firm experiences financial distress when the firm is unable to cope with the debt holders' obligations. If the firm continues to fail in making payments to the debt holders, the firm can even be insolvent. With a proper balance of assets and liabilities, the firm is less likely to face challenges of financial distress. The assumption of this theory is that as the marginal benefit of the firm increases the debt declines. Similarly, while the marginal cost increases the firm optimizes its overall value and thus focuses on the tradeoff when choosing how much debt and equity to use for financing.

2.2.3 Portfolio Theory

Markowitz (1952) posits that portfolio theory plays a pivotal role in making investment decisions. This theory emphasizes on the need to have a portfolio balance model of asset diversification to mitigate the financial risks that may expose the firm to financial losses. This might negatively affect the liquidity position of a financial institution. However, a well-defined portfolio prevents the firm from sustaining total loss since the risks are minimized by the portfolio of assets invested by the firm.

Black, Jensen and Scholes (1972) argue that this implies that the portfolio diversification and the desired portfolio composition of commercial banks are results of decisions taken by the bank management. The ability to attain maximum profits

depends on the feasible set of assets and liabilities determined by the management and the unit costs incurred by the bank for producing each component of assets (Nzongang and Atemnkeng, 2006). This means that the firm can limit the volatility of the firms' portfolio to improve its performance by spreading the risks among different types of securities that do not always behave the same way.

According to Canner et al. (1997), the relevance of this theory is that the firm should maintain a proper balance of assets and liabilities to meet its short-term and long-term financial obligation. To maintain this balance, the firm should diversify its portfolios to minimize risks that may bring about financial losses and impact negatively on the liquidity position of a financial institution. This is important because each asset class performs differently over time due to its unique balance of risk and reward. Previously, stocks have a higher rate of return, but also a higher risk. Bonds and cash are both usually lower-risk investments, thus produce more modest returns.

Modigliani and Miller (1958) put forth that periodic rebalancing has significantly lower the risk of a portfolio. A firm that intends to mitigate its risks should work towards establishing a portfolio to cope with the various risks. It is imperative to note that investments in a portfolio may alter their values due to changes in the external environment. This might negatively affect the balance of asset portfolio allocation mix. To maintain a proper balance of your portfolio that can cope with the changes in the market, the firm should practice rebalancing. This means that the firm should consider selling the proportions of its investments that have accumulated high values. Those funds can then be sued to purchase underperforming portfolio of assets and retain the original asset allocation mix.

2.3 Determinants of Profitability of Commercial Banks

Determinants of profitability are essential components in assisting the firm towards achieving profits. Below are some of the determinants of profitability that have been discussed in this study: liquidity, size of the firm, use of leverage and the risk profile of the firm.

2.3.1 Liquidity

Liquidity is characterized by a high level of trading activity. It measures how much cash a company has and how easily it is able to pay its debt. Assets in any firm are categorized into various classes. A firm that holds high amount of cash is likely to take advantage of profitable investments unlike a firm that is illiquid. Credit risk may expose a firm. Liquid assets constitute a significant portion of a firm's total asset (Bourke, 2002).

Financial managers pay due attention to the measurement and management of corporate liquidity failure to which may lead to severe shortage of liquidity leading to inability to meet its short and medium term obligations as and when they become due hence financial distress (Uyemura, 1993). Liquidity risk can be measured by two main methods: liquidity gap and liquidity ratios. The liquidity gap is the difference between assets and liabilities at both present and future dates. Liquidity is the amount of capital that is available for investment and spending. Capital includes cash, credit and equity (Bourke, 2001).

2.3.2 Size of the Firm

The other determinant of profitability is the size of the firm. Large firms are more likely to manage their working capitals more efficiently than small firms. According to Zenios and Ziemba (2007), most large firms enjoy economies of scale and thus are

able to minimize their costs and improve on their financial performance. Size of a firm is measured by the sales volume of a firm.

The proxy used for calculating the size of the firm is the log of net sales including Sharpe (1990) in their research studies have found out a negative relation between size of firm and its leverage as there is more transparency about large firms which reduces the undervaluation of new equity issue and encourages the firms to finance through their equity. If the size of the firm increases profitability also increases therefore large sized firms tend to be more profitable. This means that a positive relationship is expected between the size of the firm and profitability (Sharpe and Tint, 1990).

2.3.3 Use of Leverage

Leverage of the firm is a key determinant of profitability of the firm. The firms leverage decisions centers on the allocation between debt and equity on financing a firm. Rosen and Zenios (2006) notes that leverage affects the level and variability of the firm's after tax earnings and hence, the firm's overall risk and return.

The study of leverage is significant due to the following reasons: Operating risk refers to the risk of the firm not being able to cover its fixed operating costs. Since operating leverage depends on fixed operating costs, larger fixed operating costs indicates higher degree of operating leverage and thus, higher operating risk of the firm. High operating leverage is good when sales are rising but risk when the sales are falling (Memmel and Schertler, 2011).

2.3.4 The Risk Profile of the Firm

The risk profile of the firm is a key determinant of profitability. Due to the turbulent nature of the external environment firms are exposed to different risks that may negatively affect their profitability. These risks may expose the firm to additional costs or disruption of operations. DeYoung and Yom (2008) argue that financial risk management allows firms to seize opportunities by allowing managers to better identify and more effectively assess capital needs and improve capital allocation.

Kusy and Ziemba (2001) indicate that firm managers are likely to have many opportunities to create value for shareholders however; they must ensure a proper match between assets and liabilities in order to mitigate risks and create room for investment opportunities. Firm managers should secure business continuity and support the achievement of the company's goals by preventing dangerous situations in an efficient way.

2.3.5 Management Competence Index

Management defines competence is the characteristics or traits of a person which he or she uses to improve performance. The management of the firm is expected to be competent to achieve efficient and effective delivery of quality services that improves customer satisfaction. This in turn leads to improved profitability of the firm (Pandy, 2005).

Penman (2007) posits that the capability of the management to deploy its resources efficiently, income maximization, reducing operating costs can be measured by financial ratios. One of these ratios used to measure management quality is operating profit to income ratio. The higher the operating profits to total income the more the efficient management is in terms of operational efficiency and income generation.

Pasinetti (1997) explains that the other important ratio is expense to asset ratio. The ratio of operating expenses to total asset is expected to be negatively associated with profitability. Management quality in this regard, determines the level of operating expenses and in turn affects profitability.

2.4 Empirical Review

Moore (2006) investigated the impact of asset and liability management on financial performance of commercial banks in United Kingdom. The sample size consisted of 45 commercial banks. An explorative survey was used to test the relationship between the variables, the results of the study found a positive correlation between asset liability management and financial performance of commercial banks.

Singh (2008) conducted a study on the relationship between working capital management and profitability of small manufacturing firms in Europe. A survey of 100 manufacturing firms was conducted and secondary data sources from financial statements of these firms were used. The researcher did a cross-sectional study for these firms and the data was analyzed using descriptive statistics. It was concluded that there was a positive relationship between working capital components and profitability of manufacturing firms in Kenya.

Stierwald (2010) studied the impact of asset and liability management on Profitability of large Australian firms. The study used a descriptive survey and secondary data source for five years was obtained from financial statements and records of large Australian firms. The study used secondary data sources. Correlation and regression analysis were used for analysis to show the relationship between the variables. The results of the study found that there was a positive relationship between asset and liability management and profitability.

Gikonya (2011) studied the relationship between asset liability management and profitability of commercial banks in Kenya. A cross-sectional survey was used in a population of 43 licensed commercial banks in Kenya. Secondary data was obtained from financial statements and records of commercial banks. Analysis of data was done using a linear regression mode. The study found asset liability management was positively related to profitability. The limitation of this study is that it did not investigate the effect of financial leverage on profitability of commercial banks and the effect of financial risk and profitability of the firm.

Maina (2011) examined the relationship between liquidity management and profitability of the Oil companies in Kenya. The study covered the period 2007- 2010. A regression model was developed to determine the relationship between the dependent variable (Profitability of the firms) and independent variables (liquidity position). The independent variable used in the model consisted of Current ration, quick ratio, cash conversion cycle, while leverage and the age of the firm were used as control variables. The results of the study showed a weak relationship between liquidity and profitability. The study concluded that liquidity management is not a significant contributor alone of the firm's profitability and there exist other variables that will influence ROA.

Wambu (2013) sought to establish the relationship between the profitability and the liquidity of commercial banks in Kenya. The population of the study was comprised of all 44 commercial banks in Kenya operating in the years 2008 to 2012. For a bank to qualify it needed to have been in operation during the whole period of the study and therefore institutions that merged or were not in operation in the whole period of study were eliminated The study used secondary data obtained from audited financial

statements of the banks for five years and a regression model was used for data analysis. The study used secondary data collection of the return on assets, to measure profitability and CBK liquidity ratio and current ratio to measure liquidity in each year. The study found out that there was an inverses relationship between profitability and liquidity of commercial banks in Kenya.

Gregory (2013) investigated the relationship between asset liability management and financial performance of sampled service firms in America. The study used a longitudinal study research design. Secondary data for ten years was obtained from financial statements and records. Analysis of data was done using a regression model. The study concluded that there was a positive relationship between asset liability management and financial performance of service firms in United States.

Darush (2013) did a study on the impact of asset liability management and financial performance of Swedish firms. The study used a cross-sectional survey design whereby secondary sources of data were obtained from the financial statements of Swedish micro firms. The study used descriptive statistics for analysis; the results established that there was a positive correlation between asset liability management and financial performance of Swedish micro firms.

Karani (2014) carried out a study to investigate the effect of liquidity management on profitability of commercial banks in Kenya. The population of the study comprised of all the 43 commercial banks in Kenya operating in the years 2009 to 2013. Secondary data was obtained from audited financial statements and records. The study used regression analysis to establish the relationship between liquidity management and profitability. The study found out that liquidity management was positively related to profitability of commercial banks in Kenya.

Anjichi (2014) did a study to establish the relationship between asset and liability management and financial performance of commercial banks in Kenya. The study used a descriptive survey to find out the relationship between the variables. The population of the study involved 43 licensed commercial banks in Kenya. Secondary data was obtained from central bank for a period between 2005-2010. Data was analyzed using a regression model and the results of the analysis indicated that there was a positive a relationship between the asset and liability management and financial performance of commercial banks in Kenya.

2.5 Summary of the Literature Review

The results of the empirical findings confirms to the hypothesis of the study which predicts the existence of a positive relationship between asset liability management and profitability of commercial banks in Kenya. Literature has confirmed that poor management of assets and liabilities exposes the firm into financial risks that might impact negatively on the profitability of the firm. The firm should therefore work towards achieving a proper match between assets and liabilities. This is also consistent with the theories of the study which shows that firms that maintain a proper fit between their assets and liabilities achieve profitability as compared to those firms that do not effectively balance their assets and liabilities.

The above studies have shown that there exists a positive relationship between asset liability management and profitability of the firm. Examples include: Gikonya (2011), Karani (2014) and Anjichi (2014) among others. However, the limitations of this study are that they have limited themselves to the main variables of the study that is return on assets and current ratio. This therefore necessitates the need to investigate

other factors that have a bearing on asset liability management and impacts on the profitability of commercial banks in Kenya. The current study considers two more variables other than the two main variables discussed previously by Gikonya (2011), Karani (2014) and Anjichi (2014). These variables are: financial leverage and management efficiency as captured under the determinants of profitability in this study. This study therefore seeks to find an answer to the research question; what is the effect of asset liability management on profitability of commercial banks in Kenya?

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section gives an outline of the research methodology that will be used for the study. It comprises the research design, the study population, data collection and data analysis.

3.2 Research Design

The study will use a descriptive survey. Kothari (2004) posit that a descriptive survey is used in explaining the relationship between variables in a study. It will be applied in laying more emphasis in determining the extent of association between the variables and the relationships exhibited between them. A descriptive survey will be used in establishing the relationship between asset liability management and profitability of commercial banks in Kenya.

3.3 Study Population

Cooper and Schindler (2008) posit that a target population is a complete set of cases, objectives or individuals with similar characteristics. According to CBK (2015) there are 43 commercial banks in Kenya that are licensed to work and operate within the boundaries of Kenya (See Appendix I). The research will study all the 43 licensed commercial banks in Kenya. This is because of their composition and risk profile of their assets and liabilities that have a direct impact on their performance and profitability.

3.4 Data Collection

The study will use secondary sources of data since the nature of data to be collected in quantitative. Secondary data will obtained from the regulator; central bank of Kenya.

The data will be extracted from audited financial statements of commercial banks for the period of five years (2010-2014). Data selection will be done based on the measurements of the specific variables under investigation. Profitability will be measured using ROA. The measurements will be obtained profit and loss statements and balance sheet statements. Current ratio will be measured using current assets divided by current liabilities. These measurements will be obtained from the balance sheet statements. Size of the firm will be measured using natural logarithm of total assets. These measurements will be obtained from the balance sheet statements. Management efficiency will be measured using operating profit to income ratio. These measurements will be obtained from profit and loss statements while financial leverage measurements will be obtained from balance sheet statements.

3.5 Data Analysis

Data will be analyzed using descriptive statistics, correlation analysis and regression model. This will include: mean and standard deviation which will be used in showing the relationship between the variables. Inferential statistics will be used in establishing the relationship between Asset liability management and profitability of commercial banks in Kenya.

The summary of the output will be used to determine correlation and coefficient of determination while the tests of coefficient will be used to determine the p-values. Analysis of variance (ANOVA) will be used to test hypothesis of this study which predicts a positive relationship between asset liability management and profitability of commercial banks in Kenya.

3.5.1 Regression Model

The study will adopt a regression model to establish the relationship between asset liability management and profitability of commercial banks in Kenya. The study will extend the model as advanced by Gikonya (2011) investigated on the relationship between asset liability management and profitability of commercial banks in Kenya. The limitation of this study is that it did not investigate on the effect of financial leverage and portfolio at risk and how it impacts on the profitability of commercial banks in Kenya. The study limited itself to: return on assets (ROA) and current ratios. Therefore, the current study seeks to extend the model by incorporating the following variables: financial leverage and management efficiency to assess commercial bank's debt to equity ratio and how management efficiency impacts on operating profit to income ratio.

The regression model to be adopted in this study is as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

b_1 to b_n =the regression coefficients

Y = profitability will be measured using financial performance that will be measured using return on assets (ROA) which is net income divided by total assets.

X_1= Asset liability management will be measured using loan to deposit ratio by computing the average net loans/average deposits (5 years period).

X_2 = the size of the firm will be measured using natural logarithm of total assets.

X_3 = Debt to equity ratio, will be measured using total liabilities/Total assets

β_0 = gradient or slope of the regression measuring the unit of change in y associated with a unit change in X

€ = Error term within a confidence interval of 5%

3.6 Tests of Significance

Model for coefficients will be used to test the hypothesis of this study. The level of significance will be determined using p-values. If the p-value(s) is more than 5% then the null hypothesis is true since this will mean that there is no statistically significant relationship between asset liability management and profitability of commercial banks in Kenya.

Similarly, if the p-value is less than 5% then the alternative hypothesis will be considered true since this will mean that there is a positive relationship between variables. The coefficient of determination will be used to determine if the model is a satisfactory predictor or not using the R^2. R is the correlation coefficient which varies from -1 to +1. (-1) means a perfect negative correlation and (+1) means perfect positive correlation. All the tests will be performed at 95% degree of confidence.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the information processed from the data collected during the study on the effects of asset liability management on financial performance of commercial banks in Kenya. It presents the descriptive statistics, correlation analysis and regression analysis from the study findings.

4.2 Descriptive Statistics

The study targeted 43 commercial banks with an expectation of attaining annual data on the study variables translating to 215 observations. Because of instances of imbalanced data, a balanced panel data of 136 observations was attained as shown in table 4.1 below providing 63.3 percent of the expected data points.

Table 4.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
ROA	136	-.0480	.1040	.0359	.02186	-.547	.208
ALM	136	.0121	1.2429	.7564	.19015	-.206	.208
Debt Equity Ratio	136	1.0000	17.9543	5.4698	2.0853	1.711	.208
Size	136	8.4185	12.6252	10.3710	1.2239	.061	.208
Valid N (listwise)	136						

As presented in table 4.1 above, the mean ROA for the commercial banks in the five year period is 3.5 percent with a standard deviation of 0.021. The ROA data is negatively skewed. Asset Liability management proportion represented by average

loans to average deposits is 75.64 percent which shows that not all deposits are advanced by the banks to manage their cash flow gaps and their liquidity positions. The ALM data set has a standard deviation of 0.190 and is negatively skewed.

The Mean debt equity ratio is at 5.469 with a standard deviation of 2.0853. The data is positively skewed. The average size proxied by log of total assets is 10.3710 with a standard deviation of 1.2239. The data is positively skewed.

4.3 Diagnostic Statistics

Durbin watson test is conducted to check on collinearity of variables. The value of Durbin Watson statistic ranges from 0 to 4. As Presented in table 4.2 below, the value of Durbin-Watson is 1.303 which is approximately close to 2. This is interpreted to indicate no serial correlation. As a rule of thumb, residuals are considered uncorrelated when the Durbin watson statistic is approximately 2.

Table 4.2: Model Summary[b]

Model	Durbin-Watson
1	1.303[a]

a. Predictors: (Constant), Size, Debt Equity Ratio, ALM

b. Dependent Variable: ROA

Variance inflation factor (VIF) and Tolerance levels are applied to test for multicolinearity. The variance inflation factor (VIF) which is a reciprocal of tolerance shows how much the variance of the coefficient estimate is being inflated by multicollinearity. As a rule of thumb, Myers (1990) explain that a VIF for all the independent and dependent variables less than 3 (VIF $\leq$ 3) indicates no multicollinearity while a VIF of ≥ 3 indicates collinearity and more than 10 indicates a problem with multicollinearity. The Tolerance Statistics values below 0.1 indicate a

serious problem while those below 0.2 indicate a potential problem. As indicated in table 4.3 below, all the variables tolerance levels are greater than 0.2 and all the VIF factors are less than 3 implying that the regression data are not prone to multicollinearity problems.

Table 4.3: Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	ALM	.968	1.033
	Debt Equity Ratio	.974	1.027
	Size	.978	1.022

a. Dependent Variable: ROA

4.4 Correlation Analysis

The Correlation matrix presented in table 4.4 below shows a statistically significant weak positive association between ROA and bank size (r=0.451) and a statistically significant weak negative assocation between capital structure and ROA (r=-0.484). The association between ROA and bank size confirm the notion that larger financial institutions tend to be more profitable than smaller financial institutions possibly because of efficiencies from their scale of operations. The statistically significant weak negative association between capital structure and ROA is an indication of negative effects of gearing on overall firm performance.

Table 4.4: Correlations

	ROA	ALM	Debt Equity Ratio	Size
ROA	1			
ALM	.010	1		
Debt Equity Ratio	-.484**	-.131	1	
Size	.451**	.113	.079	1

**. Correlation is significant at the 0.01 level (2-tailed).

The study finds weak positive associations between ALM and ROA (r=0.010), ALM and size (r=0.113) and Size and Capital structure (r=0.079). These relationships are however not statistically significant. There is also a weak negative association between capital structure and ALM position (r=-0.131) which is not statistically significant.

4.5 Effects of Asset Liability Management on Financial Performance

A regression model was fitted to estimate the effects of ALM on financial performance of commercial banks in Kenya. As indicated in table 4.5 below, 47.7 percent of variations in financial performance proxied by ROA are explained by variations in the study independemt variables namely; Size, Capital structure and asset liability management position of the bank (Adjusted R Squared = 0.477).

Table 4.5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.699[a]	.488	.477	.0158165

a. Predictors: (Constant), Size, Debt Equity Ratio, ALM

Table 4.6 below shows that the fitted regression model is significant with F statistic of 41.983 and P< 0.05 which indicates that the points lie moderately close to the line of best fit in the scatter diagram. This indicates that the model is relatively suitable in explaining the variance of financial performance of the commercial banks as explained by the variance in ALM, Capital Structure and Bank Size.

Table 4.6: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.032	3	.011	41.983	.000[b]
	Residual	.033	132	.000		
	Total	.065	135			

a. Dependent Variable: ROA

b. Predictors: (Constant), Size, Debt Equity Ratio, ALM

Table 4.7 below shows the coefficients of the fitted regression equation that translates to:

ROA = -0.017 -0.117 (ALM) – 0.539 (Debt equity) + 0.507 (Size)

Table 4.7: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.017	.013		-1.321	.189
	ALM	-.013	.007	-.117	-1.854	.066
	Debt Equity Ratio	-.006	.001	-.539	-8.542	.000
	Size	.009	.001	.507	8.055	.000

a. Dependent Variable: ROA

The study finds that ALM position negatively affects bank performance (ROA) (β=-0.117, t = -1.854, p>0.05). A unit increase in the ALM proportion necessitated by either an increase in advances or a decrease in deposits results into a decline in the ROA by up to 0.117. This may be explained by the possibility that the increase distabilizes the bank liquidity position and compells the bank to source for more expensive financing to fund the liquidity gaps. The cost of such funding therefore affects the overall profitability of the bank.

The study also observes a negative relationship between capital structure and financial performance of the commercial banks (β=-0.539, t = -8. 542, $p<0.05$). This indicates that a unit increase in debt equity ratio caused by an increase in leverage by the banks or a decrease in bank equity influences a decline in the ROA to the extent of 0.539. This finding suggests that excessive leverage affects banks financial performance through the costs of borrowings.

There is also a positive relationship between bank size and financial performance. From the regerssion output in table 4.7 above, a unit increase in bank size translates into increased financial performance by up to 0.507. The relationship between size and performance is statistically significant (β=0.507, t=8.055, $p<0.05$). This finding therefore implies that comparatively, larger financial institutions post better financial performance than the smaller financial institutions.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the study. It discusses the key findings and interprets the results there from. The chapter also presents the conclusions drawn from the research findings and provides recommendations for improvement as well as suggestions for further research.

5.2 Summary of Findings

The mean ROA for the commercial banks in the five year period is 3.5 percent which confirms the sound performance of the financial services sector when compared with other sectors of the economy. The average loans to average deposits proportion is at 75.64 percent which shows that not all deposits are advanced by the commercial banks. To manage their cash flow gaps and their liquidity positions, commercial banks retain some reserves from deposits.

The statistically significant weak positive association between ROA and bank size confirms the arguments that bigger banks tend to be more profitable than smaller banks because of efficiencies from their scale of operations.

The regression model has an adjusted R squared of 0.477 which implies that 47.7 percent of variations in financial performance of the commercial banks proxied by ROA are explained by variations in the study independemt variables namely; Size, Capital structure and asset liability management position of the bank.

The study findings suggest that an increase in ALM position negatively affects bank performance such that a unit increase in the ALM proportion necessitated by either an increase in advances or a decrease in deposits results into a decline in the ROA by up to 0.117. This specific finding shows that an increase in ALM proportions distabilizes the bank liquidity position and compells the bank to source for more expensive financing to fund the liquidity gaps. The cost of such funding therefore affects the overall profitability of the bank.

The statistically significant negative relationship between capital structure and financial performance of the commercial banks infers that a unit increase in debt equity ratio caused by an increase in leverage by the banks or a decrease in bank equity influences a decline in the ROA to the extent of 0.539. This finding suggests that gearing negatively influences banks financial performance through the increased costs of borrowings.

The statistically significant positive relationship between bank size and financial performance shows that a unit increase in bank size translates into increased financial performance by up to 0.507. This finding confirms the proposition that comparatively, larger financial institutions post better financial performance than the smaller financial institutions.

The study findings are a departure from earlier propositions Moore (2006), Stierwald (2010), Gregory (2013), Darush (2013), Gikonya (2011), Karani (2014) and Anjichi (2014). In the United Kingdom, Moore (2006) found a positive correlation between asset liability management and financial performance of commercial banks. In Australia, Stierwald (2010) found a positive relationship between asset and liability

management and profitability. In The United States, Gregory (2013) notes a positive relationship between asset liability management and financial performance of service firms and in Sweden, Darush (2013) established that there was a positive correlation between asset liability management and financial performance.

In Kenya, Gikonya (2011) found asset liability management was positively related to profitability of commercial banks. Anjichi (2014) indicated that there was a positive a relationship between the asset and liability management and financial performance of commercial banks and Karani (2014) observed that liquidity management was positively related to profitability of commercial banks.

5.3 Recommendations

Given that a unit increase in asset liability position of the commercial banks necessitated by increase in advances and decrease in deposits may lead to a decline in bank performance, bank management should put in place mechanisms that ensure there is no liquidity mismatch caused by increased lending and reduced deposits that compels the bank to borrow at costlier rates and reduce their overall profitability.

In view of the research findings, a significant positive relationship is evident between bank size and levels of commercial banks financial performance. Policy makers should endeavor to put in place policies that support smaller commercial banks to be competitive and eventually stable and successful so as to promote further financial deepening in Kenya.

The significant negative relationship between capital structure and financial performance is a pointer to the negative effects of gearing on banks performance. Bank management should continually monitor their long term debt position so as not to expose the bank to overall financial instability.

5.4 Limitations of the Study

Secondary data was collected from the specific banks' financial reports as per the central bank of Kenya requirements. The study was therefore limited to the degree of precision of the data obtained from the secondary source. While the data was verifiable, it may however be prone to these shortcomings associated with preparation or collection as well as accounting standards.

The study was based on a five year study period from the year 2010 to 2014. A longer duration of the study will have captured periods of different economic performance that may clearly show the trend of the relationships.

The study presumed a linear relationship between the variables. There is chance that the variables may relate in other forms other than the presumed linear relationships. There is chance to pursue curvilinear models as well.

5.5 Suggestion for Further Research

This study has examined the effect of ALM on performance of commercial banks in Kenya. A similar study for a longer period should be carried out in other forms of financial institutions and in other countries to ascertain if the same findings will be obtained. Other types of relationships other than linear relationships could be modeled.

Future research on this area should review the applicability of linear regression models. The data sets should be tested for application of fixed effects and random effect models given that the studies are based on panel data.

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APPENDICES

APPENDIX I: COMMERCIAL BANKS IN KENYA

a). Foreign owned institutions

i). Foreign owned not locally incorporated

- Bank of India
- Citibank N.A. Kenya
- Habib Bank A.G. Zurich
- Habib Bank Ltd.

ii). Foreign owned but locally incorporated institutions (Partly owned by locals)

- Bank of Baroda (K) Ltd.
- Barclays Bank of Kenya Ltd.
- Diamond Trust Bank Kenya Ltd.
- K-Rep Bank Ltd.
- Standard Chartered Bank (K) Ltd.
- Ecobank Ltd
- Gulf Africa Bank (K) Ltd
- First Community Bank

iii). Foreign owned but locally incorporated institutions

- Bank of Africa (K) Ltd.
- UBA Kenya Bank Limited

b). Insitutions with Government participation

- Consolidated Bank of Kenya Ltd.
- Development Bank of Kenya Ltd.
- Housing Finance Ltd.
- Kenya Commercial Bank Ltd.
- National Bank of Kenya Ltd.
- CFC Stanbic Bank Ltd.

c). Institutions locally owned

- African Banking Corporation Ltd.
- Jamii Bora Bank Ltd.
- Commercial Bank of Africa Ltd.
- Co-operative Bank of Kenya Ltd.
- Credit Bank Ltd.
- Charterhouse Bank Ltd.
- Chase Bank (K) Ltd.
- Dubai Bank Kenya Ltd
- Equatorial Commercial Bank Ltd.
- Equity Bank Ltd.
- Family Bank Ltd.
- Fidelity Commercial Bank Ltd.
- Fina Bank Ltd.
- Giro Commercial Bank Ltd.
- Guardian Bank Ltd.
- Imperial Bank Ltd.
- Investment & Mortgages Bank Ltd.
- Middle East Bank (K) Ltd.
- NIC Bank Ltd.
- Oriental Commercial Bank Ltd.
- Paramount Universal Bank Ltd.
- Prime Bank Ltd.
- Trans-National Bank Ltd.
- Victoria Commercial Bank Ltd.

II. Institutions listed on the NSE

- Barclays Bank of Kenya Ltd.
- CFC Stanbic Bank Ltd.
- Equity Bank Ltd.
- Housing Finance Ltd.
- Kenya Commercial Bank Ltd.
- NIC Bank Ltd.
- Standard Chartered Bank (K) Ltd.
- Diamond Trust Bank Kenya Ltd
- National Bank of Kenya
- Co-operative Bank of Kenya Ltd

APPENDIX II: DATA COLLECTION SCHEDULE

The student will obtain a letter from the University that will grant her the permission to collect data. Data will be collected from Central Bank of Kenya. The study will collected secondary data in one day based on the availability and accessibility of the data. Below is the data collection schedule that will guide the researcher on important variables during data collection and the period upon which data will be collected.

Parameters	**Company**		**Year**			
	Commercial Banks	**2010**	**2011**	**2012**	**2013**	**2014**
Asset Liability Management (measured using loan to deposit ratio by computing average net loans/average deposits {5 years})						
Data on the size of the firm (natural logarithm of total assets)						
Current ratio (measured using current assets/current liabilities).						
Financial leverage (debt to equity ratio; will be measured using total liabilities/total assets)						
Financial performance (return on assets=net income/total assets).						