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THE EFFECT OF ASSET LIABILITY MANAGEMENT STRATEGIES AND REGULATION ON PERFORMANCE OF COMMERCIAL BANKS IN LESOTHO

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March 2017

DECLERATION

I, Robert Thejane, (Student Number 818791), declare that this project paper is the results of my independent work and investigations and has not been published, submitted elsewhere, or for the requirements of the requirements of Masters of Management in Finance and Investment at Wits Business School (WBS). Any work done by others and cited within this report has been duly acknowledged and included in the reference list. I also declare that I have been given authorization by a panel from the research committee of Wits Business School.

Signed:_____

ABSTRACT

This study assesses the effect of Asset Liability Management Strategies on Performance of Commercial Banks. That is, those factors that are responsible for differences between returns generated on assets and costs incurred on liabilities by banks in Lesotho. The study also investigates the impact of bank regulation on banks performance. The study results suggest that only one regulatory variable namely Capital adequacy ratio has a strong influence on the profitability of commercial banks in Lesotho. The other regulatory variable namely Liquidity ratio has a negative but statistically insignificant impact on banks' performance while AML variable, Gap ratio, has positive but also statistically insignificant impact on banks performance. Furthermore, the control variables have positive, insignificant impact on banks performance.

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1. CHAPTER ONE

1.1. Introduction

The purpose of this chapter is to introduce the thesis. The chapter is organized as follows: Section 1.1 presents the context of the study. Section 1.2highlights the problem that justifies the research. Section 1.3 presents the objectives of this research. Section 1.4 identifies the gap in the literature that this research aims to fill. Section 1.5 discusses the benefits of the study .Section 1.6 presents the structure of the thesis and chapter summary concludes the chapter.

1.2. Context of the study

Financial institutions play a very important role in the economy of both developing and developed countries. Levine (2004) states that the role of the financial system is to: one, produce information ex-ante about possible investments and allocate capital. Two, monitor investments and exert corporate governance after providing finance. Three facilitate the trading, diversification and management of risks. Four, mobilise and pool savings. Five, ease the exchange of goods and services. When financial institutions do a correspondingly better job at providing the above functions, financial development occurs and by extension, economic development is experienced too.

In many developing countries the financial sector is dominated by banks, implying that the growth augmenting effect of the financial sector will depend on the performance of banks. Mahomed (2013) posits that one of the measures of a bank's performance is its profitability in a given year. However, in their intermediating role, banks incur costs on their liabilities and earn income on their assets. This implies that balance sheet management is of utmost importance in banks including its s composition, volume, and maturity of assets and liabilities that a bank holds at any particular period, and the relationship between the balance sheet items is critical in profit maximisation. This fact is also supported by Sayeed and Hogue (2012) who found that profitability of banks is directly affected by management of their assets and liabilities.

In Lesotho, the financial sector consist of banking, insurance, and other non-banks financial institutions industries (Supervision annual report, 2014). However the banking industry is the main sub-sector with assets equivalent to 42.3 percent of GDP (Jefferis and Manje, 2014). Thus, the performance of banks in the country is the one that is likely to determine the impact of the financial sector in the economy.

Given these special role that banks play in the economy, it is imperative that they are regulated and supervised, not only to protect depositors and consumers, but also to ensure the stability of the entire financial system (Vianney 2013). Banks invests with each other through the inter-bank market, which implies that failure of one can have a significant negative impact on the entire system. Regulation therefore, safeguards the industry against systemic risk (Vianney 2013). In Lesotho, the Central Bank of Lesotho is the institution that is mandated to regulate and supervisee commercial banks. This is achieved through promulgation of laws and regulations that banks are expected to comply with at all times, and through both off-site and on-site surveillance.

Different banks have different funding structures, but customers' deposits are the major sources of funding for all commercial banks. As highlighted by Somasheker (2009), accepting deposits is the primary function of a commercial bank. Commercial banks fund their balance sheet in layers. The first layer is the capital base which comprises of shareholders' equity, subordinated debt, and hybrid of medium and long-term senior debt. The second layer is the customer deposits, which consists of both wholesale deposits, which are considered volatile, and retail deposits which are considered stable. The last layer comprises of various short-term liabilities such as commercial paper, certificates of deposit, repurchase agreements and short-term bonds (ECB 2009). In Lesotho, as highlighted in Banking Supervision Division (2016), Commercial banks fund their balance sheet through shareholders' equity, customer deposits, and deposits from other banks both in Lesotho and outside. As at December 2016, 67% of these deposits were wholesale deposits (Banking Supervision Division 2016).

1.3. Research problem

Historically, banks in Lesotho have always relied more on wholesale funding. For instance as at 30 June 2016 wholesale deposits constituted 73 percent of the banks' total funding base. (See also figure 1 for a trend). The reliance on wholesale deposits poses a threat not only to the profitability of banks but also to the stability of the entire banking system at large. This is because wholesale funding is usually considered to be expensive and volatile. Beau et al, (2014) states that wholesale investors are typically more focused on obtaining a return from their investment in the bank, just as they would if they had invested in any other type of business than desiring safe-keeping services, while retail depositors do not. This therefore indicates that in Lesotho, commercial banks profitability can be improved by increasing retail deposits which are considered less expensive and reducing wholesale deposits. The responsibility of fostering a safe and sound financial system in Lesotho is a task bestowed upon the Central Bank of Lesotho (CBL), through the central bank act 2000. To this effect the CBL has promulgated prudential regulations for banking institutions in 1999 which were amended in 2016. Majority of these regulations[1] are however skewed towards regulating the asset side of commercial banks' balance sheets, with the only exception being the foreign currency exposure Limit regulations which focuses on both asset and liability sides. The problem is that it is not entirely clear how the CBL new regulations affected banks asset and liability management strategies and their performance at large.

1.4. Research objectives

1.4.1. General objective of the study

The overarching objective of this study is to assess the impact of CBL regulations on the banks asset liabilities management strategies through an assessment of those strategies on the banks performance.

[1] For instance the Financial Institutions (Lending limits) Regulations 2016.

1.4.2. Specific objectives of the study

Specifically, this study will address the following objectives;

- To understand different asset liability management strategies used by commercial banks in Lesotho
- To assess the impact of regulatory requirements on commercial banks performance
- To examine the impact of asset liability management strategies on the performance of commercial banks in Lesotho.
- To outline policy implications based on the findings of the study.

1.5. Gap in the literature

There have been several studies that have been conducted on Lesotho financial sector. For instance, Thamae (2014) conducted a study with the objective of identifying the major drivers of excess liquidity in Lesotho banking sector and analyse their impact on liquidity so as to suggest appropriate policy measures for minimizing it. He found that excess liquidity is caused by the fact that Lesotho financial sector is undeveloped as indicated by significant ratio of private sector credit to GDP. Our banks do not offer variety of products. They focus more on consumer loans instead of extending credit to the private sector, and as a result, they are forced to place their excess funds with the Central Bank through Treasury bills which are considered as part of liquid assets. Maruping (1989) assessed the adequacy of Lesotho's financial system and the appropriateness of the mode of operation and suggest some options available for Lesotho. He found Lesotho financial system to be fairly sound with a need for some improvements in the operations of some institutions. Motelle (2011) on the other hand, conducted a study with the aim of empirically establishing the effect of remittances on financial development in Lesotho. He found that remittances have a long run effect on financial development, however do not cause financial development. Other studies include Mohapi and Motelle (2006), Makhetha and Sebolelo (2015), and Odhiabmo (2010). However, majority of these studies focus on the role of the financial sector in

fostering economic growth. The studies have do not assess the financial performance of Lesotho commercial banks. Thus, there is still a need to fill this research lacuna.

1.6. Benefits of the study

The study may provide awareness to banks management, especially the Asset and liability Management Committee (ALCO), on the appropriate mix of assets and liabilities that maximizes banks profitability so as to create value for the shareholders. The Central Bank of Lesotho may also use this study as a base to improve its regulation of the industry. Those interested in understanding the inter-relationship between the actions of the Regulator on one hand, such as promulgation of regulations, and actions of commercial banks on the other hand, and their impact on banks profitability, will also benefit from this study. The researcher himself gets the opportunity to gain some knowledge from the study.

1.7. Structure of the thesis

Following this introductory section, the rest of the thesis is structured as follows; Chapter two reviews the related literature. Chapter three describes the research methodology employed to achieve the objectives identified in Section 1.3. Chapter 4 presets the results. Chapter 5 provides discussion, conclusion and relevant recommendations that emerge from the study.

Chapter Summary

The preceding chapter has provided the context of the study. The research problem that has triggered this study, the goals that the researcher wants to achieve and the gap identified in literature are also covered in this chapter. The chapter provided of the benefits of this study .The last section of this chapter provided a summary of all other chapters to follow. The next chapter presents the literature review.

2. CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter discusses the theoretical and empirical evidences on the effect of asset liability management strategies and regulation on commercial banks profitability is presented. Section 2.1 presents an overview of the banking industry in Lesotho. Section 2.2 discusses the nature of banking business in Lesotho. Section 2.3 discusses the asset liability management in banks. Section 2.4 covers the banks' financial performance, Section 2.5 presents the banking regulation. Section 2.6 covers bank regulation and financial performance, Section 2.7 presents about the Basel Committee and Basel Accord (Basel I).

2.2 Overview of banking industry in Lesotho

Lesotho's banking sector has evolved slowly since independence in 1966. The industry underwent significant changes over the last couple of years. The industry can be traced as far back as 1902 with Standard bank which was joined by Barclays bank in 1975. The two banks were later joined by Lesotho bank 1972 (Thamae 2014). Due to the fact that these banks, at this time, were not playing intermediation role in Lesotho, but rather collecting deposits from Basotho and channeling them to South Africa, the Government of Lesotho was forced to intervene through the enactment of the Financial Institutions Act (FIA) 1973 which required banks to hold a certain amount of their assets locally (Maruping 1989).

In 1978, a Monetary Authority, which became operational in 1980, was enacted so as to provide oversight over the Lesotho's financial sector. In 1982, the authority was given more powers and was elevated to the now called Central Bank of Lesotho (Thamae 2014). Currently, there are four commercial banks licensed and operating in Lesotho namely Standard Lesotho Bank (SLB), Nedbank Lesotho (NBL), First National Bank Lesotho (FNB), and Lesotho Postbank (LPB). Three of them, SLB, NBL and FNB are subsidiaries of South African banks. In 1995, Standard Bank of South Africa bought Barclays Bank Lesotho and named it Stanbic bank Lesotho. In 1997, the name changed to Standard Bank Lesotho. The bank then bought some shares in old Lesotho Bank

which was 100% Government- owned and the bank was renamed Lesotho Bank 1999. The two banks, Standard Lesotho Bank and Lesotho Bank 1999, then merged in 2006 and the new entity was named Standard Lesotho Bank. Standard Lesotho Bank is 80% owned by Standard Bank Group, 10.4% owned by Lesotho Unit Trust, and 9.4% by the Government of Lesotho. The bank has branches in all the ten districts and ATM country wide. It is the largest bank in the country in terms of assets size, deposit and loans, followed by Nedbank Lesotho, First National Bank Lesotho and Lesotho Postbank respectively. (Banking Supervision 2016).

Standard Chartered Bank Lesotho, which was a resultant merger of Standard Bank and Chartered Bank, was taken over by Nedbank Limited South Africa in 1997 and was named Nedbank Lesotho. The bank is 100% owned by Nedbank Limited South Africa. It has 8 branches, 1 agency and ATMs countrywide (Banking Supervision 2016).

First National Bank Lesotho, which is the division of First Rand Bank Limited, and third largest in the industry, commenced operations in 2004 as a branch. In 2005, Wesbank, which is another division of First Rand Bank Limited focusing on asset finance, was established within FNB Lesotho. In 2008, after opening another branch in Maputsoe, the bank applied to be licensed as a subsidiary since the branch licence could not allow it to open more branches. The bank currently has three branches in Maseru as well as branches in Teyateyaneng, Maputsoe, Hlotse, Butha Buthe, and Mafeteng. The bank is one of the leading bank in technology, its digital channels provides its customers with convenient way of transacting without need for them to go to the branch (Banking Supervision 2006).

Lesotho Postbank is the smallest bank, in terms of market share. This bank is 100% owned by the Government of Lesotho and was established in 2004. It started its operations under a restrictive banking license, which allowed it to only accept deposits from the public and invest. Its target market was the under banked and un-banked Basotho in both urban and rural arrears. In 2009, the Central Bank of Lesotho granted the bank a full banking license allowing it to operate as a fully-fledged commercial

bank. The bank has to date, rolled out 13 branches, 10 ATMs and 37 point of sales (Banking Supervision 2006). All the four banks are licensed under the Financial Institutions Act, (FIA) 2012 and regulated by the Central Bank of Lesotho through both of-side and on-site surveillance.

2.3 Nature of banking business

Banks differ from non-bank financial institutions in that they take deposits and provide liquidity services to their depositors through check writing, ATMs, and other transaction services such as wire transfers, bill payments, etc; (Suresh and Zhenyu, 2014). These services are not provided to the people for free because the main aim of any commercial bank whether Islamic or otherwise is basically earning and maximization of profit (Faroog and Khan 2012). Banks take deposits from those with excess liquidity and lend to those in need of money. This process is heavily regulated around the world including in Lesotho. The stability of commercial banks as whole in the economy depends on proper asset liability management structures. Better assets liability management has the tendency to absorb risks and shocks that commercial banks face (Makau and Memba 2014). Commercial banks incur costs for their liabilities and earn income from their assets. Thus, profitability of banks is directly affected by management of their assets and liabilities (Sayeed and Hogue 2010).

According to Charumathi (2008), banks are always aiming at maximizing profitability at the same time trying to ensure sufficient liquidity to repose confidence in the minds of the depositors on their ability in servicing the deposits by making timely payment of interest and returning them on due dates as well as meeting all other liability commitments as agreed upon. A bank's assets typically have much longer maturities than its liabilities. Thus, customers are due to repay their bank loans (the bank's assets) over a long period of time, whereas depositors and investors in a bank may – in many cases – withdraw their money (the bank's funding) at a much shorter notice or even 'on demand'. Given this 'maturity mismatch' between assets and liabilities, a continuing challenge for banks is to ensure that new funding replaces maturing funding in similar

amounts and in a timely manner in order to continue to support a relatively stable pool of assets, (Beau, et al, 2014).

Banks are now moving away from the traditional lines of services, such as check, counter payment and bank drafts into technology based services. Ozsoy and Sayfullin (2006) show that technology has changed the way banks operate. For example, automated teller machine (ATM) reduce personnel costs; debits and credits cards ease payments and reduce check processing costs; phone banking increases competitive ability; online banking increases competitive ability by instant access to the bank account and payment transfer options, and internet banking captures customers habits to trade in cyberspace. However, these innovations come with more risks for commercial banks such as Information Technology (IT) risks.

One of the ways for managing the risks inherent in banking business is Asset Liability Management (ALM) (Prathap 2013). ALM is concerned with strategic management of assets (uses of funds) and liabilities (sources of funds) of banks, against various risks such as liquidity risk, interest rate risk, exchange rate risk, and contingency risk (Sheela and Bastray, 2014). They indicated that banks management needs to maintain a good balance between profitability and stability and the most important thing for bank management is to manage market liquidity risk and interest rate risk. They further highlighted that banks need a framework which enables them to combat these risks and help them to optimize the performance of the banks, and in this scenario, ALM is very useful and helpful tool to analyse the liquidity and interest rate risk for the bank.

Different strands of research define ALM in different ways. ALM is the management of the bank's balance sheet mix, maturities, and costs in a way that maximizes earnings within the bank's risk appetite. The ALM function involves controlling the volatility of net income, net interest margin, capital adequacy, liquidity risk and ensuring an appropriate balance between growth and risk (Muchangi 2012). Sheela and Bastray (2014) define ALM as a process that is concerned with strategic management of assets (uses of funds) and liabilities (sources of funds) of banks against various risks such as liquidity

risk, interest rate risk, exchange rate risk, credit risk and contingency risk, while Charumathi (2008) defines ALM as a dynamic process of planning, organizing, coordinating and controlling the assets and liabilities – their mixes, volumes, maturities, yields and costs in order to achieve a specified net interest income (NII). The NII is the difference between interest income and interest expenses and is the basic source of banks profitability. Oracle white paper (2008) defines a comprehensive ALM policy framework as the one that focuses on bank profitability and long term viability by targeting the net interest margin (NIM) ratio and net economic value (NEV) subject to balance sheet constraints. Significant among these constraints are maintaining credit quality, meeting liquidity needs and obtaining sufficient capital. Banks operate a range of business models, which lead them to have very different assets and liabilities structures, (Beau et al, 2014). There are four steps in banks' Asset-Liability management process and these are: liquidity management, asset management, liability management and capital management (Christiansen 2012).

Liquidity refers to the ease and quickness with which assets can be converted to cash (without significant loss in value). Current assets are the most liquid and include cash and assets that will be turned into the cash within a year from the date of the statement of financial position (Hillier et al. 2013). Landskroner and Paroush (2011) define liquidity risk as the bank's inability to meet its liquidity needs because of bank-specific problems or because of a market liquidity shortage in times of crisis. They further indicated that liquidity risk is one of the major risks faced by financial intermediaries and banks in particular, and this was clearly demonstrated in the recent financial crisis**.** The banking industry is prone to the risk of liquidity shortage arising from its function of providing liquidity by converting liquid deposits into long-term illiquid loans (Christiansen 2012). It is therefore clear that liquidity management is very important to the viability of banks.

Liquidity risk management is of importance because a liquidity shortfall at a single institution can have an impact on the whole financial system (Risk management guidelines for financial institutions, 2009). Liquidity management involves primarily

balancing the cost-benefit tradeoff between profitability and risk of illiquidity. A bank should not improve profitability at the expense of trying up cash, while at the same time, it should also not improve its liquidity position at the expense of profitability. A high level of liquidity, that is, a bank's holding of a stock of high quality liquid assets (liquidity warehouse), indicates a capacity to meet liquidity needs and take advantage of business opportunities. However, such assets are generally associated with lower returns; thus, too much liquidity will reduce profitability, (Landskroner and Paroush 2011). In Lesotho, banks are required to hold twenty five percent (25%) of their liabilities in liquid assets which are defined as those maturing within a period of one year.

The purpose of the bank's assets is to generate income for stockholders and meet interest needs of the banks claimants e.g. depositors and employee salaries. Therefore, it is important that banks maintain a portion of their assets in liquid form in order to meet the immediate needs of its creditors (Christiansen, 2012). For banks to be able to meet their liquidity needs and while at the same time earning sufficient returns, they have to manage their assets by maintaining a high percentage of income -generating assets and minimizing risk through diversification. Christiansen (2012) highlighted that risk diversification can be achieved by issuing different loans to different groups of customers, i,e. business, household and corporations. Within business, diversification can also be achieved through lending to different sectors such as agriculture, mining, textiles, constructions, etc. Asset management also involves a decision on how much liquid assets and reserves a bank should hold at any given time considering that liquid assets tend to have low returns. This means holding of excessive liquid assets might have a negative impact on the banks profitability. Therefore, holding a well-diversified portfolio of assets that are liquid is vital for the bank to meet its immediate needs at a lower cost as compared to raising funds from capital markets, (Christiansen, 2012). However, banks profitability should also be taken into consideration.

Liabilities are obligations of the firm that require a payout of cash within a stipulated period. Many liabilities involve contractual obligations to repay a stated amount and

interest over a period. Thus, liabilities are debts and are frequently associated with nominally fixed cash burdens, called debt service, that put the firm in default of a contract if they are not paid, (Hillier et al, 2013). The goal of liability management is to have control over the funding sources of the bank. The key control is price (i.e. the interest rate and other terms offered on deposits and other borrowings) as it plays a role in achieving the volume, mix and cost desired. The desire to open up new sources of funding has resulted in larger and more complex money and bond markets. This means that an attractive lending opportunity can be easily funded by issuing bonds. Thus, debt as a source of funding has gained significant importance as compared to deposits, (Christiansen, 2012).

The bank's major liabilities are deposits from customers. These deposits can be broadly categorized as retail and wholesale deposits. Retail deposits or funding refers to various types of deposits that households and small companies keep with the bank. This type of funding is 'unsecured' since depositors do not ask the bank to give them collateral as a guarantee for keeping hold of their money, (Beau et al, 2014). Wholesale funding on the other hand is funding from big companies such large corporates, pension funds, insurance companies and other companies. These investors are typically more focused on obtaining a return from their investment in the bank just as they would if they had invested in any other type of business, than just desiring payment or safe-keeping services, (Beau et al 2014). Wholesale deposits are also considered more volatile than retail as these investor deposits large sums of moneys such that withdrawal by just one company exposes the bank to liquidity risk. They are also more expensive than retail deposits. Hence need for the banks to try and maintain a good balance between retail and wholesale deposits so as to reduce funding costs.

Capital can be defined as money contributed by the shareholders. Farag et al (2013) defines capital as bank's own funds, rather than borrowed money such as deposit. They indicate that bank's own funds are items such as its ordinary share capital and retained earnings – in order words, not money lent to the bank that has to be repaid. They further indicate that, taken together, these own funds are equivalent to the difference

between the value of total assets and liabilities. All in all, capital can be regarded as a backbone of any business; in banks, by acting as a protection against losses resulting from risks they are exposed to through their intermediation function (Christiansen2012). There are two other important characteristics of capital. First, unlike banks liabilities, capital is perpetual, that is, as long as the bank continues in business, it is not obliged to repay the original investment to capital investors. They would only be paid any residue in the event that the bank is wound up, and all creditors had been repaid. Second, typical, distribution to capital investors (dividends to shareholders for instance) are not obligatory and usually vary over time depending on the banks profitability (Faraget al, 2013).

Minimum capital requirements regulations are promulgated in different countries which set minimum capital that banks should hold in line with their risk -weighted assets. These regulations are issued based on international standards issued by the Basel Committee on Banking Supervision. Lesotho is currently on Basel 1, and banks are therefore required to hold a minimum capital of 8 percent of risk-weighted assets.

2.4 Financial Performance

Anjili (2104) defines financial performance as a measure of how well a firm can use assets from its primary mode of business and generate revenue. He highlights that, the term, can also be used as a general measure of a firms overall financial health over a given period of time and can be used to compare similar firms across the same industry or to compare industries or sectors in aggregation. There are several factors, both internal and external, that affect the bank's profitability. The internal factors are micro or bank-specific variables that are products of bank business activities and are affected by bank level management (Owoputi et al, 2014). The level of capital the bank holds, liquidity position, the quality of the bank's assets, management of costs and risk management systems and practices in place, are all internal factors that affect the bank's profitability. The external factors on the other hand, are not linked directly to the bank management activities, but are products of social, economic and legal environment that affect the operation and performance of banking industry (Owoputi et

al, 2014). Athanasoglou et al (2005) investigated the effect of bank-specific, industry-specific and macroeconomic determinants on bank profitability. He described bank-specific determinants of profitability as operating efficiency and financial risk, industry-specific factors as industry concentration and the ownership status of banks, and finally for macroeconomic factors, he includes cyclical output and expected inflations.

2.5 Banking regulation

The banking industry is one of the most regulated in the world because of its importance in the economy and Lesotho is not an exception.. Banking regulation originates from microeconomic concerns over the ability of bank creditors (depositors) to monitor the risks originating on the lending.it also originates from micro and macroeconomic concerns over the stability of the banking system in the case of a bank crisis (Bonn 2005). As a result, competition has come to play a very important role in the allocation of credit and in the improvement of financial services. Heimler (2006) indicates that a more market -oriented approach to banking regulation started with Basel accord of July 1988. He highlighted that the accord required major international banks in a group of twelve (12) countries to attain an 8% ratio between capital and risk weighted assets from the beginning of 1992. Kebede (2014) on the other hand indicates that financial regulation can be classified into three groups namely; structural regulation, prudential regulation and monetary regulation. He defines structural regulation as setting boundaries on commercial banks determining the activities that they can participate in and those they cannot. Prudential regulation emphasizes the control of systemic risk through principally balance sheet constraints such as capital adequacy and permissible bank concentration ratios. Generally prudential regulation establishes guidelines with the intention of maintaining safety and soundness of the banking system. Monetary regulation is the process of setting monetary policy directives designed to bring about predetermined macroeconomic outcomes by focusing on interest rates, credit controls and primary and secondary reserve requirements.

Although banks are operated for profit and bankers are free to make decisions in their daily operations, banking is commonly treated as a matter of public interest. Banking

laws and regulations extend to many aspects of banking, including who can open banks, what products can be offered, and how banks can expand, (Spong, 2000). The purpose of regulation can therefore be broken down into three parts, protection of depositors, efficient and competitive financial system and consumer protection.

The most important reason why banks should be regulated is to protect depositors' funds. It serves to protect depositors while also ensuring the safety and soundness of the financial system. The priority when setting regulatory goals should be given to depositors while also maintaining stability. Regulations can either be preventive, such as requiring banks to maintain a certain amount of capital and liquid assets, or it can be curative such as ensuring that depositors are protected. The public holds a higher percentage of their funds in banks and most of their financial transactions are carried out through banks. Since for customers to obtain bank services such as credit, they are required to maintain deposits accounts with banks, they assume the role of bank creditors and have an interest in the bank's performance like any other stakeholder. Furthermore, only a portion of customers' deposits is held with the central bank as cash reserves while the larger portion is held in liquid assets and also lend out to customers. In Lesotho, only three (3) % of deposits liabilities is held with the Central bank of Lesotho as required cash reserves and 25% in liquid assets while the remaining 72% can be lend out and invested. Therefore, depositors' protection is linked to many other factors such as quality of Assets, which means that it may be difficult for depositors to assess the performance of the banks as this information may not all be publicly available. For this reason, most Central Banks are under pressure to regulate banks so as to protect depositors. Spong (2000) highlighted that while depositors could conceivably make general judgments about the condition of banks, the task would still be difficult, costly, and occasionally prone to errors. Efficient and competitive financial system

Another aspect of a good banking system is that customers are provided quality services at competitive prices. One of the purposes of bank regulation, therefore, is to create a regulatory framework that encourages efficiency and competition and ensures

an adequate level of banking services throughout the economy, (Spong, 2000). He indicated that competition is a driving force in keeping banks innovative in their operations and in designing new services for customers. Claessens (2009) highlighted that competition in the financial sector matters for a number of reasons. As in other industries, the degree of competition in the financial sector matters for the efficiency of production of financial services, the quality of financial products and the degree of innovation in the sector. Dodge (2005) indicated that regulation should be designed so that investors are able to adequately gauge the risks and potential returns of an investment. He further highlighted that the goal of regulation should not be full disclosure of all information, rather, the aim should be to reduce information asymmetries to the point that the benefits of disclosure still outweigh the costs of compliance. In that way, regulation can lead to a more efficient financial system.

Regulations which are intended to protect consumers have been issued in a number of jurisdictions around the world. Regulation such as those requiring banks to disclose bank charges and interest rates have been issued and are intended to give consumers a basis for comparing and making informed choices amongst different banks. Fair treatment and equal access to the financial services are also ensured by regulators through issuance of these regulations. Spong (2000) highlighted that other purposes associated with consumer protection include promoting financial privacy and preventing problems and abusive practices during credit transactions, debt collections, and reporting of personal credit histories.

2.6 Non Regulation of Banks

The most important reason for regulating banks is to address concerns around safety and stability of individual banks and the banking industry as a whole (Bonn 2005). Non regulation of the banking industry poses a number of risks not only to the banks but also to the economy. It is well know that whenever depositors start to doubt the insolvency of their bank, their first reaction normally would be to withdraw their monies creating liquidity problem for the banks (Bonn 2005). It is also know that the primary role of a commercial bank is intermediation, taking liquid deposits redeemable on

demand from customers and turning them into illiquid assets. So if banks are not required to hold certain portion of their assets in liquid form (Liquidity regulations) they would not be able to meet their customers demand, triggering bank runs. And as highlighted Dionne (2003), bank runs usually generate systemic risk do real damage because they interrupt the flow of profitable investments and real consumption.

Since loan granted by banks are normally financed through customers deposits, they have an incentive to take excessive risks. This incentive can be mitigated by regulations (Bonn 2005).this is supported by Marques et al (2014), who argued that the run up to the global financial crisis was marked by excessive risk taking in the financial sector. And this excessive risk taking, they argue, was created by incentive structures at some financial institutions. They further indicate that, to tackle this excessive risk taking issue, the post crisis financial reforms focused in part on improving the regulation of corporate governance in banks and banks executives' pay.

An efficient payments system, in which payments are done in full and on time, is a prerequisite for an efficient macro economy. Disruptions in the payments systems can result in significant disruptions in the aggregate economic activity (Bonn 2005). This further indicates how risky it is not to regulate banks.

2.7 The Basel Committee and Basel Accords

The Basel Committee on Banking Supervision has its origins in the financial market turmoil that followed the breakdown of the Bretton Woods systems of managed exchange rates in 1973, and in response to this and other disruptions, the Central bank governors of the G10 countries established a committee on Banking Regulations and Supervisory Practices at the end of 1974. The Committee was designed as a forum for regular cooperation between its member countries on banking supervisory matters. Its aim was and is to enhance financial stability by improving supervisory knowhow and the quality of banking supervision worldwide, (BCBS, 2015).

2.7.1 The Basel Accord I (Basel I)

The Basel Committee on Banking Supervision published a set of minimum capital requirements known as Basel I in 1988 with the focus mainly on credit risk. It introduced a framework for measuring the banks' capital. The model adopted by the Basel Committee had two main characteristics (Christiansen 2012). First, it strived to provide adequate capital cushion for credit risk, and secondly, to measure credit risk by relying on the risk assets ratio and solvency ratio. The minimum capital requirements were therefore sets and the risk weights were assigned to different classes of assets. Risk weighted assets were then determined using different risk weights and banks were required to hold total capital equivalent to 8% or more of their risk weighted assets and Tier I capital equivalent to 4% or more of their risk weighted assets. The final product proposed by the committee was divided into four pillars (Balin 2008). The first pillar defines the components of capital. It divides capital into two tiers, tier I (core capital) and Tier II (supplementary capital). Tier I consists of equity capital and disclosed cash reserves, while tier II capital consists of fixed assets revaluation reserves, hybrid debt capital instruments, general reserves for losses on assets among others.

The second pillar provides the risk weights to be assigned to different banks assets. Five risk categories, each with different weights, were introduced. Category one, which weights assets at 0%, effectively categorizing them as risk free assets, category two which weights assets at 20%, category three which weights assets at 50%, category four which assigns a 100% weight to assets and the last category, category five which leaves it as a central banks discretion to assign 0, 10, 20 or 50% weights to assets falling in that category. The Basel I accord was amended in 1996 to incorporate market risk.

One of the merits of the accord was that it had pre-determined risk weights which made implementation easy (Seliane and Sello 2015). However, after its implementation, a number of weaknesses and criticisms were raised. Some of them were the fact that it did not cover market discipline and that initially it was targeting G-10 countries only and focused on credit risk. Furthermore, other risks such as operational and liquidity risks

were not covered by the accord. So the Basel II and finally Basel III were introduced in order to fill these gaps.

2.7.2 Basel Accord II (Basel II)

In response to the 1990 banking crisis and a number of criticisms of Basel I mentioned above, the Basel Committee proposed a more comprehensive capital adequacy accord which expanded the scope, technicality, and depth of the original Basel accord (Balin 2008).It expanded the pillar framework that was introduced in Basel I in order to cover market, operational, and interest rate risks that were not covered by Basel 1 (Balin 2008). The final accord, Basel II, was introduced in 2004 after going through an extensive consultative process (Christiansen 2012). The main objectives of the Basel II were to strengthen the safety and soundness of the international banking system and also ensure that there is competitive equality among internationally active banks (Seliane and Sello 2015). The three pillars, minimum capital requirements, supervisory review process and market discipline were introduced in order to achieve the said objectives.

For credit risk, the standardised approach and the internal rating based approaches were introduced on which banks choose for computing capital charge for credit risk. Under the internal rating based approaches, two ratings, foundation internal rating approach and advanced internal rating approach were introduced. For calculation of capital charge for operational risk, the accord provided three approaches, the basic indicator approach, the standardised approach and the advanced measurement approach. Lastly, for market risk, two approaches, the building block approach and internal models approach were introduced.

Pillar II focuses on supervisory review process. It gives the supervisors powers to determine the appropriate amount of capital that banks should hold, to review the banks models used to calculate capital and be able to exercise their powers if a banks' capital declines (Seliane and Sello 2015)

Pillar III focuses on increasing market discipline within each countries banking sector. Important information such as bank's capital and risk-taking position, that were initially shared with regulators only, are recommended to be disclosed to the general public (Balin 2008)

2.7.3 Basel accord III (Basel III)

Basel Committee on Banking Supervision released several reforms to Basel II as a result of a number of weaknesses that were identified on the accord and collectively these reforms were referred to as Basel III (Seliane and Sello 2015). The aim of these reforms is to strengthen the banking sectors ability to absorb shocks arising from both financial and economic stress, and therefore reduce the risk of spillover from the financial sector to the real economy (BCBS 2011). This is to be achieved by ensuring that banks maintain sufficient capital buffers. Focus was placed on five significant areas namely, enhanced quality of capital, enhanced quantity of capital, reduced leverage through introduction of backstop ratio, enhanced short term liquidity coverage, and enhanced counterparty credit risk (Bhatia et al 2015). The new framework maintained the three pillars as in Basel II with major changes in pillar I (Christiansen 2012). They improve both the quality and quantity of the regulatory capital base and enhance risk coverage. Moreover, the committee introduced the global liquidity standards, the liquidity coverage ratio and the net stable funding ratio that banks are required to maintain. Emphasis is put on requiring banks to maintain sufficient stock of high quality liquid assets to meet short term financial stress (Swamy 2012).

2.8 Review of empirical studies

Anjili (2014) conducted a study to examine the effect of asset and liability management on the financial performance of commercial banks in Kenya. The study covered the period 2004 to 2013. He found that all the CAMEL factors, being capital adequacy, asset quality, management efficiency, Earnings, and liquidity, had a statistically significant impact on the financial performance. He therefore recommended policies that would encourage banks to diversify their revenue sources, reduce operational costs, minimize credit risk, and minimise liquidity holdings.

Kebede (2014) also conducted an empirical study on private commercial banks in Ethiopia to determine the impact of National Bank Regulation on their performance. Three regulatory factors, namely reserve requirement, credit cap, and bill purchases, which affect bank's performance were selected and analysed. The results showed that both bill purchases and credit cap have negative and statistically significant impact on banks profitability while reserve requirement also had a negative impact which is however statistically insignificant.

Njogo et al (2014) used the statistical cost accounting (SCA) Model to examine the effect of asset and liability management on commercial banks performance in Nigeria covering the period 2008 to 2012. They found that there is a positive and strong relationship between assets and liabilities management and banks profitability. They, therefore, recommended that banks maximize assets availability in order to meet increasingly complex liabilities. They further recommended that banks should manage interest rate risk which could lead to a mismatch of assets and liabilities and should try to manage a mismatch which is brought about by the fact that banks borrow short term and lend long term, through restructuring of their balance sheets or through the use of other means such as derivative instruments.

Furthermore, secondary data from the annual financial statements of 44 commercial banks in Kenya for the period 2010 to 2014 was used by Obari (2015) to assess the effect of asset liability management on profitability of commercial banks in Kenya. He found that there is a significant positive relationship between bank size and financial performance and a significant negative relationship between capital structure and financial performance. He, therefore, recommended that banks management should devise strategies to attract more deposits and other low cost funding so that potential liquidity mismatches is managed to avoid resorting to expensive debt capital.

Kale et al (2015) assessedthe effects of regulation on performance of banks: evidence from the Turkish banking industry, investigated the effects of regulation, macroeconomic changes, and political events on the efficiency of the Turkish banks

during the period 1997 to 2013. The results revealed that during the period 1997 to 2001, the efficiency of the Turkish banking industry deteriorated and an improvement after the year 2001. They further found that internal factors were more effective than external factors in production. Lastly, they found that tighter regulation, monitoring, restrictions, strong supervision, more capital and new reforms have a positive impact on efficiency. .

Sheela and Bastray (2014) studied the effect of Asset Liability Management on Commercial bank profitability in Indian financial markets by taking into consideration two public sector banks namely Union Banks of India and Indian Bank. They conducted the multivariate statistical technique and ratio analysis to study the nature and strength of relationship between the assets and liabilities in these two banks. They found that the two banks have a good ALM framework in practice. The study also indicated a strong relationship between assets and net worth for both banks.

Guthua (2013) investigated the effect of Asset Liability management on the liquidity risk on the commercial banks in Kenya. SPSS version 20.0 was used for analysis. The test for significance was the t-test and computing the correlation coefficient (r), coefficient of determination and analysis of variance (ANOVA). The results of the regression analysis showed that there is a significant positive relationship between independent variables(ROE, Capital Adequacy, Loan-to-deposit ratio, ROA, total assets, asset liability management policies, liquidity, stress testing and contingency funding plan) and the dependent variable (Liquidity risk of commercial banks).

Habtamu (2012) used multiple linear regression models to investigate determinants of private commercial banks profitability in Ethiopia by using a panel data of seven commercial banks from year 2002 to 2011. He used three measures of profitability namely Return on assets (ROA), return on equity (ROE), and N\net interest margin (NIM). The results revealed that bank specific factors, namely capital adequacy, managerial efficiency, bank size, and macroeconomic factors, level of GDP, and regulation, have a strong influence on Ethiopian private commercial banks profitability.

Ponce (2012) analysed the factors that determine the profitability of Spanish banks for the period 1999 to 2009. He applied the system _GMM estimator to a large sample of Spanish banks. He found that high profitability in banks was associated a large percentage of loans, high proportion of customers deposits, good efficiency and low credit risk. He further observed that higher capital ratios also increase the banks return on assets.

Bouheni (2013) investigated the effect of banking supervision on performance of banking industry. He used the generalized method of moment (GMM) to investigate this relationship using a sample of ten largest European banks in France, Germany, UK and Greece for the period 2005 to 2011. He found that Banking supervision seems to have an impact on banks performance, however the effect is dismissed when introducing other variables capturing macroeconomic, and institutional and financial development indicators.

Hoffmann (2011) used the generalized method of moment (GMM) to examine the determinants of profitability of the US banking industry during the period 1995 to 2007. He combined both bank specific variables and the macroeconomic variables. The results revealed a negative relationship between the capital ratio and profitability. The results similar to what the researcher has found.

Even though in most of these studies, both dependent variable (ROA) and the explanatory variables used are the same as those used in this study, the researcher used different measures of these variables. In addition, the researcher used interest rate sensitive ratio as one of the explanatory variables which has not been used in these studies. For example, Kebede (2014), measured operational efficiency/managerial efficiency and reserve requirement as the ratio of operating expenses to total assets and reserve account to total assets respectively, while the researcher measured managerial efficiency and reserve requirement as non-interest expenses (operating expenses) to total income and available reserve/reserve account to total deposits.

Measures used by the researcher are those recommended by the International Monetary Fund (IMF) and are therefore considered more accurate.

Habtamu (2012) also used different measures from those used in this study to measure capital adequacy ratio and liquidity ratio. He measured capital adequacy ratio and liquidity ratio as gross capital to total assets and total loans to total deposits respectively, while the researcher used total qualifying capital to risk weighted assets for capital adequacy ratio, and liquid assets to total assets for liquidity ratio. These ratios are also recommended by IMF.

Chapter summary

The literature review has provided an overview of the banking sector in Lesotho. The nature of banking business in general and the process of asset/liability management in commercial banks have also been provided in this chapter. The rational for regulating banks, its impact on performance of banks, risk of not regulating banks and different accords that have been introduced by Basel Committee to provide guidance on the regulation of banks around the world have also been clearly articulated in this chapter. The empirical studies revealed that most of the explanatory variables used to explain banks performance have statistically significant impact on the banks performance. The next chapter presents the research methodology used in this study.

3 CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter of the research covers the research methodology used in this study. The chapter is organized as follows. Section 3.2 presents the data and data sources. Section 3.3 discuses the research design and chapter summary concludes the chapter.

3.2 Data and Data Sources

The time series data was used in this research. Brooks (2008) stated that time series data are data that have been collected over a period of time on one or more variables. Time series data was associated with a particular frequency of observation. Secondary data was employed in this study. Secondary data of Lesotho commercial banks audited financial statements and other unpublished documents, was collected from Central Bank of Lesotho, Banking Supervision Department.

In order to carry out any research activity, information should be gathered from proper sources (Habtamu 2012). The study employed secondary data obtained from the Central Bank of Lesotho Supervision Annual Reports and other unpublished documents covering a period of 11 years from January 2005 to December 2015.

The sample consists of four commercial banks licensed and supervised by the Central Bank of Lesotho as the commissioner of Financial Institutions. The banks included in the sample were Standard Lesotho Bank, Nedbank Lesotho, First National Bank Lesotho and Lesotho Postbank.

The data collected was considered valid and reliable as it was collected from the Central Bank of Lesotho's Supervision Department published reports and other unpublished documents. The Central Bank of Lesotho's Banking Supervision Department receives returns from Commercial banks and other licensed institutions, weekly, monthly, quarterly and annually. The department also conducts on-site inspections in order to verify the accuracy of the returns.

3.3 Research design

The ordinary least squares (OLS) regression model was used to investigate the relationship between bank regulation, ALM strategies and performance. The dependent variable is Return on assets (ROA) which is a measure of profitability. ROA is intended to measure how efficient the firm uses its assets and manages its operations (Ross et al 2003). Habtamu (2012) also highlighted that ROA reflects the ability of a bank's management to generate profits from the bank's assets. ROA was calculated as profit for the year to date before tax divided by total assets.

The independent variables are gap ratio (GR), liquidity ratio(LR) and Capital adequacy ratio (CAR), while managerial efficiency ratio (ME), and cash reserve requirements (CRR) are included as control variables.

Model specification

$$ROA\,(Y) = \alpha + B0X0 + B1X1 + B2X2 + B3X3 + B4X4 + E$$

$Y = is\ the\ dependent\ variable\ (Return\ on\ Assets)$

$\alpha = is\ the\ value\ of\ the\ intercept$

$B0, B1, B2, B3\ and\ B4\ are\ the\ regression\ coefficients.$

$X0 = Gap\ Ratio$

$X1 = Liquidity\ Ratio$

$X2 = Capital\ Adequacy\ Ratio$

$X3 = Management\ efficiency\ ratio$

$X4 = Cash\ Reserve\ Requirement\ Ratio$

3.4 Variables description

3.4.1 Dependent variable

Return on assets (ROA) - is used in this study as a measure of bank performance/profitability. It is calculated as the net income before tax divided by average total assets. As highlighted by Habtamu (2012), this ratio is probably the most important in comparing the efficiency and operating performance of banks as it indicates the returns generated from the banks' assets. Below is how the ratio is calculated:

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$$ROA = Net\ income\ before\ tax\ /\ Average\ total\ assets\ (IMF\ 2006)$$

3.4.2 Independent variables

The independent variables are categorized into three groups, ALM strategies variables, regulatory variables and control variables.

3.4.3 AML strategy variables

Gap ratio (GR): one of the important roles played by asset and liability management committee is to forecast interest rate so as to earn more profit. If interest rates are expected to increase in the near future, the bank could decide to have more of rate sensitive assets than rate sensitive liabilities (positive gap, RSA > RSL)). If interest rates are expected to decrease, the bank could decide to have a negative gap (RSA < RSL). This is measured as the rate sensitive assets to rate sensitive liabilities as shown below:

$$GR = RSA\ /\ RSL\ (Cole\ 1996)$$

3.4.4 Regulatory variables

Liquidity ratio (LR)**:** this is a portion of the banks assets that are required to be maintained in liquid form. The Central Bank of Lesotho requires that all banks should maintain liquid assets of not less than twenty five percent of their total liabilities. The researcher expects that LR will have a negative effect on performance as assets maintained in liquid form such as cash normally earn zero interest. LR was measured as follows:

$$LR = liquid\ assets\ /\ total\ assets\ (IMF\ 2006)$$

Capital adequacy ratio (CAR): this is the amount of qualifying capital as a percentage of risk weighted assets, which banks are required to maintain at all times. Qualifying capital is defined as the sum of tier I and Tier II capital as defined by Basel Committee (Risk Based Capital Requirements Regulations 2016) In Lesotho banks are required to maintain not less than eight percent of their risk weighted assets. The researcher expects it to have a negative effect on performance. CAR is measured as follows:

$$CAR = Total\ qualifying\ capital\ /\ Risk\ weighted\ assets\ (IMF\ 2006)$$

3.4.5 Control Variables

Managerial efficiency (ME): this is the measure of how well a bank is managing operating expenses (Kebede 2014). It is measured as non-interest expenses to total income. The higher the ratio the lower the profit, the researcher therefore expects it to have negative effect on performance. ME is measured as follows:

$$ME = Non-interest\ expenses\ /\ total\ income\ (IMF\ 2016)$$

Cash Reserve Requirement (CRR): this is a portion of banks assets that is held with the Central Bank of Lesotho and do not earn any interest. The ratio is measured as available reserves to total deposits and is expected to have a negative effect on banks' performance. CRR was measured as follows:

$$CRR = Available\ reserves / total\ deposits\ (IMF\ 2006)$$

Chapter summary

This chapter provided the methodology used in this research and all the variables including the control variables which are expected to influence banks profitability. The regression model used to analyse this relationship is presented. The next chapter presents the results.

4 CHAPTER FOUR: DATA PRESENTATION AND ANALYSIS /DISCUSSION OF THE RESULTS

This chapter presents the study findings of the effect of asset liability management strategies and regulation on performance of commercial banks in Lesotho between the years 2005 and 2015. The chapter is made up of four sections. Section 4.1 presents the descriptive statistics. Section 4.2 discusses the correlation between variables. Section 4.3 presents the regression results of the factors that influence banks' performance as measured by ROE. The chapter summary concludes the chapter.

4.1 Descriptive statistics

Table1 below present the descriptive statistics of return on assets (ROA), gap ratio (GR), liquidity ratio (LR), management efficiency ratio (ME), capital adequacy ratio (CAR), and cash reserve requirements ratio (CRR).

Table 1: Descriptive Statistics

	ROA	GR	LR	CAR	ME	CRR
Mean	0.0221	1.0426	0.5887	0.1780	0.5115	0.0376
Median	0.0193	1.0418	0.6001	0.1706	0.5088	0.0355
Maximum	0.0454	1.1169	0.8310	0.2944	0.6495	0.0680
Minimum	0.0050	0.9794	0.4146	0.1267	0.3579	0.0194
Std. Dev.	0.0121	0.0332	0.1178	0.0376	0.0739	0.0109
Skewness	0.3716	-0.0153	-0.1980	1.2769	-0.2289	1.1259
Kurtosis	1.8450	2.3930	1.9029	4.4271	1.9579	4.3887
Probability	0.1774	0.7128	0.2873	0.0016	0.3050	0.0016

As indicated from table 1, the average ROA within the period of the study was 2.21% while the median was 1.93%. The maximum ROA was 4.5% while the minimum was 0.0%, while standard deviation was 0.01 and skewness was (0.37) while Kurtosis was 1.84 which is below a normal value of 3indicating that most of the values are closer to the mean; therefore the degree of peakness is normally distributed. Jarque-Bera

statistic is 3.45. This therefore indicates that Return on assets was normally distributed.

Column two of table 1 reveals that the average and median of gap ratio was 104%. The maximum was 1.12 and minimum was 0.98. It has a standard deviation of 0.03. The variable has a negative skewness (-0.02) and Kurtosis of 2.39 which is below the normal value of 3. Jaque-Bera is 0.68 which indicates that the gap ratio is normally distributed.

The third column indicates that the average value of Liquidity ratio within the period of the study was 58.87% and the median 60%. Liquidity ratio was maximum and minimum with the values of 0.83 and 0.41 respectively, while the standard deviation was 0.12. The column further reveals a negative skewness of liquidity ratio of -0.20 and Kurtosis of 1.90 which is below the normal value of 3. Jaque-Bera stands at 2.49. Liquidity ratio is therefore normally distributed.

As revealed by the fourth column, the average value of Capital adequacy ratio was 17.80% while median was 17.06%. The maximum value of Capital adequacy ratio was 0.29 while the minimum was 0.13. It has a standard deviation of 0.04. It revealed a positive skewness of 1.28, Jaque-Bera of 15.69 and Kurtosis of 4.43, which is above the normal value of 3.

4.2 Correlation Matrix

Table 2 below provides the correlation matrix of return on assets (ROA), gap ratio (GR), liquidity ratio (LR), management efficiency ratio (ME), capital adequacy ratio (CAR), and cash reserve ratio (CRR).

Table2: Correlation Matrix

	ROA	GR	LR	ME	CAR	CRR
ROA	1.0000	-0.1576	-0.0316	0.1879	-0.5553	0.0253
		(0.3068)	(0.8387)	(0.2220)	(0.0001)	(0.8704)
GR		1.0000	0.3802	0.5785	0.2648	-0.0016
			(0.0109)	(0.0000)	(0.0820)	(0.9917)
LR			1.0000	0.0962	-0.2622	0.1198
				(0.5344)	(0.0856)	(0.4384)
MER				1.0000	-0.0825	0.0149
					(0.5944)	(0.9237)
CAR					1.0000	-0.0197
						(0.8991)
CRR						1.0000

Table 2 indicate that there was a negative correlation between return on assets and all the three explanatory variable, namely gap ratio, Liquidity ratio, and Capital adequacy ratio), while there was a positive correlation between return on assets and managerial efficiency and cash reserve requirement. Capital adequacy had the highest negative correlation coefficient with return on assets of -0.56 which is statistically significant (0.0001). These indicate that capital adequacy ratio of Lesotho commercial banks, which is measured by total qualifying capital to risk weighted assets, had statistically significant relationship with profitability. This is an indication that the higher capital amounts banks are required to hold, the lower the profits they will yield. All other variables did not have statistically significant relationship with ROA. There was positive correlation between return on assets (ROA) and managerial efficiency and cash reserve requirement.

The table further provides the correlation between the explanatory variables. Gap ratio is highly correlated with liquidity and managerial efficiency as compared to other variables included in this study with the coefficients of 0.38 and 0.58 respectively. The correlations are however not statistically significant. Gap ratio is positively correlated with all other explanatory variables except with cash reserve requirement. It has a

statistically significant relationship with managerial efficiency. Both liquidity and managerial efficiency are positively correlated and also have positive correlations with other explanatory variables except with capital adequacy ratio. Lastly, capital adequacy ratio has a negative relation with cash reserve requirements.

4.3 Relationship between banks' asset and liabilities strategies and performance

4.3.1 Regression diagnostic tests

Autocorrelation was tested using Breusch-Godfrey Serial correlation LM test which is a more general test for autocorrelation up to r^{th} order (kebede 2014). It allows examination of the relationship between the error term and several of its lagged values at the same time (Brooks 2008). Tables 3 below shows that both the p-value of the F-statistic and the observed R squared were not statistically significant and therefore there is no evidence of autocorrelation.

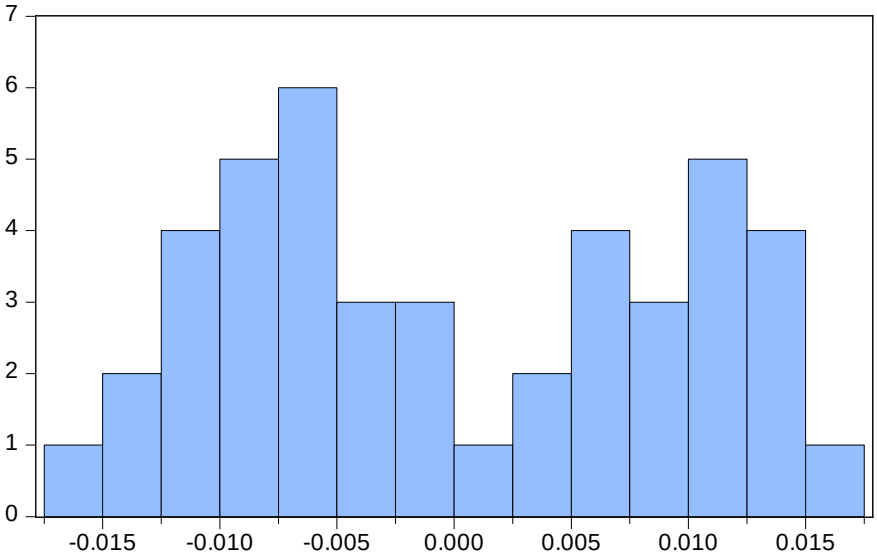
Table 3: Autocorrelation tests

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.742252	Prob. F(2,36)	0.1896
Obs*R-squared	3.882997	Prob. Chi-Square(2)	0.1435

As stated by Kebete (2014), a normal distribution is not skewed and is defined to have a coefficient of Kurtosis of 3. Skewness measures the extent to which a distribution is not symmetric about its mean value while Kurtosis measures how far the tails of a distribution are (Brooks 2008). The Jarque-Bera probability statistic (p-value) is also expected not to be significant even at 10% (Kebete 2014). The normality test shows that the coefficient of Kurtosis is less than 3, (1.71), and the Jarque Bera statistic is not

significant even at 10% level of significance (P-value = 0.21). The conclusion is therefore that the data is normally distributed.

Table 4: Normality test



Series: Residuals	
Sample 2005Q1 2015Q4	
Observations 44	
Mean	-7.89e-19
Median	-0.001483
Maximum	0.017293
Minimum	-0.017214
Std. Dev.	0.009650
Skewness	0.081516
Kurtosis	1.709180
Jarque-Bera	3.103458
Probability	0.211881

The ARCH test was used to test for heteroskasticity. The null hypothesis is that there is evidence of heteroskasticity. Table 5 below shows that the F-Statistic and the Chi-square give the same results which are not significant even at 90% level of significance, an indication that there is no evidence of heteroskasticity.

Table 5: Heteroskasticity test

Heteroskedasticity Test: ARCH			
F-statistic	1.962602	Prob. F(2,39)	0.1541
Obs*R-squared	3.840601	Prob. Chi-Square(2)	0.1466

However, the correlation matrix in table 2 shows that there is high correlation between the two explanatory variables namely gap ratio and managerial efficiency which is statistically significant (P-value 0.0000).

As highlighted by Brooks (2008), a number of alternative solutions have been proposed to solve for multicollinearity in data. The researcher can ignore it, drop one of the collinear variables, or transform the highly correlated variables into a ratio, among others. Because of the theoretical argument of having managerial efficiency as another determinant of banks' profitability and also the fact that gap ratio has been used as the only proxy for ALM strategies, the researcher has decided to include both (collinear variables) but separately in two different models.

4.3.2 Factors that influence banks' ROA

Table 6.1 presents results of return on assets as dependent variable and gap ratio, liquidity ratio, capital adequacy ratio and cash requirement ratio as explanatory variables as the first model.

The second model results are presented on table 6.2 with return on assets as dependent variable and liquidity ratio, managerial efficiency, capital adequacy ratio, and cash reserve requirements as explanatory variables.

Table 6.1: Factors that influence banks performance

Variables	Coefficient	Std. Error	t-Statistic	Prob.
Constant	0.0314	0.0524	0.5997	0.5522
CAR	-0.2093	0.0473	-4.4246	0.0001*
LR	-0.0255	0.0159	-1.6086	0.1158
GR	0.0395	0.0559	0.7071	0.4837
CRR	0.0474	0.1456	0.3260	0.7462

R^2 = 0.3517

Adj. R^2 = 0.2852

F-statistic = 5.2888 Prob(F-statistic) = 0.0017

Durbin – Watson stat = 1.6285

Observations = 44

Table 6.2: Factors that influence banks performance

Variables	Coefficient	Std. Error	t-Statistic	Prob.
Constant	0.0542	0.0169	3.2023	0.0027
CAR	-0.1925	0.0427	-4.5090	0.0001*
LR	-0.0214	0.0137	-1.5561	0.1278
ME	0.0260	0.0210	1.2342	0.2245
CRR	0.0404	0.1434	0.2814	0.7799

R^2 = 0.3680

Adj. R^2 = 0.3032

F-statistic = 5.6784 Prob(F-statistic) = 0.0011

Durbin – Watson stat = 1.5905

Observations = 44

Both table 6.1 and 6.2 above show that regulatory variables (LR and CAR) have negative impact on firm performance and CAR is actually negatively significant. These results imply that the country's regulatory requirements negatively impact on firm performance. Thus, the more capital, the banks are required to hold, the lesser there profitability they will make. The AML variable in table 6.1 does positively impact banks' performance but not significantly so.

The R^2, which is a measure of how well the regression model actually fits the data (Brooks 2008) is 35% and 37% on table 6.1 and 6.2 respectively, an indication that only 35% and 37% of variation in the dependent variable (Return on assets) is

explained by the two models. As indicated by Brooks (2008), the correlation coefficient (R^2) must lie between 0 and 1, and if it is high, that is close to one, the model fits data well and if is low, close to zero, the model is not providing a good fit to the data. Though our R^2 are low, the F-statistics are 5.288 and 5.6784 with the p-values of 0.0017 and 0.0011 respectively which are statistically significant. This is an indication that the explanatory variables collectively support the models. Durbin-Watson, which is a test for first order autocorrelation (Brooks 2008), are 1.63 and 1.59 in model one and two respectively, close to 2, an indication that there is no evidence of autocorrelation.

Chapter summary

This chapter has presented the descriptive statistics of the dependent and the independent variables. It further provided the correlation matrix between the variables, tests of linear regression model assumptions, and the regression results. The next chapter discusses and concludes the thesis.

5 CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The findings of this study are discussed in this chapter. The chapter is organized as follows; section 5.2 discusses the research findings, 5.3 conclude the paper, while section 5.4 provides recommendations.

5.2 Discussion

The findings in this study show that, one of the regulatory variables (CAR) has a negative and statistically significant influence on banks' performance measured by ROA. Another regulatory variable (LR) has negative but statistically insignificant influence on banks performance. Results for banks' AML strategies variable show a positive but statistically insignificant influence on banks performance while both the control variables ME and CRR show a positive but statistically insignificant influence on banks performance.

The results corroborate the findings of Landskroner and Paroush (2011) that high level of liquidity a bank holds, that is a bank's holding of a stock of high quality liquid assets (liquidity warehouse), indicates a capacity to meet liquidity needs and take advantage of business opportunities. However, such assets are generally associated with lower returns; thus, too much liquidity will reduce profitability. The results also corresponds and consistent with the findings reported by Habtamu (2012), and Thornton and Philip (1992). However contradicts findings of Boadi (2015) and Kosmidou (2008), who found that commercial banks profitability responds positively to changes in the banks' liquidity positions. In the case of Kosmidou (2008), contradiction may be brought by the fact that he used a measure of Liquidity ratio different from what the researcher has used. He used liquid assets to customer and short term funding, while the researcher used liquid assets to total assets. The different results therefore need further research.

Capital adequacy ratio has a negative and statistically significant influence on banks performance. This indicates that holding of high levels of capital will have a negative

effect on banks' profitability. So with all other factors held constant, an increase in capital held by banks will lead to a decrease in banks profitability as money that has been held as capital, could have been used to invest in assets and generate income for the banks. The study however contradicts findings of Kosmidou (2008) and Alkassim (2005), who found a positive and significant impact of capital on ROA. This contradiction might be explained by the fact that though both researchers still used capital adequacy ratio as one of the proxies of regulatory variables, they calculated the ratio as equity to total assets while the researcher used the International Monetary Fund (IMF) calculation of total qualifying capital to risk weighted assets.

None of the researchers used gap ratio as an explanatory variable in explaining variation in ROA.

5.3 Conclusion and further research

The main objective of this paper was to assess and evaluate the effect of asset liability management strategies and regulation on performance of commercial banks in Lesotho. Data from 2005 to 2015 of four commercial banks licensed by the Central bank of Lesotho was analyzed. It was presented using descriptive statistics. Correlation matrix and regression analysis were also conducted. Before the regression analysis was conducted, the model was tested for, autocorrelation, homoscedasticity, multicollinearity, and normality. The model passed all except for multicollinearity. To correct for this, the researcher included the collinear variables in two separate models. From the discussion of the results, the conclusion was made that asset liability management strategies variable seem to have no impact on banks' performance while one of the regulatory variables has a negative and statistically significant impact on banks performance. . This is an indication that ALM does not influence banks performance while regulation has an influence on banks performance.

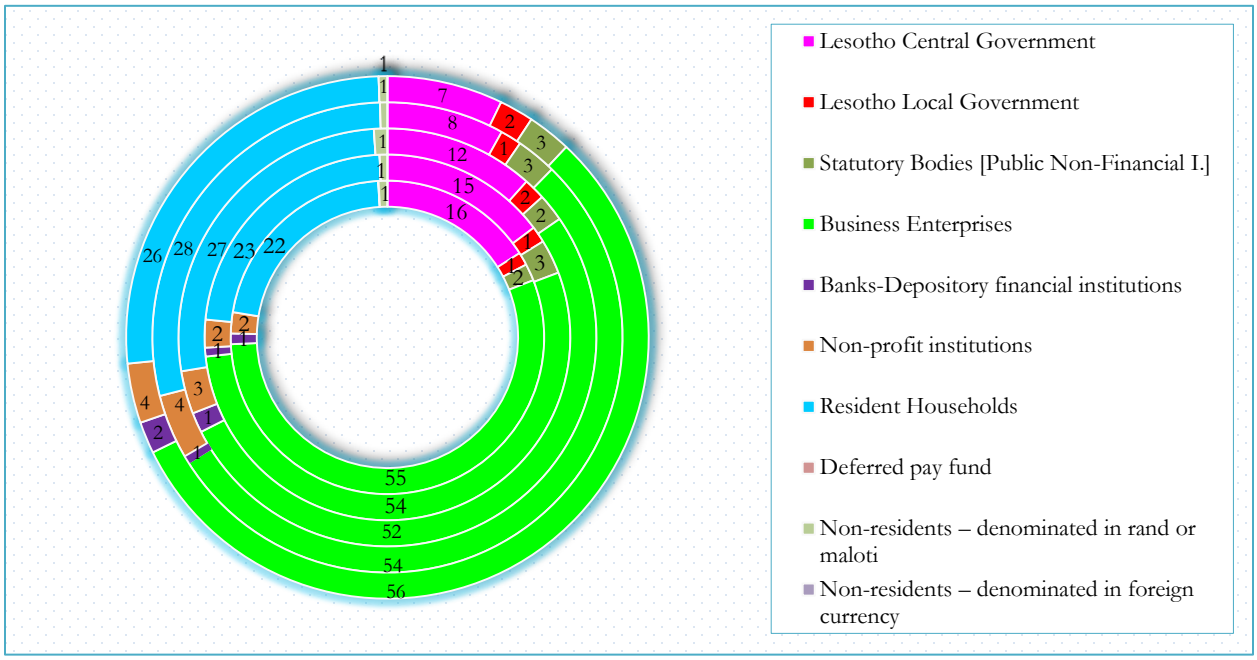
5.4 Recommendations

Based on the findings of the research, and the conclusions made, the researcher recommends that in Lesotho, commercial banks can achieve higher levels of profitability if they can improve on their assets liability management strategies and hold appropriate

mix of assets and liabilities. Regular review of asset liability management policies and tools should be done by the banks board of directors to ensure that they are in line with market developments in Asset liability management process. On the regulatory side, as indicated by the results that holding of too much capital lead to lower profitability, the Central Bank of Lesotho should take this into consideration when developing regulations which require banks to hold a certain amount of capital.

This study used only three variables to investigate the determinants of commercial banks profitability in Lesotho. More research could be conducted using other variables other than the ones used in this study.

Figure:1



The innermost doughnut corresponds with June 2015

6 REFERENCES

Abdullah, N. (2015). Factors that affect the net profit margin of commercial banks in Malaysia. Bachelor of Business Administration with Honours (Finance) Thesis. University Teknologi Mara.

Alkassim, F. (2005). The profitability of Islamic and Conventional Banking in GCC Countries: A comparative study. Retrieved from blog.uny.ac.id/.../Profitability_Islamic_and-Conventional-Banking.pdf

Anjili, AD. (2014). Effects of Asset and Liability management on the financial performance of commercial banks in Kenya. Degree of masters of Science in finance thesis. University of Nairobi.

An Oracle White Paper. (2008). Asset Liability Management Overview, Oracle Corporation, Redwood Shores, USA.

Athanasoglou, P., Brissimis, N. and Delis, D. (2005). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. Bank of Greece W/P. No.25.

Balin, J. (2008). Basel I, Basel II, and Emerging Markets: A Nontechinical Analysis. Johns Hopkins University School of Advanced International Studies (SAIS), Washighton DC.

Banking Supervision Division. (2016). Quarterly Banking Sector Review, Central Bank of Lesotho.

BCBS (2015). 'A Brief History of the Basel Committee' Bank for International Settlements, Basel Committee on Banking Supervision.

BCBS (2011). Basel III: A Global regulatory framework for more resilient banks and banking system, Bank for International Settlement, Basel Committee on Banking Supervision.

Beau, E., Hill, J., Husain, T. and Nixon, D. (2014). Bank funding costs: what are they?, what determines them and why do they matter?. Bank of England quarterly bulletin, Vol. 54, No 4, page 370 – 384.

Bhatia, P. and Mehta, P. (2015). Basel III Accord and its implications on Indian Banking: An Evaluation. International Journal of Engineering Technology, Management and Applied Sciences, Vol. 3. No 3.

Boadi, I. (2015). Profitability Determinants of the Ghanaian Banking Sector in Ongoing Wave of Consolidation. International Journal of Business and Management,Vol. 10. No.12.

Bonn. (2005). An increasing role for competition in the regulation of banks. International competition network antitrust enforcement in regulated sectors subgroup 1.

Bouheni, F. (2013). The effects of supervision on banking performance: European evidence. International conference Governance and Control in Finance & Banking: A new paradigm for risk & performance, Paris France.

Brooks, C. (2008). Introductory Econometrics for Finance, 2nd edition. New York: CAMBRIDGE University press.

Central Bank of Lesotho, Supervision Department Annual Report, (2014).

Charumathi, B. (2008). Asset Liability Management in Indian Banking Industry – with specific reference to interest rate risk management in ICICI bank, Proceedings of the world congress on engineering Vol II.

Chaturvedi, V. (2014). Asset Liability Management in Banks. International Journal of Engineering Technology, Management and Applied Sciences. 1, 2349 – 4476.

Christiansen, J. (2012). New Financial Regulatory Standards (Basel III) and its implication for the European Banking Sector. Master Thesis. Copenhagen Business School.

Claessens, S. (2009). Competition in the Financial Sector: Overview of Competition Policies. IMF Working Paper, WP/09/45.

Cole, C., Featherstone, A. and Albright, M. (1996). Asset/Liability Management in Kansas banks. A Research Report, Kansas State University.

Dionne, G. (2003). The Foundation of Banks Risk Regulation: A review of the literature.

Dodge, D. (2005). Financial system efficiency – getting the regulatory framework right. Speech delivered to the Toronto CFA Society, Toronto, 22 September 2005.

European Central Bank (2009), EU Banks' Funding Structure and Policies.

Farag, M., Harland, D. and Nixon, D. (2013). Bank capital and liquidity. Bank of England quarterly bulletin, Vol. 53. No 3, page 201 – 215.

Faris, N. A. (2010). 'Impact of bank asset and liability management on profitability: Empirical investigation', Journal of Applied Research in Finance. volume II Issue 2(4).

Guthua. A. M. (2013). The effect of Asset Liability Management on the Liquidity Risk of Commercial Banks in Kenya, research report, University of Nairobi.

Habtamu, N. A. (2012). Determinants of bank profitability: An empirical study on Ethiopian Private Commercial Banks, research report, Addis Ababa University.

Heimler, A. (2006). Competition Policy, Antitrust enforcement and banking: some recent developments. Italian Competition Authority, Roma, Italy.

Hillier, D., Ross, S., Westerfield, R., Jaffe, J. and Jordan, B. (2013). Corporate Finance (2nd European Ed.).London: McGraw-Hill Educations Publications.

Hoffmann, P. (2011). Determinants of the US Banking Industry. International Journal of Business and Social Science, Vol 2, issue no. 22, pp. 255-269.

IMF. (2006). Financial Soundness Indicators, compilation guide, Publication services, Washington DC, U.S.A.

Jefferis, K and Manje, L. (2014). Demand, Supply, Policy and Regulations - Lesotho Synthesis report, Making Acess Possible, Finmark Trust.

Kale, S., Eken, M. and Selimler, H. (2015). The Effects of Regulations on the performance of banks: Evidence from the Turkish Banking Industry. Kirklareli University, School of Applied Sciences, Kirklareli, Turkey.

Kebede, E. (2014). The Impact of National Bank Regulation on Banks Performance: Evidence from the private banks of Ethiopia. Master of Business Administration in Finance Thesis, Addis Ababa University.

Kosmidou, K., Tanna, S. and Pasiouras, F. (2008). Determinants of profitability of domestic UK Commercial banks: Evidence from the period 1995 – 2002. Retrieved from https://curve.coventry.ac.uk/.../Determinants+of+profitability.pdf

Landskroner, Y and Paroush, J. (2011). Liquidity Risk Management, structures, and competition in banking. The Capco Institute Journal of Financial Transformation, 33, 113-115.

Lavine, R. (2004). Finance and Growth: Theory and Evidence. National Bureau of Economic Research, working paper 10766.

Mahomed, A. (2013). Evaluating the profitability in Commercial Bank Comparative Study on Indian and Jordan banks. Asian Journal of Finance and Accounting, Vol. 5. No.1.

Makau and Memba. (2014). Influence of Asset Liability Management on Financial Performance of Commercial Banks in Kenya: A case study of Diamond Trust Bank. International Journal of Economics, Commerce and Management, ISSN 2348 0386. UK.

Makhetha, L. and Sebolelo, P. (2015). Problems and Prospects of SMES Loan Management: Case of Lesotho. International Journal of recent Research in Interdisciplinary Sciences (URRIS). Vol. 2,Issue No. 1.Molyneux, P. and Thornton, J. (1992). Determinants of European Bank Profitability: A Note. Journal of Banking and Finance, 16(1992), 1173-1178. Retrieved at: https://eclass.teicrete.gr/.../Banks%20Profitability/Molyneux_Thornton_1992. pdf

Marques, M. and Oppers, S. (2014). Risk Taking by Banks: The Role of Governance and Executive pay. International Monetary Fund.

Maruping, A. (1989). Some thoughts on some options open to Lesotho in the tationalisation of the financial infrastructure and its function, Central Bank of Lesotho Occasional paper no. 3.

Mohapi, PL and Motelle, SI. (2006). The Finance Growth Nexus in Lesotho Causality Revelations from alternative proxies, A paper prepared for the 11th African Economic Society Conference, 5 – 7 July, Dakar Senegal

Motelle, SI. (2011). The role of remittances in financial development in Lesotho: Evidence from alternative measures of financial development. Journal of development and Agricultural Economics. Vol 3(6). Pp. 241 – 251.

Njogo, B., Ohiaeri, N. and Omisakin, J. (2014). 'A panel data analysis of asset and liability management on performance of some Nigerian commercial banks'. Research Journal of Finance. ISSN???? 2348-0963.

Odhiambo, N.M. (2010). "Bank Based Financial Deepening and Economic Development in Lesotho: A Multivariate Simulation"

Owoputi, J., Kayode, O. and Adeyefa, F. (2014). Bank specific, industry specific and macroeconomic determinants of bank profitability in Nigeria. European Scientific Journal, Vol 10. No.25, 408-423.

Ozsoy, I., and Sayfullin, S. (2006). Banking: Past and Present. IBSU International Refereed Multi-disciplinary Scientific Journal, No 1.

Ponce, A. (2012). What determines the profitability of bank? Evidence from Spain. Afaanz Accounting and Finance Journal, Vol 53. No.2.

Prathap B. N.(2013). An empirical study of asset liability management by Indian banks, Asia Pacific Journal of Research, ISSN-2320 – 5504

Risk-Based Capital Requirements Regulations (2016). Lesotho Government Gazette, Vol. 61, No.49.

Risk Management Guidelines for Financial Institutions – Supervision of financial institutions (2009). Central Bank of Lesotho Guidelines.

Ronald, J. (2013). The evolution of Asset/Liability Management (a summary). The Research Foundation of CFA Institute.

Ross, A., Westerfield, W. and Jordan, D. (2003). Fundamentals of Corporate Finance (5th Edition). New York: McGraw-Hill Inch.

Said, M.R and Tumin, M.H. (2011). Performance and Financial Ratios of Commercial Banks in Malaysia and China, International Review of Business Research Papers Vol. 7. No. 2. Pp. 157 – 169.

Saunders, A. and Cornett, M. (2008). Financial Institutions Management: A Risk Management Approach. (6th Edition). New York: McGraw-Hill inch.

Sayeed, M., Edirisuriya, P. and Hogue M. (2012). Banks profitability: The case of Bangladesh. International Journal of Business Research Papers, Vol. 8. No.4, Pp 157 – 176.

Seliane, N. and Sello, M. (2015). The Architecture of the Basel Accords: Perspective on evolution and adoption in the context for Lesotho. W/P No. WP01/15.

Sheela, P. (2014). Effect of Asset-Liability Management on Commercial Banks Profitability in Indian Financial Market – A case study of two public sector banks, Research Paper, GITAM Institute of Management – GITAM University.

Somashekar, T. (2009). Banking. New Delhi: New Age International Limited.

Spong, K.(2000). Banking Regulation, its purpose, implementation and effects (5th Ed). Public Affairs Department, Federal Reserve Bank of Kansas City.

Swamy, V. (2012). Basel III: Implications for Indian Banking.

Sunny O. (2013). The impact of liquidity management on the profitability of banks in Nigeria, Journal of Finance and Bank Management, pp 37-48.

Supervision Annual Report (2014). Central Bank of Lesotho.

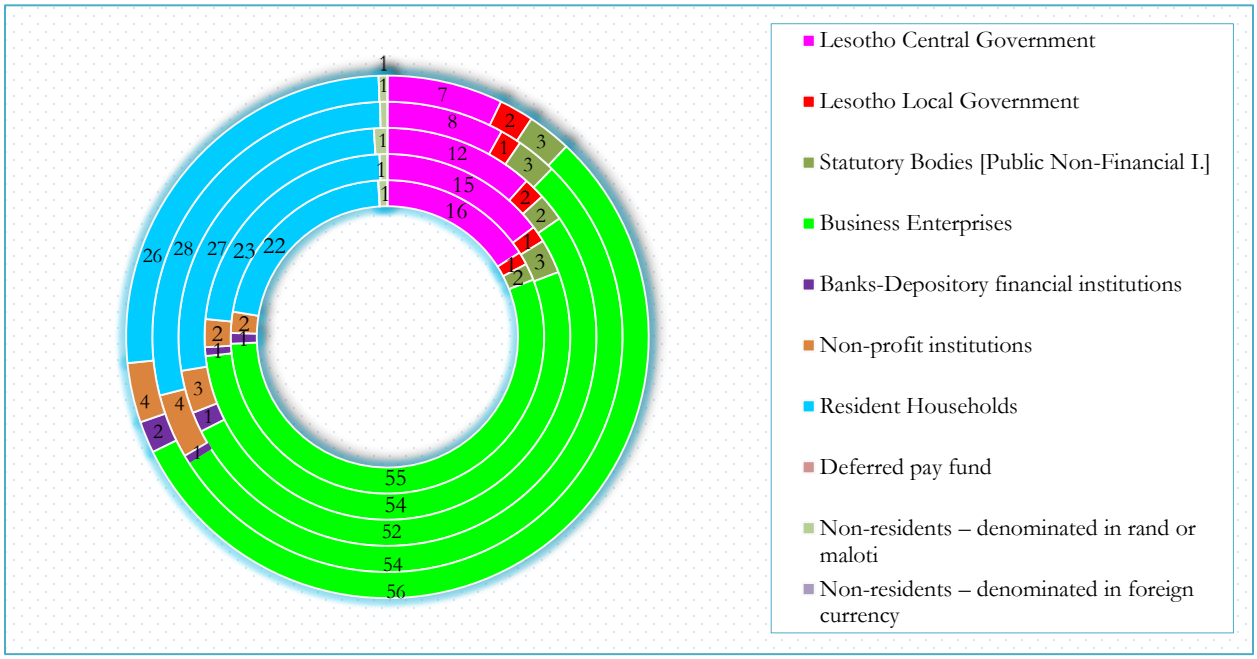
Tamiru. B. (2013). Asset Liability Management and Commercial Banks Profitability in Ethiopia, Research Journal of Finance and Accounting, ISSN 2222-1697, vol, 4, no, 10.

Thamae, M. (2014). Excess Liquidity in the Financial Sector of Lesotho: Main Drivers and Policy Options. Master's Thesis. Wits Business School, University of Witwatersrand.

Thornton, J. and Philip, M. (1992). Determinants of European bank profitability. A note. Journal of Banking and Finance (16), 1173 – 1178, North-Holland.

Vianney, K. (2013). The relationship between regulation and financial performance of Rwanda Commercial Banks. Masters' Thesis. University of Nairobi.

Appendix:1



The innermost doughnut corresponds with June 2015

Appendix: 2

Dependent Variable: ROA
Method: Least Squares
Date: 06/16/17 Time: 18:45
Sample: 2005Q1 2015Q4
Included observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.031421	0.052397	0.599683	0.5522
GR	0.039548	0.055928	0.707133	0.4837
LR	-0.025526	0.015868	-1.608603	0.1158
CAR	-0.209304	0.047305	-4.424564	0.0001
CRR	0.047452	0.145565	0.325985	0.7462

R-squared	0.351678	Mean dependent var	0.022149
Adjusted R-squared	0.285184	S.D. dependent var	0.012143
S.E. of regression	0.010266	Akaike info criterion	-6.213217
Sum squared resid	0.004111	Schwarz criterion	-6.010468
Log likelihood	141.6908	Hannan-Quinn criter.	-6.138028
F-statistic	5.288830	Durbin-Watson stat	1.628452
Prob(F-statistic)	0.001680		

Appendix: 3

Dependent Variable: ROA
Method: Least Squares
Date: 06/16/17 Time: 18:47
Sample: 2005Q1 2015Q4
Included observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.054192	0.016923	3.202338	0.0027
LR	-0.021367	0.013731	-1.556145	0.1278
MER	0.025969	0.021042	1.234170	0.2245
CAR	-0.192460	0.042684	-4.508984	0.0001
CRR	0.040367	0.143443	0.281416	0.7799

R-squared	0.368047	Mean dependent var	0.022149
Adjusted R-squared	0.303232	S.D. dependent var	0.012143
S.E. of regression	0.010136	Akaike info criterion	-6.238790
Sum squared resid	0.004007	Schwarz criterion	-6.036041
Log likelihood	142.2534	Hannan-Quinn criter.	-6.163601
F-statistic	5.678370	Durbin-Watson stat	1.590492
Prob(F-statistic)	0.001062		

Appendix: 4

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.742252	Prob. F(2,36)	0.1896
Obs*R-squared	3.882997	Prob. Chi-Square(2)	0.1435

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 03/18/17 Time: 10:31

Sample: 2005Q1 2015Q4

Included observations: 44

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.016314	0.060765	0.268476	0.7899
IRSR	-0.021991	0.075249	-0.292243	0.7718
LR	0.001691	0.016535	0.102249	0.9191
CAR	0.010338	0.055314	0.186893	0.8528
MER	0.008866	0.028732	0.308582	0.7594
CRR	-0.018289	0.143396	-0.127541	0.8992
RESID(-1)	0.253467	0.176419	1.436732	0.1594
RESID(-2)	-0.256609	0.184192	-1.393159	0.1721

R-squared	0.088250	Mean dependent var	-7.89E-19
Adjusted R-squared	-0.089035	S.D. dependent var	0.009650
S.E. of regression	0.010070	Akaike info criterion	-6.195448
Sum squared resid	0.003651	Schwarz criterion	-5.871050
Log likelihood	144.2999	Hannan-Quinn criter.	-6.075146
F-statistic	0.497786	Durbin-Watson stat	1.965997
Prob(F-statistic)	0.829826		

Appendix: 5

Heteroskedasticity Test: ARCH

F-statistic	1.962602	Prob. F(2,39)	0.1541
Obs*R-squared	3.840601	Prob. Chi-Square(2)	0.1466

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 03/18/17 Time: 10:42
Sample (adjusted): 2005Q3 2015Q4
Included observations: 42 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.85E-05	2.20E-05	4.480425	0.0001
RESID^2(-1)	0.188771	0.158359	1.192040	0.2404
RESID^2(-2)	-0.271948	0.158467	-1.716116	0.0941

R-squared	0.091443	Mean dependent var	9.18E-05
Adjusted R-squared	0.044850	S.D. dependent var	7.88E-05
S.E. of regression	7.70E-05	Akaike info criterion	-16.03570
Sum squared resid	2.31E-07	Schwarz criterion	-15.91158
Log likelihood	339.7496	Hannan-Quinn criter.	-15.99020
F-statistic	1.962602	Durbin-Watson stat	2.002578
Prob(F-statistic)	0.154123		