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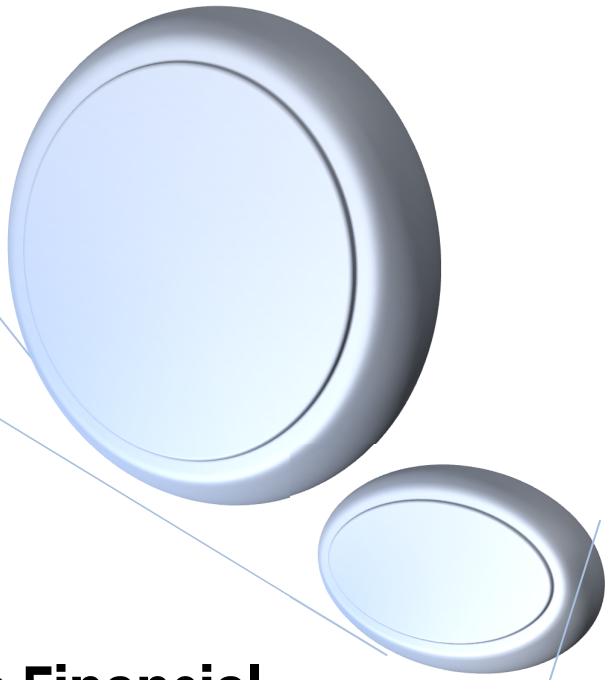

Excess Liquidity in the Financial Sector of Lesotho: Main Drivers and Policy Options

By

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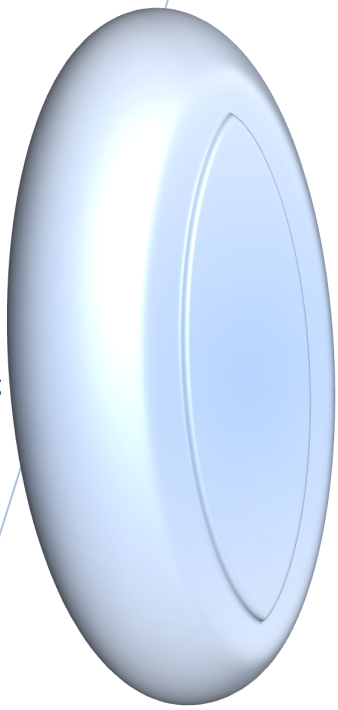

Master of Management in Finance and Investment

Supervisor: Professor Kalu Ojah

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DECLARATION

I, Matsabisa Thamae, hereby declare that the work presented herein is genuine work done originally by me and has not been published or submitted elsewhere for the requirement for a Master in Management of Finance and Investment degree at the Wits business school (WBS). Any literature, data, or works done by others and cited within this report has been given due acknowledgement and listed in the reference section. I further declare that I was given authorization by a panel from the research committee of the WBS to carry out this research.

Signed:

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ABSTRACT

This study investigates the main drivers of excess liquidity in the financial sector of Lesotho using Vector Auto Regression (VAR) analysis. The study also undertakes a comparative analysis of Lesotho and CMA economies for economic and financial sector characteristics to benchmark and assist policy recommendation. The results of the study suggest that excess liquidity in Lesotho's financial sector is driven by undeveloped financial sector as reflected by significant private sector credit to GDP ratio in the results, government expenditure and central bank activities in the open market operations, together with past levels of excess liquidity in the model. Compared to CMA, financial intermediary in Lesotho is relatively undeveloped with government dominating economic activity. The banking sector is observed to be non-competitive for deposits as hinted by the wide intermediation margin compared to other CMA countries.

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I pass my special word of thanks to my employer, the Central Bank of Lesotho for the support, both financially and emotionally, which made it possible for me to undertake the Master in Management programme and this thesis towards the fulfilment of the programme.

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Contents

DECLARATION 1
ABSTRACT 2
ACKNOWLEDGEMENTS 3
CHAPTER ONE: INTRODUCTION 6
1.1 Background 6
1.2 Brief Stylised Facts 7
1.3 Statement of the Problem 8
1.4 Objectives of the Study 8
1.5 Research Questions 8
1.6 Significance of the Study 9
1.7 Study Outline 9
CHAPTER TWO: LITERATURE REVIEW 10
2.1 Introduction 10
2.2 The Structure of Lesotho's Financial System 10
2.3 Theoretical and Empirical Background 11
2.3.1 Nature of Banking 11
2.3.2 Concept of Liquidity 12
2.3.3 Rational for Liquidity 12
2.3.4 Literature Review 13
2.4 Conclusion and Synthesis of Literature Review 17
CHAPTER THREE: RESEACH METHODOLOGY 18
3.1 Introduction 18
3.2 Econometric Model 18
3.3 Comparative Approach 20
3.4 Data and Data Sources 21
3.4.1 Variables and Measurement 21
3.4.2 Data Sources 23
3.5 Statistical Package 23
3.6 Summary 23
CHAPTER FOUR: EMPIRICAL RESULTS AND ANALYSIS 24
4.1 Introduction 24
4.2 Estimation of Econometric Model 24
4.2.1 Data Analysis and Characteristics 24

4.2.2 Tests for Stationarity 26
4.2.3 Lag Structure of the Model 27
4.2.4 Statistical Results and Interpretation 28
4.2.5 Variance Decomposition Analysis 32
4.3 Comparative Analysis 34
4.3.1 Macroeconomic Characteristics 34
4.3.2 Financial Sector Characteristics 35
CHAPTER FIVE: CONCLUSION AND POLICY RECOMMENDATIONS 37
5.1 Introduction 37
5.2 Discussion on Objectives 37
5.3 Conclusion and Policy Options 38
References 40

CHAPTER ONE: INTRODUCTION

1.1 Background

Central banks and monetary authorities are charged with the responsibility to manage liquidity in their respective jurisdictions for different purposes. While they may have different policy objectives and use different tools in pursuit of their monetary policies, central banks have the supply of money as their ultimate target to influence these objectives. The Central Bank of Lesotho is no exception to this as its objective of price stability is archived through the injection and absorption of liquidity depending on the economic conditions in the economy.

However, there could be persistent excess liquidity in the economy and this may pose some threats and challenges. Although relevant indicators point that there is excess liquidity in the banking sector of Lesotho, there has not been a structured research to understand the drivers of excess liquidity[1]. Excess liquidity has been defined in many academic and professional writings and they all point to money or cash in excess of the required levels. According to Gray (2006) excess liquidity or surplus liquidity is net currency liability of the central bank vis-à-vis the commercial banks, while Saxegaard (2006) defines it as the quantity of reserves deposited with the central bank by depository institutions plus cash in vaults in excess of the required or statutory level. These characteristics are present in Lesotho. Before some liquidity indicators in Lesotho could be looked at, it is important to understand the monetary policy environment within which Lesotho operates.

Lesotho has since been a member of the Common Monetary Area (CMA), starting in 1974. CMA started as the Rand Monetary Area Agreement (RMAA) with Lesotho, Namibia, South Africa, Swaziland and Botswana, which withdrew its membership in 1975. The RMAA agreement was revised in 1986 to establish CMA with the same countries but Botswana. The CMA agreement led to both multilateral and bi-lateral agreements being signed between the CMA countries and South Africa, spelling out movements of funds within the CMA, access to South African financial markets, foreign exchange transactions and compensation payments (Wang et al, 2007). Of particular interest to this paper will be how these stipulations relate to the movements of funds to

[1] Mainly IMF missions that provided technical assistance in managing liquidity in the country have been undertaken in recent times, December 2012, on strengthening liquidity management and enhancing capacity for financial stability analysis and reporting

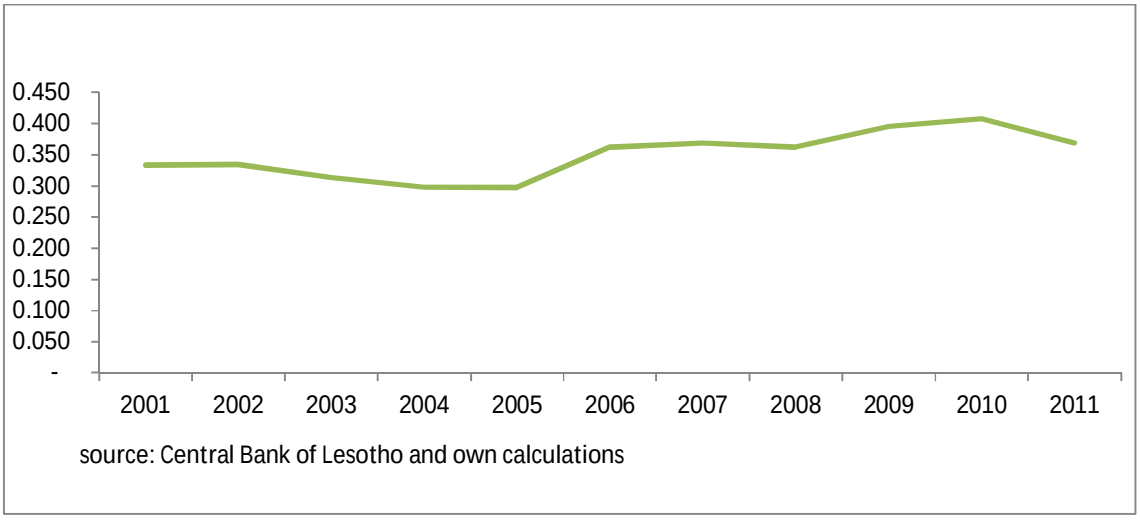
or from Lesotho as a member of CMA, how this influence influence financial environment and its impact on liquidity conditions within the country.

1.2 Brief Stylised Facts

There are different indicators or measures of excess liquidity in theory. Amongst the alternative measures of excess liquidity as Zhang and Pang (2008) shows, the ratio of the broad money aggregate (M2) to nominal GDP remains intuitive and useful indicator of excess liquidity in a country. Another theoretical measure, although difficult to calculate is the monetary overhang. This is defined by Polleit and Gerdesmeier (2005) as the positive deviation of the actual nominal stock of money from the equilibrium stock of money. Excess liquidity is also defined as the excess of banks' reserves over statuary requirements (Khemraj (2007)).

Considering these measures of excess liquidity and the limited domestic channels for investing excess liquidity, commercial banks in Lesotho have increasingly become highly liquid. Chart 1 below shows the trend of the ratio of money supply to nominal GDP for the period 2001-2011. Although liquidity was high around 2001-2002, it declined consistently until 2004 and has increased since then, in line with the increasing concerns that the banking system in Lesotho is becoming overly liquid.

Figure 1. M2/GDP ratio in Lesotho: 2001 - 2011



Although money supply to GDP ratio is intuitive, it is likely to understate the liquidity condition as the money supply measure used does not include rands circulating in Lesotho (CMA common currency), which is difficult to measure because of the free flow of rands between Lesotho and South Africa. If the rand circulation is considered, the picture above would definitely change in

support of increasing liquidity. This study has considered a measure of liquidity that best reflects the situation in Lesotho, taking into account the CMA arrangement in which rands circulate freely and commercial banks can freely invest excess liquid reserves in South Africa.

1.3 Statement of the Problem

Liquidity, although a positive condition in the economy, creates problems when it is in excess of the required levels. Barik et al, (2012) in their study of the impact of excess liquidity on monetary policy indicated that excess liquidity reduces the effectiveness of monetary policy by influencing the demand side and hence stoking inflation. They also pointed out that excess liquidity is costly as central banks would pay interest to the banks for liquidity absorbed through open market operations (OMO). Although the effects of excess liquidity are understood in theory and from empirical studies, sources or drivers of excess liquidity need to be understood in the context of Lesotho's economy as to determine appropriate policy measures that would assist to forestall its occurrence and or persistence. A failure to understand the genesis of excess liquidity in Lesotho would make conventional remedies of excess liquidity less effective.

1.4 Objectives of the Study

The objectives of this study are therefore twofold: to identify major drivers of excess liquidity in Lesotho's banking sector and to analyse their impact and suggest appropriate policy measures for curing or minimising it.

1.5 Research Questions

This study will attempt to provide answers to the following questions:

(i) What is the liquidity condition in the economy of Lesotho?

(ii) What are the main drivers of excess liquidity in Lesotho and how do they impact on liquidity?

(iii) What are the structural differences between Lesotho and CMA countries that could explain the liquidity condition in Lesotho?

(iv) What are the possible corrective policy options available to the Central Bank of Lesotho for addressing excess liquidity problems?

1.6 Significance of the Study

Monetary policy is very significant for the economic management of any country. Because of the immense importance of monetary policy, it is vital that the environment under which it is conducted is understood. By understanding the significant drivers of excess liquidity in Lesotho, the study will yield useful insights into the liquidity forecasting framework of the Central Bank of Lesotho. It will also provide policy options that the Central Bank or the government of Lesotho can follow to alleviate effects of excess liquidity in the economy.

1.7 Study Outline

The remainder of this paper is organised as follow: Chapter two will layout the theoretical and empirical background on excess liquidity; chapter three will develop an econometric model to capture the relationship between significant monetary (economic) variables and excess liquidity. In addition to this, the chapter will spell out a framework to undertake a comparative analysis of the characteristics between Lesotho and the CMA region with respect to their financial systems and economic structures. Empirical results will be derived and analysed in chapter four while chapter five will discuss the study's main findings, policy options and conclusion.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The following section reviews the financial system in Lesotho in order to understand how it is structured, the role players, and Lesotho's demographic and geographical landscape. The section further reviews the theoretical and empirical literature on banking, banks' behaviour and liquidity in financial systems. It concludes with the analysis and synthesis of the reviewed literature.

2.2 The Structure of Lesotho's Financial System

Lesotho's banking sector has evolved slowly since independence in line with most African countries. However, the banking sector underwent significant changes over the past couple of decades. The commercial banking in Lesotho can be traced as far back as 1902 with Standard bank which was joined by Barclays bank in 1957. The two banks were joined by the Lesotho bank in 1972. During that period, the two banks were not playing intermediation role domestically but were collecting deposits to channel into South African economy. The reasons cited for this behaviour were lack of viable projects in Lesotho for bank credit. This led to the government of Lesotho's intervention through the Financial Institutions Act of 1973 which required banks to hold specific amount of assets in the country (Maruping (1989)).

These were followed by many corporatives, credit unions, saving societies, building societies and agricultural development banks, of which many are no longer in existence due to insolvency and administrative issues. In order to provide an oversight to the financial sector, the Monetary Authority was enacted in 1978 and became operational in 1980. The Monetary Authority was given more powers and elevated to the current Central Bank of Lesotho in 1982. Presently, the financial system is dominated by the three South African banks (Standard Bank, Ned Bank and First National Bank) and one government-sponsored post bank (Lesotho Post Bank).

Banking penetration is modest with one bank having a presence in all major towns and in all districts. The banking sector has been growing over the past two decades in terms of penetration while steady in terms of bank assets to GDP ratio. According to Finscope (2011), 68% of the adult population live within 20km of bank branch or Automated Teller Machine (ATM) and more ATM access points and branches continue to be opened. The proportion of the banked population is at 38% with only 19.1% of the adult population financially excluded, despite the majority of the population living in the rural areas. Other than commercial banks, financial services providers

range from insurance companies, micro lenders, non-formal savings societies and corporative societies.

2.3 Theoretical and Empirical Background

2.3.1 Nature of Banking

Excess liquidity has been studied since the beginning of the 19th century and more so over the past decades. Recently, it has become more important following massive injections of liquidity by monetary authorities around the world. Although liquidity is the desired phenomenon, theory stipulates that excess liquidity has adverse effects on the economy. To understand liquidity, it is important to understand the generic nature and behaviour of banks in the financial system, as liquidity in the context of this study focuses on banking system liquidity. Mishkin (1998) notes that banks are intermediary institutions that raise funds from people by accepting deposits, and in turn make loans to people or institutions that have deficit.

Mishkin (1998) shows that principles of bank management are founded on four primary objectives: first, to make sure that they are liquid so that they have enough cash to pay depositors when depositors need money; second, to acquire less risky assets that have low rates of default; third, to acquire funds at low cost and finally, to hold adequate capital. These four elements define the behaviour of banks in their liquidity management and lending activities.

Similar views are also upheld by Blanchard and Johnson (2013) who posit that banks hold reserves for three reasons: as a result of demand for deposits and liabilities against other banks. Furthermore, banks hold reserves as a requirement by the central bank. Through mathematical derivation of the demand for reserves, Blanchard and Johnson (2013) show that the larger the amount of deposits, the larger the amount of reserves banks must hold for both precautionary and regulatory reasons. Jessup (1980) adds that because banks are aware they face a potential deposit outflow at all times, they hold some short-term assets that they can sell quickly at little or no loss to the asset market value to avoid illiquidity.

Due to the critical nature of banks and the business of taking funds from the public, authorities ensure that prudential requirements are placed on banks to prevent adverse results. This behaviour and prudential requirements feed into liquidity nature of the banking sector. The rest of this section focuses on these aspects of banking and their influence on the banks' need to hold liquidity.

2.3.2 Concept of Liquidity

Liquidity has many theoretical definitions and is often used in different contexts. In some contexts liquidity means speed and ease at which assets can be converted into cash (Firer et al, 2009). Liquidity is also defined as a condition in which an asset can be sold quickly without price concession (see Dolvinet (2012)). Agbada and Osuji (2013) offered an exact definition of liquidity in the banking context as the ability of the bank to maintain sufficient funds to pay for its maturing obligations. Although liquidity is a positive phenomenon, it becomes a problem when it is in excessive supply in the financial system. The definitions in the preceding sections provide an intuition for liquidity. However, many studies undertaken on excess liquidity provide an empirical computation of excess liquidity.

In his study of excess liquidity and effectiveness of monetary policy in Sub-Saharan Africa, Saxegaard (2006) equated excess liquidity to the quantity of reserves deposited with central bank by banks plus cash in vaults in excess of the required or statutory levels. He further indicated that excess reserves may be precautionary or involuntary, in which case precautionary excess reserves are held consciously by banks, particularly to meet prudential requirements or to meet liquidity needs while involuntary excess reserves are due to structural impediments in the economic system. Yonghong et al, (2012), in their study of excess liquidity of the open economy and its management, defined excess liquidity as the phenomenon in which the governable currency of an economy is more than it is needed. Gray (2006) explained excess liquidity from the perspective of the central bank in which he indicates that liquidity surplus is the situation where the central bank has net domestic currency liabilities versus commercial banking sector. Although defined from different perspectives or angles, excess liquidity is equated to excess holdings by the banks above the ideal or required levels. The question that remains though is why banks would hold excess reserves. The following section attempts to provide some answers to this question.

2.3.3 Rational for Liquidity

The preceding review offers a solid definition for an understanding of banking system and liquidity. Although the review on banking business may provide a basis or reasons why banks may hold excess liquidity, some studies that were done in other areas of the world provide indications of causes of excess liquidity. However, different economies are individually somewhat unique and what could be the cause of excess liquidity in one economy may not necessarily be the cause of excess liquidity in another. This is the reason why this empirical study

is undertaken for the case of Lesotho. The following paragraphs review relevant theory together with empirical studies to tease out potential causes of excess liquidity in Lesotho.

2.3.4 Literature Review

Mishkin (1998) demonstrates the behaviour of banks during the deposit creation and intermediation process. He shows that for a bank that has no adequate reserves on its asset portfolio, a deposit outflow may lead to the particular bank falling short of its required reserves level. In this case, the bank will be forced to acquire additional funding to meet the shortage by borrowing from the central bank or from other banks. The cost of this activity is the interest rate charged by the central bank on central bank loans or the interbank borrowing rate. This opportunity cost leads to banks providing insurance through excess reserves against deposit outflows. The same view is held by Somashekar (2009), who shows that since banks deal with funds sourced from the public, they should always be on guard by having enough cash to meet the cash demands of the depositors. The cash put aside or liquidity provision acts as the insurance against deposits. The same views are well summarised by Dragos and Ioan (2009) in their study of policies of the commercial banks liquidity management in the crisis context. They posit that inadequate level of liquidity may lead to a need to attract additional sources of funds at higher cost, thereby reducing profitability and could also lead to insolvency. On the other hand excessive liquidity may lead to lower return on funds.

Banks' preference for excess liquidity to guard against deposit protection points to another phenomenon. Depositors withdraw funds for economic purpose. Meirzejewski (2011) indicates that people demand cash holding to execute transactions, to fund potential investment opportunities or to guard against unexpected loss .This is based on Keynesian liquidity preference proposition which states that the sum of cash preference in the economy is dependent on the overall level of transactions. However, the overall level of transactions is difficult to measure but it is proportional to nominal income as Blanchard and Johnson (2013) indicate. This phenomenon is captured by Saxegaard (2006) and Agénor et al, (2004) through a measure of deviation of output from trend. They captured cyclical downturns which would lead banks to anticipate lower transactional demand for money by the public and therefore decrease their holding of excess reserves. The two studies found the cyclicality of output to have a positive impact on excess liquidity.

Studies about reserves accumulations were done as early as the wake of the 19th century, with more interest during the banking crisis of the early 1930s in the United States of America. This

was followed by studies that attempted to model banks' demand for reserves as a cost benefit problem (Frost, 1971; Morrison, 1966; Meigs, 1962, etc). Frost (1971) argued that during that time, reserves accumulation by banks was purely surpluses without economic purpose. The first detailed study was undertaken by Meigs (1962) and followed by Morrison (1966). These studies focused on estimating the demand for banks' excess reserves, with a view that banks accumulated excess reserves passively as monetary base increased in the presence of lack of good loans opportunity.

In his study, Frost (1971) estimated a model for banks' demand for excess reserves based on the inventory management theory, and as a function of interest rates. He found that banks hold excess reserves below a critical interest rate level but reduce their excess reserves beyond a specific threshold that is higher. His study was consistent with the findings of Morrison (1966), although Morrison's model failed to explain accumulation of excess reserves by Canadian banks during 1930s. Khemraj (2006) also confirmed the idea of threshold rate by banks in his study of Guyana, a small open economy, in which he indicated that banks are oligopolistic and consequently desire a minimum loan rate that compensates for the marginal cost of funds before they extend credit to the private sector.

However, the idea of the threshold rate is sharply contrasted by Bird (1989), who observes that banks are assumed to maximise expected profits. In this case, the profit maximisation will not only be affected by the price of the loan (interest on the loan) but also by the probability of realising the expected repayments or probability of the borrower's default. The probability of default changes the idea of the threshold rate since the higher the interest rate on the loan, the higher the probability of default by the borrower. As the rate of interest and the probability of default increase, it is rational for the bank to reduce the supply of loans and hence begin rationing the loans. This is supported by Stiglitz and Weiss (1981) in their credit rationing model in which they conclude that increasing interests rates could increase the riskiness of the bank's loan portfolio, thereby discouraging credit-worthy borrowers but inducing high risk projects by borrowers and therefore reducing the bank's expected profits.

From amongst the recent empirical studies, one of the studies that were undertaken to address similar issues addressed in this paper is that of Aikaeli (2011), who looked at the determinants of excess liquidity in Tanzanian commercial banks. The study found that high cost of funds, deposit volatility and the rate of required reserves perpetuated excess liquidity in Tanzanian banking system. It further found that loan return variation, which was a proxy for credit risk, was significant in explaining excess liquidity in Tanzania. The study employed autoregressive

distributed lag model and the results indicated that all variables were statistically significant and had expected relationship to excess liquidity. The findings also revealed that previous levels of excess reserves were negatively related to current levels of excess liquidity such that banks that held excess reserves previously were inclined to hold less excess reserves in the current period. These results were partly confirmed by Pontes and Murta (2012) in the case of Cape Verde, although thier study used instrumental variables method and investigated different set of variables including government deposits, foreign reserves held by the central bank and government credit. The findings indicated that banks' borrowing rate (cost of illiquidity) was significant in explaining excess liquidity while credit to private sector, required reserves ratio and government deposits were not statistically significant in determining excess liquidity in Cape Verde. The study generalised that precautionary factors are not important in explaining excess liquidity but structural issues such as financial sector development were important.

Another behavioural explanation that points to the cause of excess liquidity holding by banks is found in Bertrand (2001). His study indicated that in the presence of adjustments costs to meet regulatory requirements, banks may not adjust instantaneously to capital requirements should they breach the stipulated levels. In most jurisdictions, if they breach regulatory requirements, banks are subjected to punitive measures by the regulator. As a result, banks will strive to maintain a cushion over required reserves in the form of excess liquidity to reduce the probability of breaching the regulatory requirements. In most regulatory environments, a breach of reserve or capital requirements by the bank is an infringement of the banking law and banks will more likely provide for more than adequate reserves to avoid or minimise the probability of breach. This is supported by Agénor et al, (2004) who found that excess reserves in East Asia were negatively related to the ratio of required reserves although the effect of this was model-dependent. However, this is contrary to Pontes and Murta (2012) in the case of Cape Verde in which required reserves ratio was found to be non-significant in explaining excess reserves as well as Khemraj (2006) in the case of Guyane. The explanation for these findings was that required reserve was constant for most part of the period under study.

Agénor and Aynaoui (2008) analysed a number of factors affecting banks demand for excess liquidity. Although their paper listed a number of factors affecting banks' demand for excess liquidity, they pointed out that factors that lead banks to hold excess liquidity may be classified into structural and cyclical factors, with the degree of financial development identified as the most significant from the structural factors. They posit that in countries with less developed financial system, banks will tend to hold a higher level excess liquidity. This is a prominent factor in low

income countries and is also hinted by Adrianaivo and Yartey (2010) in their study. Although they were not looking at excess liquidity, their study provides insights into banks' role in economic development through credit extension to private sector, which affects liquidity depending on its severity. Under cyclical factors, Agénor and Aynaoui (2008) quoted macro-economic instability, as measured by inflation, to have a positive correlation with excess liquidity. Economic instability negatively affects banking sector growth because inflation volatility reduces bank activities, Adrianaivo and Yartey (2010).

Related to threshold rate and profit maximisation from the supply side, one of the factors cited by Khemraj (2007) that affect banks liquidity position is the risk premium, which is especially prevalent in least developed countries. His paper argued that banks charge minimum interest rate on loans to compensate for the risk of default by borrowers. If borrowers are not willing to pay the risk premium, banks accumulate non-remunerated excess liquidity. This stems from the oligopolistic powers that banks normally possess in setting the borrowing rate in the loan market. Khemraj (2007) shows that to banks, excess liquidity and loans are perfect substitutes. The same view is held by Agénor and Aynaoui (2008) who stated that a higher lending rate may lead to a contraction in the credit demand, which in turn may lead to an involuntary accumulation of excess reserves.

The idea of loan substitutability and the level of loan rate as a compensation to banks is very much related to the marginal loan rate set by banks as an indication of a perception about credit risk since banks that perceive borrowers to have a higher risk of default will likely set a higher marginal loan rate. These views are consistent with Frost (1971) and Morrison (1966) as indicated earlier in modelling excess liquidity demand by banks in which excess reserves is influenced by threshold interest rate, below which banks accumulate excess reserves and above which they deplete excess reserves. This is also supported by Khemraj (2006) in his postulation about risk premia considerations by banks in issuing credit.

The study by Choong and Jayaraman (2012) on implications of excess liquidity in Fiji's banking system investigated the relationship between excess liquidity and loans variability, lending rate, inflation and exchange rate. The study used variance decomposition and impulse response analysis to undertake the investigation. Their study did not explicitly investigate the response of excess liquidity to these variables, but instead the response of these variables to excess liquidity. However, of interest is the finding that there was a negative relationship between excess liquidity and lending rate.

Another important element that was unique to Khemraj (2006) and Pontes and Murta (2012) amongst the reviewed studies and yet intuitive is the central bank interventions in the financial system through open market operations. Khemraj (2006) indicated that if the central bank buys the reserve currency (sells the domestic currency) the result will be a build-up of excess reserves unless there is sufficient sterilization. The two studies found the change in central bank foreign assets to be significant in explaining the level of excess reserves, indicating the success of the central banks in influencing liquidity level in the financial system. Spaanderman (2012) observes that central banks form the centre of liquidity flows by injecting liquidity into the financial system via intraday and open market operations.

2.4 Conclusion and Synthesis of Literature Review

The preceding literature review has provided a background to the financial system in Lesotho for general understanding. The section also provided a clearer picture on the banking business and the environment of its operation. The empirical studies highlighted factors that have been found to have important impact on liquidity in other economies around the world. From these discussions, it is clear that there are different reasons why banks may hold excess liquidity and their importance differ across borders. The review therefore provides a way forward for developing an econometric model for excess liquidity from which a test of pertinent variables will be undertaken and results analysed for policy proposals. For the purpose of this study, the impact of macroeconomic stability, deposit insurance, banking sector development, opportunity cost of funds, business cycle and central bank activities towards monetary operations will be investigated relative to excess liquidity preference by banks.

CHAPTER THREE: RESEACH METHODOLOGY

3.1 Introduction

This chapter specifies a model to be used in the study and variables to be included. From literature review, different studies used different models and included different variables. This section identifies a model and relevant variables to be used as empirical studies and theory have suggested.

3.2 Econometric Model

From the previous chapter, there are a number of studies that have been undertaken with respect to excess liquidity and they are diverse in their objectives. For instance Deléchat et al, (2012), in their paper on the determinants of bank's liquidity buffers in Central America, used OLS estimation techniques to determine the significance of bank ownership structure in determining excess liquidity. Yonghong et al, (2012) used VAR model and impulse response analysis to analyse the impact of global liquidity surge on Brazil, Russia, India, China, South Africa (BRICS) America and Euro zone. Saxegaard (2006) also used the econometric model in which the statutory excess reserves were regressed to vectors of lagged polynomials. Although the objective of Saxegaard (2006) was to study the impact of excess liquidity on the effectiveness of monetary policy, the model also provides insights on the drivers of excess liquidity. He used the methodology adopted by Agénor et al, (2004) but modified it for his objective. Agénor et al, (2004) used a model that was based on the estimation of the demand function for excess liquid assets by commercial banks. In this study, the author has used the Saxegaard (2006) model with customisation to the variables that are unique and deemed important in explaining excess liquidity in Lesotho.

This study will use both econometric techniques and comparative analysis to determine drivers of excess liquidity in Lesotho. The study uses VAR modelling and variance decomposition to study the relationships of variables in the system. Variance decomposition addresses the question such as "what are the sources for a particular phenomenon?" (which is what the study is trying to establish in the context of excess liquidity). Brooks (2008) shows that besides the information of whether the variables are significant or not in explaining the dependent variable, impulse responses trace out the responsiveness of the dependent variables in the VAR to shocks from each of the potential driver variables. While the impulse response function traces the effects of a shock to one endogenous variable on the other variable in the system, variance decomposition attributes

the variation into components of these shocks to the VAR system. The two techniques are complementary to each other but the relevance of variance decomposition in answering the question of "what are the sources of a particular phenomenon" lead to this study employing the technique of variance decomposition to understand the drivers of excess liquidity.

This is an important facility that will inform policy makers of the variables that are most influential in the system in determining excess liquidity since the individual coefficients have no economic interpretation. It is more important and provides more insights than the statistical results of the VAR model (Bernanke and Gertler (1995)).

VAR models have many advantages over uni-variate time series models or simultaneous structural models, some of which are cited by Brooks (2008) as flexibility. The fact that there is no need to distinguish between exogenous and endogenous variables makes it flexible. The model allows the value of the dependent variable to depend on its lagged values, which in this case will capture the notion of liquidity dynamics to assess how previous liquidity levels impact on current liquidity levels. These are important qualities of the VAR technique.

VAR models are not immune to limitations. One of the cited limitations is the fact that VAR models are a-theory models, without economic theory behind them. Another practical challenge highlighted by Gujarati (2004) with VAR models is the determination of the appropriate lag and this becomes severe on limited data samples. This challenge is addressed by the use of Akaike, Schwarz or Hannan-Quinn information criteria to determine the optimal lag length.

Another problem identified by Ikhide and Ebson (2010) in their study of the impact of South African monetary policy on the economies of Common Monetary Authority, is the ordering of variables in the VAR model. They indicated that order may impact on the outcome of VAR model as alternative ordering of variables may impact on the explanatory power of the variables. In their study they used theoretical knowledge to determine the order of explanatory variables but also indicated that the order is not important for high frequency data, which is the case in this study. Ordering was also given significance in Bernanke and Gertler (1995) to reflect the theoretical relationship amongst the investigated variables in the system.

The problem of ordering variables in the VAR model is however not emphasised in many studies that used VAR approach (Saxegaard (2006), Agénor et al, (2004) and Aikaeli (2011)) and in most text books such as Brooks (2008) and Gujarati (2004) in their discussions of the limitations of the VAR methodology. While studying the monetary transmission mechanism in Japan, Morsink and Bayoumi (1999), found that the order of variables did not affect their results. For instance when

they investigated the response of real activity to shocks of prices, overnight rate and broad money, their results were the same when the order was vice versa.

However, given the controversies surrounding ordering of variables in the VAR model, some studies have indicated that the argument of ordering in VAR model is invalid since VAR models are too a-theoretical (Sims (1980)). An attempt is made to order variable according to their priory causal relationships.

While Saxegaard (2006) made a distinction between precautionary and involuntary excess reserves and separated factors that influence excess liquidity in the model, this paper does not make such distinction but rather looks at liquidity in aggregate. Therefore, the following specification is adopted and modified from Saxegaard (2006);

$EL_t = \alpha X_t (L)$

Where EL is excess liquidity,

X is a vector of variables that explain excess liquidity

L is a lag operator

3.3 Comparative Approach

In addition to the econometric analysis, the paper also undertakes a comparative analysis in which the structural characteristics and regulatory framework of Lesotho are compared to CMA countries. While there are three potential economies in the CMA that could be compared to Lesotho, they are diverse, with Swaziland being similar to Lesotho in most aspects and often faced with similar challenges. South Africa on the other hand is relatively more advanced and has greatly varying characteristics that make it incomparable to other CMA countries. Although Namibia shares similar elements with most Sub Saharan African countries, it often faces different challenges compared to Lesotho and Swaziland. Therefore, comparison will be made particularly to Namibia and Swaziland with some reference to South Africa. The structures of these economies will be compared together with their institutional arrangements and features that could explain liquidity conditions in their systems.

The comparison will be on the level of financial depth, financial sector development as proxied by credit to private sector ratio in order to assess how diverse these economies are in terms of financial intermediation as well as the influence of government activities in the economy.

Monetary aggregates together with prudential requirements are also compared across the region for structural differences.

3.4 Data and Data Sources

3.4.1 Variables and Measurement

The econometric specification is general and theoretically there are many variables that could be considered in the study based on theory and empirical evidence. However, one of the serious limitations in any study is data availability. This is more severe in least developed countries and developing countries. This study investigates the impact of the following variables on excess liquidity: deposit variability, private sector development, macroeconomic stability, business cycle, opportunity costs of funds, credit risk perception and the influence of central bank to the banking system through its monetary policy operations. This yields the following specific econometric model;

$$EL_t = \alpha X_t (L) + \mu$$

$$Xt = \{EL_{t-1}^{-}, DEPvol^{+}, LENR^{-}, CREps^{-}, GOVT^{+}, INFL^{+}, TBL^{+/-}, NIR^{-}, Y_D^{+},\}$$

Where the dependent variable is the quantity of excess reserves at a particular time ($EL_{t)}$, measured as the deposits with the central bank plus cash and liquid assets in excess of the required amount. The regressors are the lagged values of excess liquidity (EL_{t-1}) which will capture the influence of past liquidity on current liquidity holding by banks and the dynamics of adjustment. This is expected to be negatively related to current liquidity levels as results of Agénor et al, (2004) and Aikaeli (2011) revealed. Treasury bill (T-bill) captures two elements, the opportunity cost of funds and the cost of illiquidity[2]. The higher the cost of illiquidity, the more fearsome banks become and the tendency to hold excess liquidity; hence, this variable is expected to have a positive relationship to liquidity in this context. In terms of the opportunity cost of funds, the more attractive is the T- bill rate, which is riskless, the more banks are inclined to investing in T-bills, which will affect liquidity negatively as more is absorbed from the circulation. There is conflicting impact of T-bill rate depending on the perspective. The variable

[2] Discount window rate is T-bill rate plus some margin in Lesotho, thereby relating the cost of illiquidity to T-bill market

GOVT is the log of government expenditure and will capture the impact of economic activities of the government which has proved to play a significant role in the economy[3].

In order to assess the impact of business cycles, which Agénor et al, (2004) measured as the deviation of output from trend, a ratio of current output to trend will be used (Y_D). Trend will be measured as a 3-year moving average which is different from Agénor et al, (2004) in which a 5-year moving average is used. This is due to the limitations in data time series. The 3-year period is aligned to the medium term period used in fiscal operations, which has been indicated to account for about 66% of the national output. Because of significant contribution of government expenditure to GDP, GDP behaviour is most likely to be affected by the behaviour of government expenditure. GDP data was originally on quarterly basis and since most of the data is on monthly basis, it was interpolated to monthly frequency. The idea behind output deviation is that a cyclical downturn will lead to banks holding less excess liquidity in anticipation of a lower demand for cash by the public to finance transactional needs while an upswing will mean an increased demand for cash and hence an accumulation of liquidity by the banks to provide for anticipated transactional demand.

Cyclicality is also related to deposit insurance or a need to guard against withdrawals and will be complemented with DEPvol. Deposit volatility is measured in the similar way to Saxegaard (2006) whereby a ration of standard deviation of deposit to a moving average of the deposit is used to measure deposit volatility. However, as opposed to a 5-year moving average used by Saxegaard (2006), a 1-year moving average is used in this paper due to the short term nature of deposit.

Lastly, macroeconomic stability is captured by the variable INFL, which is proxied by inflation while NIR is log of net international reserves held by the central bank to capture the effects of monetary policy operations. CREps represents private sector credit to GDP ratio which measures the impact of financial sector development and R_L is the prime lending rate by commercial banks, which is used to investigate the influence of risk perception by banks on consumers to liquidity preferences. μ is the white noise error term.

All of these variables are on monthly basis and range from January 2003 to March 2013, which yield a sample size of 123 data points. Since GDP is quarterly, for variables that are expressed as

[3] Government expenditure in Lesotho accounts for 66% of the total GDP- Central Bank of Lesotho Economic Outlook Seminar January 2014

a ratio of GDP, quarterly figures of GDP are interpolated to monthly frequency using a statistical package used to run the model.

3.4.2 Data Sources

All the data used in this study is sourced from the Central Bank of Lesotho for an econometric model while for the comparative analysis, the relevant data are sourced from the International Monetary Fund for all CMA countries. Additional data on financial sector is sourced from Finscope studies conducted on the four CMA economies. Central banks maintain monetary and economic data for policy and publications; hence, data from these sources is deemed quite reliable and credible. This is the same with International Monetary Fund and World Bank, which source data from the same institutions and governments for research, policy and publications rendering the data of highest quality.

3.5 Statistical Package

To estimate the results of the model, the study used open source statistical software – Gnu Regression, Econometrics and Time-series Library (Grelt). Gretl is an econometrics package, including a shared library, a command-line client program that has gained popularity and was initially developed by Donald Knuth from Stanford University and enhanced by hundreds of contributors around the world.

3.6 Summary

The preceding chapter has spelled out the specification of the model with variables to be investigated for their impact on excess liquidity and the apriori relationship with excess liquidity. The chapter has laid out the foundation for the next chapter which will estimate the model and undertake the analysis of the results for Lesotho's empirical evidence. It has also set forth a foundational framework for undertaking the comparative analysis of Lesotho versus CMA countries with respect to structural differences.

CHAPTER FOUR: EMPIRICAL RESULTS AND ANALYSIS

4.1 Introduction

This chapter presents the descriptive analysis and characteristics of the data in section 4.2 and estimates the results of prescribed model in section 4.3. These results will be interpreted in section 4.4 while section 4.5 will undertake the comparative analysis. The last section, 4.6 concludes the chapter.

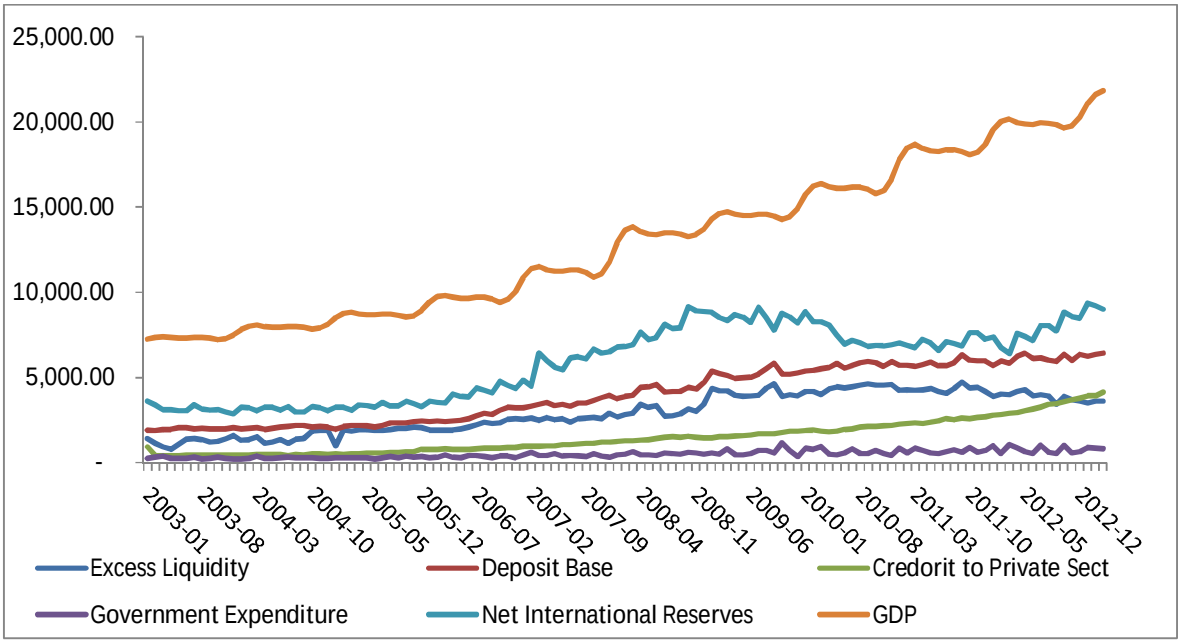
4.2 Estimation of Econometric Model

4.2.1 Data Analysis and Characteristics

This study uses time series data for all of its variables and one of the important characteristics of time series data is stationarity. Non-stationary time series can lead to spurious regressions in which variables may appear to be strongly related while in actual fact they are not; hence, all variables are required to be stationary for proper joint significance tests (Brooks (2008)). A visual plot of the data is usually the first step in the analysis of time series data (Gujarati (2004)).

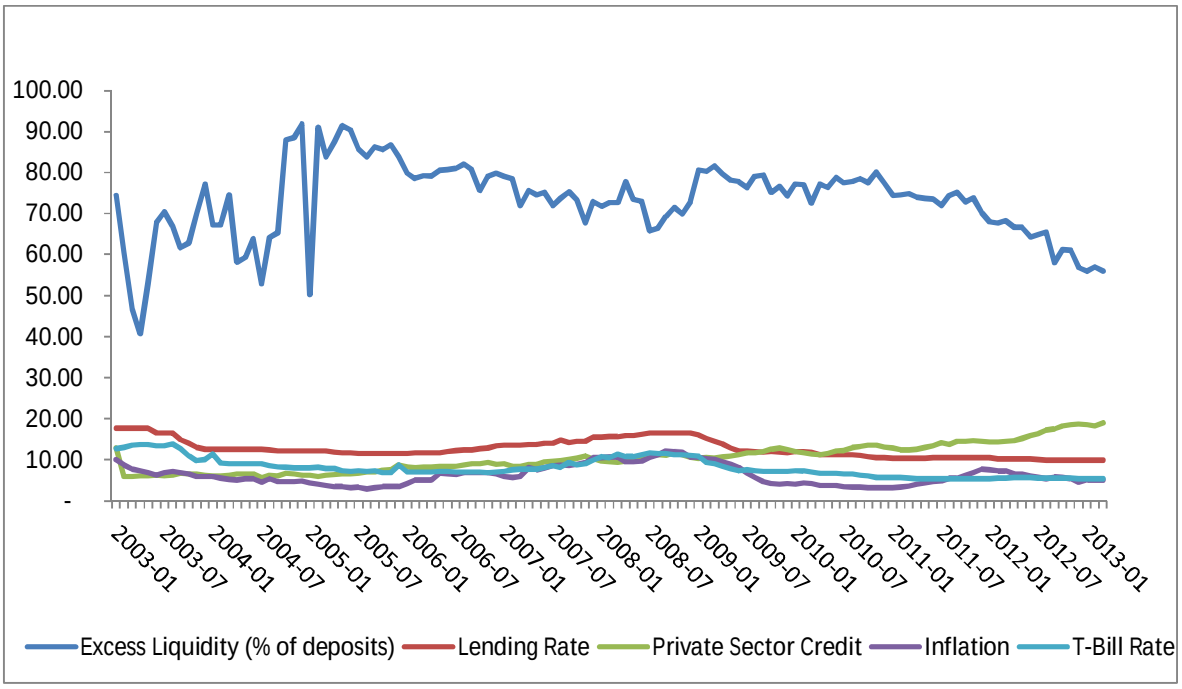
Visualisations of the variables over the sample period on Figure 2 and Figure 3 show how the variables have evolved over time. For homogeneity, Figure 2 plots excess liquidity, deposit base, credit to private sector, government expenditure, net international reserves and GDP in absolute amounts. On the other hand Figure 3 plots excess liquidity as a percentage of deposit base, lending rate, percentage of private sector credit to GDP, inflation rate and the T-bill rate. From Figure 2, most of the variables under study are depicted trending upwards, a phenomena frequent in economic data. Aggregate output as measured by GDP has been growing from levels of around M5 billion from 2003 to the current levels of around M20 billion, although fluctuating with business cycles during the period. Deposit base and credit to private sector have also been steadily growing as depicted by the graph. Foreign reserves held by the Central Bank of Lesotho have been growing significantly as the government experienced surplus and undertook to build up reserves for the future but declined following the 2008 financial crisis before recovering again from 2011onwards on intended replenishments by the Government of Lesotho.

Figure 2. Time series plot of monetary variables used in the study



From Figure 3, excess liquidity as a percentage of deposit is indicated fluctuating variably from 2003 to 2005 after which it declined significantly until end of 2007. During early 2008, liquidity built-up quickly to the beginning of 2009 and this could be explained by the financial crisis of 2009 that saw liquidity surging globally as banks hoarded cash.

Figure 3. Time series plot of percentage variables used in the study



As evident from Figure 3, excess liquidity stabilised between 2010 and 2011 and further declined as confidence was restored in the financial sector and banks began extending credit.

Although liquidity is seen volatile on Figure 3, an interesting trend is with respect to private sector credit. Private sector credit has been consistently trending upwards and more so in 2011 which could be as a result of the structural reforms in the legal sector with respect to commercial court to streamline commercial cases and land tenure system. The three variables, inflation, lending rate and T-bill rate have generally moved together as it is expected since inflation is a component in both the lending rate and the T-bill rate, while on the other hand the T-bill rate provide some benchmark to the lending rate.

4.2.2 Tests for Stationarity

While the visual plot of the variables, especially on the levels, hints the presence of stationarity, formal tests have to be undertaken. However, the foregoing analysis does not use transformed variables as presented in the model. The tests for stationarity will be done on the variables as presented in the methodology as opposed to the levels. For this purpose, all variables to be used in the model are subjected to Augmented Dicky Fuller (ADL) test to diagnose for non-stationarity. Table 1 indicates the test statistics for ADL for both variables at their levels as specified in the model and when transformed through differencing.

Table 1. T-Statistics for stationarity

Variable	t-statistics-level[4]	t-statistics-1st differenced	Critical value at 1%
EL	**-3.1122**	**-3.7642**	**-3.4855**
DEP_{vol}	**-4.2318**		**-3.4855**
LENR	**-2.4426**	**-4.4756**	**-3.4855**
CRE_{ps}	**1.4145**	**-6.00200**	**-3.4855**
GOVT	**-0.3856**	**-6.6312**	**-3.4855**
INFL	**-1.8569**	**-8.4713**	**-3.4855**
TBL	**-2.6856**	**-11.4439**	**-3.4855**
NIR	**-0.7878**	**-6.4089**	**-3.4855**
Y_D	**-1.7090**	**-7.4624**	**-3.4855**

As it is indicated from Table 1 all variables have a unit root except for deposit volatility as was hinted by the graphical analysis. This was the case in the study by Aikaili (2011) in which case he found all variables to be integrated of order one. Only deposit volatility is found to be non-

[4] This is levels as specified in the model, ie. Creps is the ratio of private sector credit to GDP

stationary and it was therefore not transformed. After differencing, the test statistics for all variables are larger than the critical values in absolute terms; hence, the null hypothesis of a unit root in the first differences is convincingly rejected.

4.2.3 Lag Structure of the Model

Now that unit root diagnosis has been carried out and the variables that were non stationary have been transformed, the model could be estimated. However, one of the challenges in the VAR models is determining the optimal lag length as was earlier highlighted in the previous chapter. This section will begin with the determination of the lag length which will facilitate the estimation of the required model in the next section. Table 2 shows the suggested lag structure by different selection criterion. Considering only Akaike information criteria (AIC), Schwarz information criteria (SC) and Hannan-Quinn information criteria (HQ), which are mostly used, different lag structures are suggested. AIC suggests a lag of 10 while SC and HQ suggest lags of 1 and 2 respectively. Choosing the lag length of 10 as suggested by AIC would imply 91 variables in each equation with a consequence of 21 degrees of freedom, while on the other hand a choice of a lag length of 1 as suggested by SC would imply 10 variables and 102 degrees of freedom. HQ falls in between but close to SC in terms of lag length suggested. While SC is strongly consistent but less efficient it generally delivers the correct model as compared to AIC. As Brooks (2008) shows, AIC delivers a large model in most instances and it is efficient while HQ falls somewhere in between.

Given the limited sample size, a choice for a lag length of 1 would be ideal. However, it is most likely that economic variables will not react immediately within a system but after a lag as the effect of changes in most variables works through the system with a time lag and a statistics become available to decision makers, after which there will be a reaction. The fact that most of these variables respond with a given lag, normally longer than a month, is a case to consider a lag length of 10.

Table 2. VAR Lag order selection criteria

Lags	AIC	SC	HQ
1	-41.786106	**-39.601598***	-40.899781
2	-42.869486	-38.718921	**-41.185469***
3	-42.726470	-36.609847	-40.244762
4	-42.316848	-34.234168	-39.037448
5	-42.727588	-32.678851	-38.650496
6	-43.157867	-31.143073	-38.283083
7	-43.632693	-29.651842	-37.960217
8	-43.987497	-28.040588	-37.517329
9	-46.069528	-28.156562	-38.801668
10	**-48.825486***	-28.946463	-40.759935
11	-46.068558	-26.735645	-39.347892

AIC: Akaike information criteria
SC: Schwarz information criteria and
HQ: Hannan-Quinn information criteria

4.2.4 Statistical Results and Interpretation

In Table 3, the results of the VAR (10) econometric model are presented. To aid the interpretation of results, the initial model has been reduced by removing variables that are statistically insignificant. The table shows that lagged levels of excess liquidity, credit to private sector, government expenditure, inflation, foreign reserves held by the central bank and T-bill rate are significant in explaining excess liquidity, both at 5% and 10% levels.

Table 3. Statistical estimates for VAR (10) system.

Dependent Variable: Exess Liquidity

	coefficient	std. error	t-ratio	p-value
const	-0.695726	0.308942	-2.252	0.0352 **
Log_EL_1	0.539750	0.201142	2.683	0.0139 **
ΔLog_GOVT_7	0.512525	0.209912	2.442	0.0236 **
ΔLog_GOVT_8	0.348590	0.161973	2.152	0.0432 **
ΔLog_GOVT_9	0.249178	0.113320	2.199	0.0392 **
ΔLog_INFL_5	-0.445148	0.205032	-2.171	0.0415 **
ΔLog_INFL_6	0.504790	0.227670	2.217	0.0378 **
ΔLog_NIR_7	-0.706652	0.326514	-2.164	0.0421 **
ΔTBL_7	-10.5180	4.57826	-2.297	0.0320 **
Log_CREps_7	-1.37281	0.544805	-2.520	0.0199 **

Mean dependent var	-0.304268	S.D. dependent var	0.119363
Sum squared resid	0.100011	S.E. of regression	0.069010
R-squared	0.936761	Adjusted R-squared	0.665738
F(90, 21)	3.456383	P-value(F)	0.001046
rho	-0.069676	Durbin-Watson	2.091921

The F-statistic of 3.4564 has a low p-value that is close to zero to indicate that the coefficients are jointly statistically significantly different from zero. The results also show D-Watson statistic which is close to 2, indicating that the presence of serial correlation cannot be detected in the residuals. From the results, the following can be observed and interpreted about the variables that are studied;

Excess liquidity: lag of excess liquidity has a positive impact on the current level of excess liquidity. The results indicate that it is significant at both 5% and 10% levels of significance. However, the relationship is not according to apriori expectations if the economic order quantity theory is considered. It would be expected that if past levels of liquidity were high, banks would lower the current levels and vice versa. In contrast, banks seem to have memory of past liquidity levels such that when levels were high in the past, they tend to maintain higher levels and when they are low in the past they maintain low levels maybe as the perceived comfort levels of liquidity. This is in contrast to the findings of Aikaeli (2011) but consistent with Saxegaard (2006) for the case of Nigeria and Central African Economic Monetary Community (CEMAC) region respectively.

Lending rate: lending rate is not significant in explaining excess liquidity in the banking sector. Although one would expect banks to lend out more money as lending rates increase on one hand,

the threshold theorem shows that on the other hand, banks become sceptical with increasing lending rates as the chances of default are increased and this undermines their profit maximisation efforts. The non-significance of the lending rate could lend support to the credit rationing hypothesis by Stiglitz and Weiss (1981) and Bird (1989) that at higher lending rates banks ration credit. Lending rates in Lesotho have been historically high and it could be that banks do not react to further changes on increased chances of default.

Credit to private sector: this is found to have the a priori sign though significant only after 10 months at 5% and 10% levels. The private sector in Lesotho is less developed and cannot absorb surplus funds in the banking sector to put into productive investments. Credit to private sector has been found to influence excess liquidity in most studies and it is a more prominent factor in less-developed countries (Agénor and Aynaoui (2008) and Adrianaivo and Yartey (2010)).

Foreign reserves held by the central bank (NIR): there is a negative impact of NIR on excess liquidity, at both 5% and 10% levels of significance. This is surprising, as the expectation was that increasing net international reserves increases excess liquidity from the perspective of sterilised intervention in the foreign exchange market by central banks. However, Lesotho has a fixed exchange rate regime with South Africa and the relationship is not as direct as sterilised intervention channel presumes. The answer to this could come from government expenditure, which has been found to impact positively on excess liquidity. A build-up of reserves has normally been an intention by Government of Lesotho in the past and it means the government forgoes expenditure during this build-up. By increasing its expenditure, the government draws on the reserves, lowering their level while on the other hand this increases excess liquidity in the banking sector.

Government expenditure: another confirming result is the government expenditure, which is significant at 5% and 10% levels. This has a positive impact on excess liquidity, suggesting that increasing government expenditure increases excess liquidity. As the government pays more for services and obligations, liquidity in the banking sector would increase due to increased deposits following government payments to individuals and firms that rendered their services. This is in contrast to Saxegaard (2006) finding, although he was looking at government deposit volatility and the findings by Pontes and Murta (2012) who found government expenditure to be insignificant in his study. But the lag of 11 months after which government impacts on excess

liquidity and the fact that government expenditure in Lesotho still accounts for the largest proportion of GDP could imply that government expenditure behaves like GDP.

Output deviation from trend (business cycles): output deviation is not significant in explaining excess liquidity at all levels of significance.

Deposit volatility: of interest and to note is the fact that deposit volatility is also not significant at all levels of significance. This could be a hit to the perception that deposit mobilisation by the banks is not an issue and points to the observed behaviour of non-competition for deposits amongst banks, as reflected by very low deposit rates and wider intermediation margin. It could also be that permanent deposits, those that form core deposits to banks, are so high that banks do not expect the deposit insurance to be necessary to a large extent even when there is some volatility.

T-bill rate: this has a negative impact on excess liquidity in the banking system, against the expected positive impact of T-bill, when it is regarded as the proxy for cost of illiquidity. However, if T-bill is considered by banks as an alternative investment to extending credit, then it is expected to have a negative impact. Higher rates for T-bills would make it more attractive for banks to invest in T-bills which are deemed risk-free as opposed to extending credit; hence, reducing available liquidity in circulation. For the case of Lesotho, cost could be less important to banks due to high liquidity levels and alternative investment opportunity could be more relevant to them, given low levels of credit amidst high liquidity levels.

Inflation: Inflation is significant in explaining excess liquidity although it has an alternating impact with the 5th lag being positive and the 6th lag negative. This implies an overshooting or over-correction of excess liquidity to inflation. More insights will come from variance decomposition analysis. Lesotho is a member of CMA and benefits from the relatively stable inflationary environment and as such macro-economic stability is not expected to play a bigger role in the banks decisions about excess liquidity and lending patterns.

From the choice of either VAR (1) or VAR (10), it is interesting to observe that with VAR (1) model, only past levels of liquidity are significant while all other variable are statistically insignificant. Increasing the span to 10 months, leads to most variables becoming statistically significant. This supports the issue of economic data affecting the system with a time lag in most

cases. This is more evident with GDP and government expenditure which are significant at lags of 11 and 10 for instance.

4.2.5 Variance Decomposition Analysis

VAR models are often considered a-theory and results on their own are not adequate. One of the useful tools in analysing the impact of shocks in the system is variance decomposition analysis. In Table 4, the decomposition of variance on excess liquidity due to shocks of variables in the system is indicated. For the variance decomposition the Cholesky ordering of variables seem to influence the results slightly. As a result, the order is based on the logical influence or flow of the variables in the economic system.

Government expenditure is mostly exogenous as the biggest portion is derived from SACU receipts, which account for more than 50% of government expenditure. However, part of government expenditure is determined from the system through tax collections that depend on the aggregate performance of the economy. From this interpretation, government expenditure could be thought of as the first variable in the Cholesky ordering as most variables depend on it. From government expenditure follows change in GDP which is also influenced much by the government expenditure in Lesotho, and both have influence on inflation through demand pressures for government expenditure and output deviation from production capacity for GDP. Government expenditure also affects net international reserves held by the Central Bank of Lesotho as government surplus or less expenditure translates into increased savings with the Central Bank which manifest through a build-up of reserves.

Table 4. Decomposition of variance for EL

period	std. error	Log_EL$_1$	ΔLog_GOVT	ΔLog_YD	ΔLog_INFL	DEPvol	ΔLog_NIR	ΔTBL	ΔLENR	Log_CREps
1	0.030	63.98	2.44	0.72	0.65	2.10	1.26	24.41	3.91	0.55
2	0.036	52.45	2.89	2.09	7.08	2.29	4.14	20.53	3.62	4.93
3	0.040	47.84	2.74	1.18	6.60	2.01	4.73	18.61	4.57	11.72
4	0.045	39.91	2.60	2.14	6.34	6.84	5.17	16.72	3.71	16.57
5	0.051	33.89	2.04	4.69	6.09	6.04	5.31	22.86	2.95	16.14
6	0.055	30.19	1.79	8.00	7.16	6.03	5.02	21.92	2.55	17.33
7	0.061	28.08	2.16	6.84	8.01	5.09	4.12	25.71	4.13	15.86
8	0.063	26.86	3.69	6.27	7.59	6.25	3.92	24.36	3.92	17.15
9	0.065	24.71	6.68	6.00	7.72	5.73	4.46	24.76	3.60	16.35
10	0.068	24.62	10.04	5.29	7.35	5.39	4.50	23.19	3.95	15.68
11	0.071	22.80	10.81	4.47	6.80	5.04	4.23	23.14	4.50	18.21
12	0.072	22.41	10.66	4.16	6.61	5.02	4.72	22.75	5.15	18.54

Inflation affects almost all rates in the system, i.e, lending rate and T-bill rate and these together with business deviations in turn affect the credit extension to the private sector. Deposits will also depend on the state of the economy which is much affected by the change in output and government expenditure. This logical flow results in the following Cholesky ordering; government expenditure, change in GDP, inflation, deposit volatility, net international reserves, opportunity cost of funds (T-bill rate), lending rate, credit to private sector and past levels of excess liquidity.

Considering the impulse matrix for all variables (although not depicted here), only government expenditure seems to explain itself in the short run or on period one. If a variable seem to be explained by its own shock, this suggests that it could be exogenous as only its shock explains its behaviour and no other variables does from the system (Brooks (2008)). However, this is short-lived and the shock dies quickly in the second lag. This reinforces the Cholesky ordering in which an argument is made about the extent of exogenuity of government expenditure. From Table 4, the variance decomposition for 12 months forecasts are indicated for excess liquidity as a result of shocks emanating from different variables in the system. The matrix indicates that lagged values of excess liquidity have stronger impact on the liquidity management decisions of the banks. At period one, 63.98% of the variability in excess liquidity is explained by its previous levels and the impact dies gradually until in period 12 where only 22.41% is explained by the lagged values. The second most influential variable in the short run is T-bill rate, explaining 24.41% of variability in excess liquidity in the short run. For T-bill rate, the impact seems to be stable and consistent at comparatively higher level, ranging from 16.72% to 24.76% variability in excess liquidity being explained by its shock.

There is also consistency in the impact of credit to private sector in explaining variability of excess liquidity. The impact of the innovation of credit to private sector follows past liquidity levels and T-bill rate, with the impact increasing gradually with time and low in the short-run. From period three, the impact becomes relatively material with shock to private sector credit explaining 11.72% variability in excess liquidity and increasing to a highest impact of 18.54% in variability of excess liquidity on period 12. The innovation of government expenditure seems to have more impact in the longer run than in the short run, explaining 6.68% of the variability on period nine and increasing to 10.66% on period 12. The rest of the variability in excess liquidity is explained by output deviations from trend, deposit volatility and change in net international reserves which are roughly around 5% on average.

4.3 Comparative Analysis

The following section compares the economy of Lesotho to the CMA countries, especially Namibia and Swaziland for structural differences. The comparison however excludes South Africa which is an emerging economy and therefore an outlier in terms of the characteristics being compared as indicated from the tables. For various characteristics, data is an average over 5 years for a period ranging from 2008 to 2012. According to the World Bank classification, Lesotho is the lower middle income country while Namibia and Swaziland are middle income and lower middle income countries respectively. This classification alone indicates that these countries have different economic characteristics and the two CMA countries could serve as a suitable benchmark for Lesotho in terms of financial sector development, macro-economic and financial sector characteristics.

4.3.1 Macroeconomic Characteristics

Table 5 shows that the CMA economies are very diverse in terms of size and possibly structures. The economy of Lesotho is the smallest in the CMA both in terms of aggregate output and per capita GDP at $2.1 billion and $1, 044.72 and it is followed by Swaziland at an aggregate output of $ 3.6 billion and per capita GDP of $3,020.48. Namibia follows South Africa, with South Africa being the largest economy not only in CMA but in Africa at large. Being in the same region and under the common monetary policy framework, it is not surprising that convergence is observed in the four economies in terms of macro-economic stability, as measured by inflation. For the past 5 years, inflation in the four economies averaged 7.18%.

Table 4. Macro-economic statistics

	Namibia	S.Africa	Swaziland	Lesotho
GDP	$10 billion	$341 billion	$ 3.6 billion	$2.1 billion
GDP per Capita	$5,172.38	$6,814.51	$3,020.48	$1,044.72
Government Activity	37.0%	32.1%	31.2%	63.1%
Inflation	7%	7%	7.7%	7%

Source: World Bank and International Monetary Fund

Government predominance in the CMA economies is at much different levels; in Lesotho the government is dominant in terms of its contribution to aggregate output while in other CMA countries, government lags behind. As a percentage of GDP, government expenditure is almost twice at 63.1%, compared to a range of 31.2-32.1% for other CMA countries. This shows a high level of government dominance in Lesotho and is also reflective of an often perceived view that

in Lesotho, development is still government-led whereas in other CMA countries it is private sector centric.

4.3.2 Financial Sector Characteristics

This subsection indicates financial diversity that is inherent in the four CMA countries as per statistics in Table 5. The four economies are as diverse as their sizes in terms of aggregate output. Although Lesotho is the smallest economy in terms of GDP, it has a relatively higher money supply of 38% to GDP compared to Swaziland at 29% although Swaziland has higher output as it was indicated in the macro-economic characteristics. This implies that for the same one dollar in output, Lesotho has slightly more than a dollar in exchange and implies money could be flowing at a lower velocity compared to Swaziland. South Africa has the highest supply of 79% and is followed by Namibia at 57% in line with their economies.

Table 5. Financial Statistics

	Namibia	S.Africa	Swaziland	Lesotho
Money Supply	57%	79%	29%	38%
Prime Lending Rate	10%	11%	11%	12%
Private Sector Credit to GDP	48%	150%%	24%	14%
Intermediation Margin	5%	3%	6%	8%
Number of banks	5	23	4	4
Required Reserve Ratio	1%	2.5%	3.5%	3%
Financial Inclusion	68.8%	84%	63%	81%

Source: World Bank and Finscope

In terms of prime lending rates, there is some level of convergence which is expected as the result of the common monetary policy regime, although actual lending rates could be significantly different. However, there are some marginal differences with Lesotho's lending rate at 200 basis points higher and Namibia at 200 basis points lower than South Africa and Swaziland. It would be interesting to see how the average actual lending rates compare between the four countries since prime lending rates serve only as the benchmark while the actual rates reflect the actual risk premia in a particular country and this is expected to be much different.

Credit to private sector, which is a measure of financial sector development depicts an interesting picture, with Lesotho lagging behind in the CMA at 14% while the highest is at 150%. South Africa's financial sector is highly developed in the region with much diversity, depth and breadth.

South Africa is followed by Namibia at 48% and Swaziland at 24%. The low level of credit to private sector in Lesotho could also mean poor intermediation by the banking sector as only 14% of the aggregate output is extended as credit despite the small size of the economy as compared to its peers.

Lower credit to private sector in Lesotho goes together with relatively wider intermediation margin, which also points to a number of things; on one hand the wider margin could imply that banks do not compete for deposits given that they offer lower rates in Lesotho compared to CMA region. On the other hand, it could imply that banks are willing to extend credit at relatively higher rates; hence, lower credit demand by the private sector comparatively. From the four economies, the intermediation margin seem to be smaller (for example 3% for South Africa) for countries with higher credit to private sector (South Africa at 150%) in support of the this argument. The competition for deposits, intermediation margin and credit to private sector is also related to the number of banks from the table.

South Africa has the highest number of banks in the region at 23, and followed by Namibia at 5 banks. Lesotho and Swaziland have four banks. The number of commercial banks could give a hint on competition in the banking industry and from the Table there is a relationship some relationship between this and the intermediation margin. South Africa has the highest number of banks and low intermediation margin and it is followed by Namibia in both the number of banks and intermediation margin.

With respect to the required reserve ratio there is some convergence with Namibia having the lowest ratio of 1% while Lesotho and Swaziland have 3% and 3.5% respectively. The required reserve ratio limits the level of available liquidity to the banks. It does not change frequently for most countries and the four CMA countries are almost homogeneous in respect of reserve ratio though Namibia is on the lower end, availing more to the banks to extent credit to the public.

The financial inclusion for Lesotho is quite high in line with the often observed savings rate. Lesotho has about 81% of the adult population financially included and this on the ranks of South Africa, which has the highest at 84%. Namibia and Swaziland follow behind at 68.8% and 63% respectively.

CHAPTER FIVE: CONCLUSION AND POLICY RECOMMENDATIONS

5.1 Introduction

This chapter outlines the conclusions based on the findings of the study and suggests policy recommendations that could be implemented to stem excess liquidity in the banking sector of Lesotho. Section 5.2 presents a discussion on the objectives of the study and problem statements. Section 5.3 provides the conclusions and policy options that are available to the authorities in Lesotho in addressing identified issues in the financial sector of Lesotho.

5.2 Discussion on Objectives

The objectives of this study were to identify major drivers of excess liquidity in the financial system of Lesotho, analyse their impact and propose policy measures. The two objectives have been met in the previous chapter. From the statistical results and innovations analysis, government expenditure, central bank activities, and undeveloped financial sector have been found to be the most influential factors in driving excess liquidity in the financial system. The influence of government activities on the aggregate economy and the lower level of financial sector development are seen in the comparative analysis. From the comparison, the government of Lesotho is seen to be dominant in the general economy as compared to other CMA countries and the credit to private sector is the lowest. The finding that T-bill rate has the highest influence on excess liquidity held by the banks also show that probably due to undeveloped financial sector, and maybe perceived credit risk, banks prefer to place funds with the central bank instead of extending credit to the private sector. This finding is further re-iterated by Adrianaivo and Yartey (2010), who found that in Africa banks use government instruments to increase their profits by transferring their excess liquidity to central banks through T-bill and other government instruments.

From comparative analysis, banks in Lesotho seem to not compete for deposit, probably due to high levels of excess liquidity, as reflected by relatively high intermediation margin compared to other CMA countries. Variability in deposits is not a factor in the decision making process of banks and this is in line with high level of financial inclusion which affects savings mobilisation positively.

5.3 Conclusion and Policy Options

From the discussion and the findings of this paper, it is concluded that excess liquidity in the financial sector of Lesotho is driven by undeveloped financial sector and government activities in the economy due to its predominance. With banks perceiving credit risk to be higher, they place funds in safer T-bills as an alternative to extending credit.

There are two policy implications emanating from this observation: government has to support and take initiatives that are aimed at developing the private sector and also has to take measures to develop the financial sector. A developed financial sector will avail more channels for credit by the private sector and could increase competition for public funds.

By reducing the dominance of government in the economy towards a more private sector-led development, vulnerability of the economy to shocks that are unique to the government such as high SACU fluctuations will be diversified away. This will also increase the absorptive capacity of the private sector through increased bankable projects.

Policy recommendation for financial sector development could be drawn from Adrianaivo and Yartey (2010) who identified the absence of credit assessment information, little protection for property rights as well as low level of enforcement for contractual rights to be the main impediments for financial sector development in Africa. Before banks could extend credit to private sector there is need for credit assessment information in order to assess credit worthiness of borrowers. Credit information sharing by the credit institutions is critical. An introduction of a credit bureau would help credit institutions such as banks to correctly assess customer risks based on factual historic records of clients rather than perception.

Credit is the contractual obligation by the borrower and when credit has been extended, the enforceability of this contract is another important consideration by the banks. This implies that the commercial court should be strengthened to settle commercial matters promptly so as to boost banks confidence in loans recovery in the case of defaults. Another important factor identified by Adrianaivo and Yartey (2010) is the problem of market microstructures in Africa to accommodate financial development. Improving investor base, building microstructures, information dissemination and good market practices, would be beneficial to financial sector development in Lesotho.

For deeper investor base and developed financial sector, possible lessons could also be made from the findings of Ladekarl and Zervos (2004). They highlighted areas that emerging markets should address to broaden their investor base and attract foreign investors. Of particular interest is legal and regulatory framework which strengthens the rule of law with consequences of non-compliance clearly defined.

Developing the financial sector in Lesotho with emphasis on the protection of rights for investors, broader and deeper investor base as well as reducing government dominance to move towards private-sector led growth and development, will have beneficial impact on Lesotho financial system.

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