

# **DETERMINANTS OF KENYAN COMMERCIAL BANKS DEPOSITS GROWTH**

**BY**

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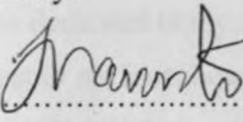
**A research paper presented to the School of Economics, in  
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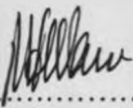
**DECLARATION**

This research paper is my original work and has not been presented for a degree award in any other university.

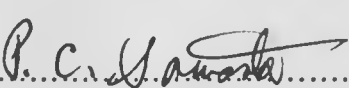
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## **DEDICATION**

This paper is dedicated to my dear mum, Grace and dad. Lomuto who struggled to take me to school to enable me learn how to read and write and my entire family for their unconditional love, great understanding, support and encouragement in ensuring that I pursued higher education.

**“Education is the most powerful weapon which you can use to change the world”**  
*Nelson Mandela*

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## LIST OF ABBREVIATIONS AND ACRONYMS

<b>GDP:</b>	Gross Domestic Product
<b>NBFI:</b>	Non-bank Financial Institution
<b>DPF:</b>	Depositors Protection Fund
<b>SACCOs:</b>	Savings and Credit Co-operative societies
<b>OECD:</b>	Organization for Economic Co-operation and Development
<b>LDCs:</b>	Less Developed countries
<b>ACEG:</b>	African Centre for Economic Growth
<b>IMF:</b>	International Monetary Fund
<b>M1:</b>	Currency in Circulation plus demand deposits
<b>M2:</b>	M1 plus time deposits
<b>ECM:</b>	Error Correction Model
<b>OLS:</b>	Ordinary Least Squares
<b>FOREX:</b>	Foreign exchange
<b>BLUE:</b>	Best linear unbiased estimator
<b>CBK:</b>	Central Bank of Kenya
<b>KBS:</b>	Kenya Bureau of Statistics
<b>KIB:</b>	Kenya Institute of Bankers
<b>EFT:</b>	Electronic Funds Transfer
<b>RTGS:</b>	Real Time Gross Settlement System
<b>AIC:</b>	Akaike Information Criterion
<b>NARC:</b>	National Rainbow Coalition
<b>ESAF:</b>	Enhanced Structural Adjustment Facility
<b>EPZ:</b>	Export Processing Zone
<b>IPO:</b>	Initial Public Offering
<b>SWIFT:</b>	Society of Worldwide Interbank Funds Telecommunication

## OPERATIONAL DEFINITION OF TERMS

- Strong bank** - Highly capitalized bank with a capital base of over 10 billion (ACEG, 2004).
- Weak bank** - Low capitalized bank with a capital base of less than 10 billion (ACEG, 2004).
- Resource gap** - The difference between exports and imports of goods and non-factor services (Ajayi, 1991).
- Savings** - Portion of disposable income not spent on consumption by households plus profits retained by firms (Baye and Jansen, 2002).
- Bank deposits** - Money or funds put in an account and entrusted to the care of a bank (Baye and Jansen, 2002).
- Liquidity risk** - Not having sufficient cash or borrowing capacity to meet deposit withdrawals or new loan demands (Fry, 1980).
- Cointegration** - An econometric technique for testing the correlation between non-stationary time series variables (Gujarati, 1999).

## ABSTRACT

In Kenya, Commercial banks deposits growth has been on a slow increase while the demand for investment resources has been rising. Given the fact that government external debt servicing reduces the available investment resources locally, there was need to establish and study the determinants of Commercial bank deposit and their implications on Kenya's resource mobilization policy. This called for an assessment of the determinants and the role played by Commercial banks in mobilization of deposits. Kenya's profile of Commercial banks structure, ownership and importance of bank deposit was analysed. Its main objective was to analyze the factors that influence Commercial banks deposit growth in Kenya.

Time series data covering 1968 – 2006 was analysed. First, the time series characteristics of the data were assessed using unit root tests to examine the stationarity of each variable. Secondly, the test for cointegration was performed to determine the long run relationship of the non stationary variables. Lastly, estimated model was a single regression equation with deposit as the dependent variable and explanatory variables as deposit rate, nominal exchange rate, investment income ratio, number of cheques cleared (used as proxy for innovations in the financial sector), real GDP, ratio of monetary GDP to total GDP and Structural Adjustment Programmes (SAPs). Estimation was done using Ordinary Least Squares (OLS) technique and Econometric Views (E-views) statistical package.

Analysed results showed that lagged Commercial bank deposits and all the other variables including Structural Adjustment Programmes (SAPs) significantly affect Commercial banks deposit growth in Kenya.

Based on these results, several policy implications were drawn that aim at encouraging deposits growth by Commercial banks for the benefit of the domestic deposit mobilization. First, growth enhancing policies promotes deposits growth. Second, the stability of macroeconomic system should be maintained. Lastly, financial sector innovations encourage deposit growth in Commercial banks in Kenya as people reduce their demand for carrying cash.

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background

#### 1.1.1 Resource mobilization and Financial sector in Kenya

Kenya's financial sector has evolved over the years since independence from periods of excessive repression to the current level of relatively fully fledged liberalization as a result of financial reforms undertaken in the sector. In the Kenyan economy, Commercial banks have played a major role in mobilization of savings for growth and development. At the level of intermediation, Commercial banks attract savers and provides them an opportunity to choose an optimal asset portfolio from a variety of financial instruments with varying risk-return and liquidity profiles in accordance with their preferences. The saved funds are then channeled to investors as debt or equity against a secure collateral with varying time profiles (Mullei and Ng'elu, 1990).

Mobilization of the domestic financial resources requires a country to have a proper institutional framework which encourages and mobilizes financial savings on one hand, and channels the mobilized funds for the purpose of capital formation leading to productive investment on the other. This role is best played by Commercial banks which are the basic component of financial institutions that promote stability in the financial system. Savings of households and other agents are collected to finance the investment needs of firms and consumption needs of individuals.

A developed Commercial banking sector also provides an institutional framework within which monetary policy can be conceived, implemented and become an effective instrument for macro-economic stability; administers a country's payments mechanism for both local and foreign transactions and achieves economies of scale in areas like risk pooling and portfolio diversification (Baye and Jansen, 2002).

The efficiency of financial institutions such as banks in promoting deposits mobilization has been recognized by policy makers and economists such as McKinnon (1973) and Shaw

(1973). Similarly, the role of banks in the economic development process has come under scrutiny since the 1950s as shown in the studies such as those of Gurley and Shaw (1955), Goldsmith (1969) and Mckinnon (1973). Though the impact attributed to financial institutions differ among the authors, the consensus has been that Commercial bank deposits are an important factor in capital accumulation for economic development (Sharma, 1978).

Since independence, Kenya has been investing a relatively large portion of its national income. The country invested an annual average of about 23 percent of GDP from 1965-1985 (Sessional paper No.1 of 1986). Over the same period, domestic income comprised 16 percent of GDP. This therefore meant that there was a resource gap of 7 percent of GDP to be financed from externally sourced resources. From 1986-2000 the country invested 25.6 percent of GDP annually with domestic saving financing 17 percent of GDP (World Bank, 2005). The persistent resource gap for Kenya has continued to worsen the external debt problem leaving low domestic savings as resources are used to finance the debt.

The growth of any economy depends on capital accumulation, and this requires investment and an equivalent amount of savings mobilized through bank deposits to match it. Savings, mobilized through deposits is a necessary engine of growth in any economy. But this has been relatively low in Kenya. Gross domestic savings as a percentage of GDP in many Countries; between 1980 and 2003, averaged 13.9 percent for Kenya, 37.4 percent for Botswana, 31.5 percent for Malaysia, 21.6 percent for Nigeria, 26.3 percent for Thailand, 23 percent for Canada and 7.3 percent for Malawi (World Bank, 2004). The low savings in Kenya is due to a combination of micro and macroeconomic factors such as relatively high inflation rate, low investment levels, wide interest spread, high incidence of poverty among the rural folk and prohibitive costs of maintaining a bank account.

### **1.1.2 Profile of Commercial Banks in Kenya**

Commercial banking began in 1896 when the National bank of India pioneered in Kenya followed by Standard bank of South Africa in 1910. Six years later, in 1916, the National bank of South Africa was established. In 1926 Barclays bank was established after amalgamation of the National bank of South Africa, with the Colonial bank and Anglo-

Egyptian bank. After the second world war, Kenya had three banks with a network of seventeen branches. More banks were set up such that at independence Kenya had ten Commercial banks.

After independence, locally owned banks were launched among them was the Co-operative bank (1968) and National Bank of Kenya (1968). Kenya Commercial bank came into existence after taking over National and Grindlays Bank (1971). All the other banks have histories dating back to the beginning of the last two centuries (Mullei and Ng'elu, 1990).

After 1980, there was an upsurge in the number of indigenously owned banks and especially Non-bank financial institutions (NBFI's) expanded more than Commercial banks attributed to the high returns in financial sector during the early 1980's. Mismanagement in the mid 1980's led to a crisis of instability and eventual massive collapse of a number of financial institutions affecting mostly the smaller banks in the sector. As a result of this, the government reacted swiftly by setting up a special investment committee on financially troubled banks. This led to the formation of the banking Act (1985), a legislation that made entry into the banking sector difficult and this also led to creation of the depositors protection fund (DPF) aimed at protecting individual investors (Republic of Kenya, 1986).

By the end of 1989, the number of Commercial banks had increased to 24 with 219 branches and 169 agencies and mobile units throughout the country. This further rose to 28 Commercial banks by 1991 and 44 Commercial banks by January 1996, the largest four Controlling 81 per cent of the Commercial banks deposits.

By January 1997, Commercial banks increased to 52 (the largest number of Commercial banks the country has ever had) an increase of eight within a period of 12 months. This rapid expansion compared to the economic growth, meant that Kenya had a large banking sector due to mushrooming of politically correct banks and was accompanied by serious weaknesses associated with oligopolistic tendencies, skewed geographical distribution and high levels of non-performing loans. This was due to conversion of some Non bank financial Institutions to

Commercial banks, for example the formation of Consolidated bank of Kenya in 1989 (Central Bank of Kenya, 1997).

By the year 2005, Kenya had a well developed financial system comprising of Commercial banks, savings and loan associations, mutual savings banks, insurance companies, pension funds and brokerage firms. Commercial banks, the oldest financial intermediaries in Kenya dominate the financial sector and account for over 80 per cent of the assets of the banking system as observed in an individual asset holding structure in table A1 in appendix I. By October 2006, the number of Commercial banks had reached 45 with over 500 branches, two Non-bank financial institutions (NBFI's), 4475 SACCOs and 93 Forex Bureaus (Central bank of Kenya, 2006).

Kenya's financial sector is fairly diversified and has experienced considerable growth after liberalization in 1991 in both number of institutions and services offered leading to claims that Kenya has a large banking sector. The recent rapid expansion of Commercial banks within the sector displays uncomfortable weakness and imbalances as its being accused of oligopolistic practices in the market. The geographical distribution of Commercial banks is highly skewed, leaving large sections of the society without banking services. Out of the 498 banking outlets at the end of 2005, for example, 50 percent were located in Nairobi and Mombasa and their environs (Central bank of Kenya, 2006).

In the Kenyan banking sector, the six largest Commercial banks account for about two-thirds of all assets, loans and deposits. The banking sector comprise of three main segments: major foreign banks (about 40 percent total assets), three sizeable banks with significant public interest (25 percent) and small mostly domestic banks (35 percent). The large foreign banks are the most profitable and well-capitalized (African Centre for Economic growth, 2004). Competition in the banking sector is hampered by a number of weak banks which are not able to exert competitive pressure on the few stronger banks and by deficiencies in the legal infrastructure (Central Bank of Kenya, 2000, 2002).

### **1.1.3 Importance of bank deposits**

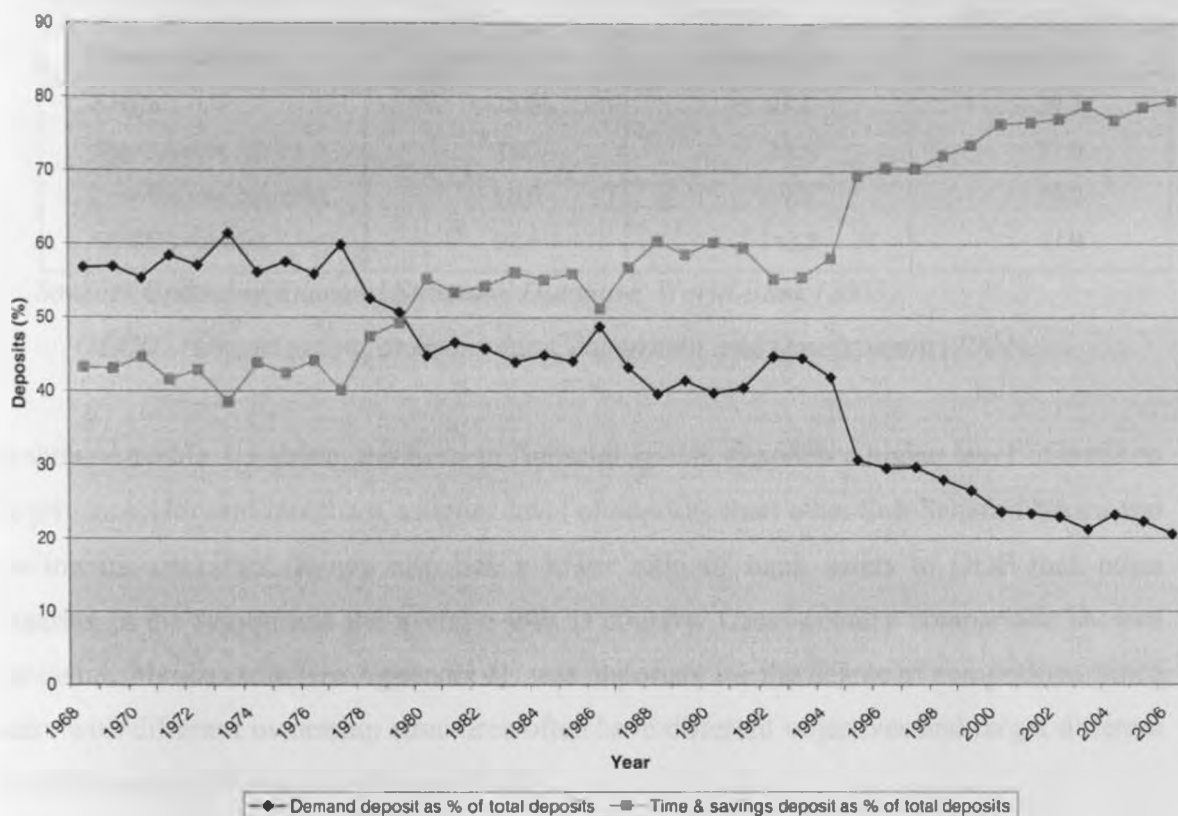
The challenge of boosting bank deposits is of great importance if Kenya is to achieve and sustain an increased investment rate and economic growth. An increase in income leads to a rise in bank deposits. As incomes rise, a larger proportion of household assets are expected to be held in financial form to facilitate a larger volume of transactions to be undertaken by the household (Blanco and Meyer, 1988). Cash incomes of households influence deposits through their effect on capacity and propensity to deposit. Deposit takes many forms including corporate, public, foreign and personal deposits (Nimal, 1991).

Kenya's average domestic savings ratio was 20 per cent over the period 1967-1995 which was still very low (Hussein and Thirwall, 2002). There is need to increase this ratio to over 30 per cent which is comparable to those of newly industrialized countries. The sources of savings include domestic private savings from households or corporate sector, retained earnings and foreign savings. Public sector's savings arise from budgetary surpluses, while foreign savings are made up of official loans and grants, together with private net capital inflows direct foreign investment and portfolio capital inflows.

Mwega, Ngola and Mwangi (1990) indicated household savings as a major component of total savings which can be mobilized for investment and industrial diversification. Domestic deposits mobilization in Kenya is mostly through household savings, public savings and firms retained earnings. Household savings are mobilized and channeled to investors partly by the financial system in cases where the saver and the investor are different, while public savings are directly channeled through development finance institutions to investors and indirectly through savings taking financial institutions. The figure that follows shows trends in Commercial banks deposits.



Figure 1.1: Trends in Commercial Banks deposits in Kenya (Shillings, Millions), 1968-2006



Source of data: Various Statistical bulletins from the CBK & Researcher's Calculations based on the data

As shown in figure 1.1 above and in table A4 in Appendix II, demand deposits as percentage of total deposits of Commercial banks over the period took a downward trend decreasing from 56.7 percent in 1968 to 20.5 percent in 2006 (Central Bank of Kenya, 2007). On the other hand time and savings deposits as a percentage of total deposits rose from 43.2 percent to 79.4 percent over the same period. The rapid growth in time and savings deposits has enhanced Commercial banks capacity to mobilize financial savings for long term lending. As a result, Commercial banks have increased their loan portfolios despite fierce cut throat competition among the players in the industry. This may be attributed to many factors among them increasing incomes and improved macroeconomic stability. However, this was against a backdrop of increasing external debt which serves to convince policy makers that Kenya has to critically address factors which influence the growth of deposits if it hopes to alleviate its pressing economic difficulties (Republic of Kenya, 2007). The table that follows shows an international comparison with the Kenya's banking system.

Table 1.1: International Comparison of the Kenya's banking system, 2001

Country/Region	Private credit/GDP	Financial deposits/GDP	Banking Sector Assets/GDP
Kenya	25.6	33.2	39.3
Sub-Saharan Africa	18.7	23.5	77.0
Low-income countries	16.0	19.5	74.2
OECD countries	92.6	113.5	47.9

Source: Update of financial Structure Database, World Bank (2003)

OECD – Organization for Economic Cooperation and Development (2001)

As shown in table 1.1 above, the Kenyan financial system channels a higher level of credit to the private sector and mobilizes a higher level of deposits than other Sub-Saharan Africa and low income countries. Kenya also has a lower ratio of bank assets to GDP than other countries in the region and the average OECD country. Cross-country comparison showed that ownership structure (see Appendix II) was important for the degree of competition, since banks with different ownership structures often have different objectives and target different clientele markets (Republic of Kenya, 2007).

## 1.2 The statement of the problem

In the Kenyan economy, Commercial banks have played a major role in mobilization of deposits for growth and development since independence. Apart from accepting deposits and lending to credit worthy borrowers against a suitable collateral, Commercial banks also play a catalytic role in facilitating growth of other sectors of the economy. Commercial banks face numerous challenges in their deposits mobilization efforts characterized by unsound financial institutions with the absence of prudent regulations and supervision with a few Commercial banks dominating the sector. Other problems include the issue of profitability of additional assets, the propensity to increase their deposit by customers and Central bank regulations which require banks to hold a non interest earning proportionate reserve cash in their account with them (ACEG, 2004).

The slow pace of economic growth experienced in Kenya in the 1980s extending to early 2000 is partly due to lack of domestic resources. However, like any other developing

economy, the mobilization of bank deposits can hardly be considered adequate to match the ever increasing demand for bank credit and other investment purposes. Limitation of internal resources has made Kenya to depend on external resources to finance her development in the recent past.

The country had increasingly relied on external resource inflows that were used for stabilization and development programmes, import support and balance of payments aid over the years. This has not only slowed down sustainable growth for Kenya but it also made it difficult for the country to plan for investment due to the fluctuations in aid inflows. There is need therefore to accelerate domestic mobilization of Commercial bank deposits growth if Kenya is to achieve the envisaged Vision 2030 objectives such as an average of 10 percent economic growth for the next 25 years (Republic of Kenya, 2007).

Commercial banks in Kenya have experienced a radical transformation in the manner they offer their services over the last one decade such as the use of internet banking, increased use of plastic money and development of more customized products and services like prestige banking. The exact nature and magnitude of this paradigm shift to banking habits on deposits is however not known. By examining the determinants of Commercial banks deposits in Kenya, this study seeks to provide information that is of importance to policy makers and the general public on their effect to the operations of Commercial banks.

A few studies have been done on deposits mobilization by Commercial banks in Kenya. They include; Mullei and Ng'elu (1990), Ochieng (1991), Maende (1992) and Asele (1997). This study attempts to update Maende and Asele's studies. The two studies focused on deposit growth and have been done under different macroeconomic and technological conditions, hence there is need to update these studies with current technological trends to further develop the literature.

### **1.3 Research Questions**

This study was guided by the following research questions;

- (i) What are the major factors determining deposits growth by Commercial banks in Kenya?

- (ii) Does financial sector technological innovations lead to higher savings, investment and hence deposit growth?

#### **1.4 Objectives of the Study**

The general objective of the study was to analyse the factors that influence Commercial banks deposit growth in Kenya. Specific objectives of the study were to:

- (i) Identify the determinants of Commercial banks deposits growth
- (ii) Estimate a model and measure the relative importance of the determinants of Commercial banks deposits growth considering recent technological trends
- (iii) Draw relevant policy recommendations

#### **1.5 Significance of the study**

The study contributes to literature in this area in several ways. First, the findings of this investigation are important to Commercial banking institutions managers. Identifying and assessing the determinants of Commercial banks financial savings is essential to all private and public savings taking institutions as they try to improve the stability and growth of deposits in Commercial banks. The study is useful to the Central Bank of Kenya, banking industry, government, further researchers and monetary policy makers in their evaluation of policy options. The findings of this study are also important to savers and other stakeholders of Commercial banks as it provides information on what determines deposits growth in Commercial banks in Kenya.

While there have been some studies done on resource mobilization in Kenya, not many have focused on determinants of Commercial bank deposit growth. Most studies carried out in Kenya mention key determinants of deposit growth but have not taken into consideration implications of emerging technological trends.

The study belongs to an expanding literature attempting to make a contribution towards the number of studies that have been concerned with domestic resource mobilization for economic development.

## **1.6 The scope and organization of the study**

The study used time series data covering period 1968-2006. This captured the pre and post liberalization periods in many sectors including the banking system. The data consisted of annual deposits levels of Commercial banks and their network establishment over the period. Independent variables included; income, interest rate, nominal exchange rate, number of cheques cleared by Commercial banks, monetary GDP, investment income ratio and dummy variable Structural Adjustment Programmes (SAPs).

The rest of the study was organized as follows. Chapter two reviewed both the theoretical and empirical literature on the issue under investigation. Chapter three discussed the methodology adopted by the study. This included the theoretical framework, specification of the model relevant to the study, variables description and expected signs, measurement of the variables and sources of data used in the study. Chapter four presented the empirical findings and discussion of the results while Chapter five covered the summary, conclusions, policy implications and limitations of the study.

## CHAPTER TWO LITERATURE REVIEW

### 2.1 Introduction

In this chapter, a review of both empirical and theoretical literature relevant to this study is undertaken. The review covers the determinants of Commercial banks deposits and their relationship to deposits growth in developing as well as developed countries.

### 2.2 Theoretical Literature

Abdi (1977) asserted that the role of banks and other financial institutions in economic development could be summarized under two distinct hypotheses: The Mckinnon-Shaw financial repression hypothesis and the structuralist explanation. The structuralist hypothesis was derived from historical interpretations of the role of banks in the capital formation processes of early European industrialization. This has little relevance to developing countries like Kenya which have undergone socio-economic transformations in its financial front.

The complementarity between money and capital accumulation is shown by the following function:

$$M/P = L(Y, I/Y, d- \pi^{\circ} \dots) \quad (2.1)$$

$$I/Y = F(R, d- \pi^{\circ} \dots) \quad (2.2)$$

Where;

$M$  is the money stock (broadly defined to include time savings deposits as well as demand deposits and currency in circulation- $M2$ )

$P$  = the price level

$L$  = includes investment income,  $I/Y$  as one of the determinants of the real stock of money and incorporates the demand for money  $M/P$

$Y$  = Aggregate real GNP

$I/Y$  = the ratio of gross investment to GNP

$R$  = is the average return to physical capital

$d - \pi^*$  = is the real return to holding money ( $d$  is the nominal deposit rate and  $\pi^*$  is expected inflation)

McKinnon (1973) view was that developing countries stressed more on foreign aid, capital inflows or disguised subsidies from industrialized nations in their strategies for economic development. This however, did not solve the root cause of economic problems facing those countries and sometimes had damaging effects. Further, theoretical analyses of resource mobilization also placed emphasis on the lack of resources and other real factors to the neglect of financial factors other than foreign exchange limitations on the capacity to import. With the assumption of self-finance nature of business in developing countries, McKinnon asserted liberalization was required to channel external funds to large and small investors who could earn high marginal and intra-marginal rates of return. The assumption also signified the fact that complementarity existed between physical capital and real money balances. Hence positive and high interest rates stimulated savings and investment as long as interest rates did not exceed real rate of return on investment.

According to proponents of financial repression hypothesis, the main sources of financial repression are government legislation policies such as legal restrictions on financial activities and interest rate policies that distort the smooth operation of the market mechanism in settlement prices for financial resources.

McKinnon's complementarity hypothesis has demonstrated that when saving is equal to investment, it can be represented by the equation:

$$M/P = L(Y, S/Y, d - \pi^*), \quad (2.3)$$

Where:

$M/P$  = Real money demand

$Y$  = Aggregate real GNP

$S$  = Financial savings

$S/Y$  = Savings/income ratio

$d - \pi^*$  = Real return to holding money

Shaw (1973) debt-intermediation view, on the other hand, focused on the role of deposit accumulation in explaining the lending potential of financial intermediation. According to Shaw's monetary model, money was backed by productive investment loans to the private sector. The larger was the money stock in relation to the level of economic activity, the greater was the extent of financial intermediation between savers and investors through the banking system. Higher deposit rates encouraged the inflow of deposits to Commercial banks, which in turn increased lending, thereby stimulating externally financed investment. The debt intermediation hypothesis was firmly based on Gurley-Shaw's (1955) inside money model.

Shaw (1973), further pointed out that the removal of financial repression via an increase in the real interest rate produced greater incentives to save and invest leading to a more efficient allocation of resources which enhanced economic growth. Thus the demand for money function in Shaw's analysis is similar to that of McKinnon (1973) as shown below:

$$M/P = L(Y, C, d-\pi^*), \quad (2.4)$$

Where;

$M/P$  = Real money demand

$Y$  = Aggregate real GNP

$C$  = Cash balances held by Commercial banks

$d-\pi^*$  = Real return to holding money

McKinnon and Shaw (1973) made a case against financially repressed economies by advocating for financial liberalization and development to accelerate the rate of economic growth. Interest rate ceilings distort the economy in four ways. Firstly, low interest rates produce a bias in favour of current consumption and against future consumption hence may reduce savings below the socially optimum level. Secondly, potential lenders may engage in relatively low-yielding direct investment instead of lending by way of depositing money in a bank. Thirdly, bank borrowers able to obtain all the funds they want at low loan rates will choose relatively capital intensive projects. Lastly, the pool of potential borrowers contains entrepreneurs with low-yielding projects who would not want to borrow at a higher market-clearing interest rate. Financial liberalization that increases interest rates induces savings. Raising interest rate ceiling also



deters entrepreneurs from undertaking low-yielding investments which are no longer profitable at higher interest rate. The rate of economic growth rises in the process and thus induces more savings.

A study by the African Centre for Economic growth (2004), attributed the rapid growth to increased monetary activities in the Kenyan economy, and particularly the rapid increase in bank branches and monetary incomes. Salami (1989), asserted that there were several measures which were needed in mobilizing and allocating bank deposits in Kenya. These included efficient development of money markets, effective supervision of financial institutions, introduction of deposit insurance and development of new financial institutions and emerging products such as structured finance.

Increase in real gross domestic product, apart from increasing the transactional demand for money, would increase the savings of the community (Sandhu and Goswami, 1986). According to Meyer (1989), an increase in income leads to a rise in deposits. As incomes rise, a larger proportion of household assets are expected to be held in financial form comprising of bank deposits to facilitate larger volumes of transactions undertaken by the household (Blanco and Meyer, 1988). They also found out that cash household incomes influenced bank deposits through their effects on capacity and willingness to save.

There is a general consensus among economists that financial resource mobilization is a very important factor in development. Hugh (1966) attempted to explore the causal relationship between financial development and economic growth. Hugh distinguished between the creation of financial institutions and services in response to demand by savers and investors and creation of financial institutions and services in advance of demand. Hugh's view that the financial sector performed a supply leading role in early stages of economic development was vindicated by Stammer (1992).

Although there has been considerable debate on the influence of interest rate on savings, the effect of this variable remains largely undetermined (Kessler and Strauss-Kahn, 1984). Economic theory indicate that savings can be influenced either positively or negatively by a rise

in interest rate. This is attributed to the substitution and income effects which move in opposite directions. In some cases the higher the interest rate offered on savings, the more attractive it is for the public to deposit funds. If interest rates are raised, the interest attraction of interest-bearing assets as compared with cash increases. This would result to a demand for bank deposits by households and this will in turn increase the supply of loans to firms and individuals (Burkett and Dutt, 1991).

Advocates of higher savings rates (Benoit and Mittendorf, 1984) argued that peasants were economically rational in their financial affairs and they needed to benefit from attractive savings rate. In countries like Taiwan and South Korea, large amounts of rural savings, have been mobilized due to high deposit rates while savings have been depressed in other countries experiencing negative real savings rate due to high inflation which distorted its growth (Ddumba-Ssentamu, 1993). High interest rates serve as an incentive that motivated households to increase their savings with the banking system, thereby enabling other households to borrow more to finance real assets (Uwe and Fischer, 1987).

Santillana (1999) presented the theoretical links between financial sector liberalization and bank saving mobilization based on the life-cycle or permanent income theory of consumption. They argued that financial liberalization increased competition between providers of financial services such as banks, thereby eliminating the constraint on borrowing. As far as willingness to save is concerned, it might be expected that the price of present consumption, namely the real rate of interest, would affect savings positively. This classical idea lies behind the financial liberalization programmes in developing countries which seek to raise the real interest rate level. In the last two decades, there has been extensive testing of financial liberalization hypothesis, and in particular the impact of interest rates on savings growth with mixed and largely inconclusive results (Hussein and Thirlwall, 2002).

### **2.3 Empirical Literature**

Many researchers have been interested in studying determinants of Commercial banks and generally mobilization of financial savings in the Kenyan economy. Empirical literature that focuses on Kenya exists by such authors as Mwega *et. al.*, (1990), Maende (1992), Asele (1997)

and others. However, their findings are diverse just like those studies in other countries. For example, early studies from Nigeria by Soyode and Oyejide (1975) examined factors which determined Commercial bank deposits in Nigeria using a specified model which disaggregated time and demand deposits. Stepwise multiple regression techniques were applied to estimate the model. The study hypothesized that there was a positive and significant relationship between branch network and savings growth in Commercial banks in Nigeria. Branching (and thus savings mobilization) policies of indigenous Commercial banks appeared to be more liberal than those of their foreign competitors. Further, Vogel *et. al.*, (1986) extended the work done by Soyode and Oyejide and revealed that the negative impact of high transaction costs among savers resulted into decreased bank deposits. The study recommended further research to better understand the links between monetary expansion and deposits.

Other studies such as those of Giovannini (1983), Lanyi and Saracoglu (1983) and Kirakul, *et. al.*, (1984) have investigated the relationship between aggregate savings and the rate of interest in developing and developed countries. However, it was difficult to find an empirically positive and significant relationship between the two variables. High savings rates may have an insignificant impact on saving mobilization as revealed by Mwega, Ngola and Mwangi (1990), who indicated that at times savers may not respond to higher interest rates if the saving instruments are not suited to their needs, technology, education levels and customs. The study recommends a number of factors that need to be taken into account when evaluating the impact of savings rate on private savings. These involve investigation of the factors that motivate private sector to save, fiscal and monetary policies practiced in the country and the investment climate. The conclusion that emerged from these studies was that the definition of money distorted the relationship between aggregate savings and interest rates.

Empirical studies revealed that in Thailand, the number of bank branches was positively associated with the volume of deposits. Srinivasan and Meyer, (1986) observed that apart from spreading the Commercial banks network, the real return on bank deposits should be sufficiently attractive to induce savers to prefer this form of financial asset to other physical assets such as gold or inventory. The study found a positive and significant relationship between the demand for deposits and the expansion of bank branches. Other studies done such as those of Go (1984)

and Kirakul *et. al.*, (1984) have demonstrated empirically a positive and statistically significant relationship between income, real interest rate and financial savings. The factors found to be important in contributing to deposits comprises macro economic policies and government intervention such as banking regulations and strengthening of the technical management of financial institutions. The studies recommended that in open economies investors should be encouraged to borrow from international capital markets to avoid investment constraints as regards to financing.

Oumah (1988) noted that there was an indication of a relationship between the level of deposits and branch network in Kenya, especially for the state owned Commercial banks. For example, banks which had deposit levels of Kenya shillings one billion and over, had more branches than those that had less this amount. These results were supported by Maende (1992) and Asele (1997) but they hasten to add that this may not necessarily be the case with foreign owned banks as they operate on a different platform as regards determinants such as exchange rate, deposit rate and others. However, the study did not test the hypothesis empirically.

Fry (1995), a leading authority on finance and development and ardent advocate of financial liberalization estimated a savings function and found a positive relationship between savings and the rate of interest for 14 developing countries. The study showed that increased proximity of depository institution branches exerted a substantial influence on rural savings in Sri Lanka, India, Korea, Nepal, Taiwan and Thailand. A similar Study by Howlander and Khan (1988) attributed the success in savings mobilization to increase in bank branches. Howlander and Khan also found the expansion of the banking system and income growth as some of the major determinants of growth of both demand and time savings deposits in Bangladesh. These studies argued that if an effect of financial liberalization on savings exists at all, it is relatively small, and that positive interest effects are easier to find in Asia than in other parts of the world. But even in Asia the effects appear to have diminished over the past two decades.

However, a device for raising deposit levels, the efficiency of branch proliferation must be qualified. Experience has shown that indiscriminate branching was no panacea (Fry, 1995). Banks made decisions on expanding their facilities by considering factors such as level of

competition, deposit potential, regional income and existence of a good infrastructure network (Doyle *et. al.*, 1981; Khalily *et. al.*, 1987).

In Kenya, Mwega *et. al.*, (1990) conducted a study on the relationship between real interest rates and the mobilization of private savings in Africa. Employing the Ordinary Least Squares, the results showed that private sector savings rate and the real demand for money are insignificantly responsive to deposit rate of interest and also that high interest rate policy reduces private sector's demand for credit. Thus the study disputed the Mckinnon-Shaw hypothesis (1973) that an increase in interest rates induces more savings and hence investment. The weight of evidence supports a weak and relatively positive elasticity of savings with respect to the rate of interest.

Ochieng (1991) specified and estimated a profit function for Kenyan Commercial banks. Variables captured in the model such as total deposits of the banks studied were found to be significant. Using time series data covering period; 1968-1988, was analysed using Ordinary Least Squares (OLS) estimation technique to obtain regression results. The study estimated the following Commercial bank total cost and profit functions:

$$C = g(D, BB, NCB, W, G) \quad (2.3)$$

Where;

$C$  = Costs of bank operations

$D$  = Total deposits

$BB$  = Number of bank branches

$NCB$  = Number of parent Commercial banks

$W$  = Represents basic factor costs

$G$  = Measures geographical distribution of deposits

According to Ochieng, banks need to collect revenues that are earned from deposits in order to earn profits. This would be the margin ( $M$ ) between interest that is paid on deposits and the interest that is earned on subsequent loans from deposits. Profit of Commercial banks, then would be;

$$\Pi = M.D - C \quad (2.4)$$

By taking the first derivative of equation (2.4) with respect to  $M$ , we obtain the profit maximizing function:

$$d\Pi/dM = h(D, BB, W, G) = 0$$

The model that was then tested using Ordinary Least Squares was:

$$\Pi = f(D, BB, LB, RB, DM)$$

Where;

$\Pi$  = Net profits of Commercial banks

$D$  = Total deposits of each Commercial bank

$BB$  = Total number of bank branches

$LB$  = Total number of branches in large urban centers for each bank

$RB$  = Number of branches in rural areas for each bank

$DM$  = Dummy variable, 1 = foreign banks, 0 = Local banks

The study reported that bank performance was greatly enhanced by opening more branches in large urban centers. The study also attributed the varying trends observed for the different categories of deposits to a shift in the composition of depositors.

Maende (1992) assessed the determinants of Commercial bank deposits in Kenya. Time series data covering period; 1968-1991, was analysed using Ordinary Least Squares and two stage least squares. A Granger test of causality was performed. The study estimated the following demand, time, savings and total deposits and branch network equations;

$$DD = f(Y_t, r_g, BC, BB, DUM, \epsilon_1), \quad (2.4)$$

$$SD = f(Y_t, r_g, i_s, BB, BC, I_n, SD_{t-1}, DUM, \epsilon_2), \quad (2.4.1)$$

$$TD = f(Y_t, r_g, i_t, BB, BC, I_n, TD_{t-1}, DUM, \epsilon_3), \quad (2.4.2)$$

Specified as;

$$D_t = f(Y_t, r_g, i_t, BB, BC, i_d, D_{t-1}), \quad (2.4.3)$$

$$BB = f(D_t, Y_t, X, I_n), \quad (2.4.4)$$

Where  $DD$  is demand deposits of Commercial banks in nominal terms,  $Y_t$  is gross national product at market prices,  $r_g$  is the yield on government bonds and securities,  $i_s$  is interest rate on savings deposits held in Commercial banks,  $BC$  is bank credit,  $BB$  is the number of bank branches,  $i_d$  is interest rate on time deposits held by Commercial banks,  $I_n$  is percentage rate of inflation and  $DUM$  is dummy variable.

Other variables include;  $D_t$  which is the total deposits of Commercial banks in nominal terms,  $X$  is the number of Commercial banks,  $i_d$  is the rate of return on Commercial banks deposits,  $D_{t-1}$ ,  $SD_{t-1}$  and  $TD_{t-1}$  refer to total deposits, savings deposits and time deposits of Commercial banks during the preceding year respectively. The results showed that stability within the banking industry was found to be a major factor determining the demand for deposits. The results also indicated a unidirectional relationship between the volume of deposits and bank branch network. The study attributed the varying savings trends observed for the different categories of deposits to a shift in the composition of depositors since independence. While the study acknowledged that bank deposits were significantly influenced by expansion of bank branches; the inverse was not backed by solid empirical evidence.

Ddumba-Ssentamu (1993) asserted that it was theoretically more meaningful to argue that the holding of deposits was more readily explained by the expected interest rate rather than the current interest rate. According to Ddumba-Ssentamu, it was assumed that total savings depended on the expected real interest rate on savings for which the proxy was the current real interest rate. The study showed that there was empirical evidence of a positive relationship between quality of bank services and deposits growth. The study further recommended that banks need to place more emphasis on providing better services to depositors. These included; a more efficient system to reduce paper work, simplification of procedures and a more improved relationship management between the bank staffers and depositors.

Kabubo and Ngugi (1995) adopted Edwards and Khan semi-open economy interest rate model modified to reflect Kenya's situation. The objectives of the study were to explore the process of financial sector reforms; investigate the structure of interest rates and their determination across institutions and to examine factors that have influenced determination of interest in the post liberalization period. The study captured the influence of open market economy by including foreign interest and exchange rates. The study used monthly data for the period: 1991-1994. Data variables in the model included; real money balances, real income, inflation rate, domestic interest rates, world interest rates and expected depreciation of local currency. The study found that both external and internal factors play a major role in determining the level of interest rates. The conclusion of the study was that nominal interest rates in Kenya were influenced by previous period interest rates, real money balances, real income and inflation rate. The study also found that monetary shocks played a significant role in interest rate determination and that there was a positive relationship between expected future price level and nominal interest rates. The study also concluded that determinants; real income, interest rates and money balances played a major role in sustaining financial reform efforts. However, the study did not cover these determinants in the pre liberalization period.

Asele (1997) conducted a study on the determinants of Commercial bank savings mobilization in Kenya using time series data covering period: 1968-1995 and employed the McKinnon-Shaw (1973) model. According to the study, analysed results showed that previous years' Commercial bank deposits affected positively the current period mobilization of deposits. Asele indicated that the lagged GDP has a positive impact on Commercial bank deposits mobilization. The coefficient was significant. This means that a one percent increase in previous years' income may lead to an increase of upto 27.8 percent rise in current bank deposits. Thus an increase in real income brings about an increase in Commercial bank deposits. Asele also found out that the coefficient of the ratio of investment to income was negative and insignificant. The study criticized the structural adjustment policies imposed on developing third world countries by the Brettonwood institutions that it had resulted to dependency on richer nations. The study advocated for more internal reforms through restructuring of the Kenyan financial sector to reduce high intermediation costs.



Shiroko (1998) assessed the impact of branch network on the performance of Commercial banks in Kenya. Based on a specified and estimated profit function for the Commercial banks being studied, the results showed that all the variables included in the model were significant. Shiroko reported that banks performance was greatly enhanced by rural expansion strategies. As a result, the study attributed the rapid increase in bank deposits to the branch expansion policies that banks were involved as a major factor that contributed to rise of monetization of the Kenyan economy. The study recommended further research to better understand how monetization of the rural sectors affected bank deposits.

Athukorala *et. al.*, (2001) conducted a study to identify determinants of savings rate in India and used income indicators; nominal interest rate, real wealth, inflation rate, public saving and level of financial intermediation (measured by population per bank branch). The result from the study suggested that real interest rate (rate of return on bank deposits) had a statistically significant positive effect on savings. This finding is in line with McKinnon-Shaw (1973) proposition that the direct income effect of high real interest rates on saving behaviour generally overwhelms the substitution of other assets for financial assets, in response to interest rate changes, in an economy where the saving behaviour was highly intensive in money and near money assets.

Bandiera *et. al.*, (2002) came up with an index of financial liberalization on the basis of eight variables; interest rates, reserve requirements, direct credit, bank ownership, prudential regulation, security markets, deregulation and capital account liberalization. The data used covered period; 1970-1994 for Chile, Ghana, Indonesia, Korea, Malaysia, Mexico, Turkey, and Zimbabwe. Based on a benchmark model the result showed that, there was no evidence of any positive effect of the real interest rate on savings. The study found out that in most cases the relationship was negative, especially in Ghana and Indonesia which was very significant. Furthermore, the effects of the financial liberalization index on savings were mixed; negative and significant in Korea and Mexico, positive and significant in Turkey and Ghana. However, the long run impact of liberalization was significant. Based on an estimate of augmented Euler equations, Bandiera *et. al.*, gave some evidence of presence of liquidity constraints. It was not established whether financial liberalization removed these constraints. The Euler equation

results may suggest, at best, that financial liberalization has had little impact on the amount of credit available to consumers through the formal financial sector. The general conclusion from the study was that there were no systematic and reliable real interest rate effect on savings; whilst the effects of liberalization had a mixed record.

A study by Hussein *et al.*, (2002) used the data of 25 sample countries from: 1972-1992, to identify determinants of saving in African countries. The result of the estimation were that the real interest rate had a positive impact on total saving in the case of 15 countries. However, the coefficient of the variable was found, to be positive and statistically significant in 8 countries and negative in 10 countries respectively. The countries that demonstrated a negative and statistically significant coefficient were; Benin, Kenya, Gabon, Madagascar, Mali, Mauritius, Nigeria, South Africa, Togo and Tunisia. The case of these countries indicated that the negative substitution effect of real interest rates outbalances the positive income effect. It further implies that a strong substitution effect prevails between present and future consumption. Similarly, the impact of gross domestic income on financial savings was statistically significant in three quarters of the countries in the sample. It was positive and significant in four countries; Kenya, Mali, Mauritius and Togo. On the other hand, the real interest rate was found to have a negative and significant effect on the total saving rate of 5 countries; Benin, Cote d'Ivoire, South Africa, Togo and Tunisia.

## **2.4 Overview of literature**

Extensive review has been conducted for theoretical and empirical studies considered to have a bearing on determinants of Commercial banks deposits growth in Kenya and other parts of the world. However, most of the studies done in Kenya support the view that in order for the country's banks deposits to grow, it has to put in place a proper institutional framework that encourages mobilization of bank deposits.

Study by Maende (1992) looked at mobilization and growth of bank deposits in Kenya by analyzing the determinants of Commercial bank deposits. The study used the Mckinnon and shaw model to assess the significance and found that branch network affected deposit growth positively. A similar model was used by Ddumba-Ssentamu (1996) and Asele (1997) to

determine the relative significance of the factors which influenced mobilization of deposits by Commercial banks. The studies found that interest rates fluctuations and gross domestic product (GDP) respectively, impacted on Commercial bank deposit growth. The studies recommended that the government should focus on ways of promoting deposit growth by addressing salient factors that acted as disincentives to savers.

Studies by Maende, Asele and Ssentamu identified important factors that determine deposit growth such as income, interest rates, bank credit, and branch network but did not consider the relative weights of each of the identified factors. The present study therefore seeks to build on the work done by Maende (1992) and Asele (1997) in assessing the significance of the identified factors covering period; 1968-2006 and further introducing a dummy variable SAPs (Structural Adjustment Programmes) representing the years when SAPs policies were implemented in Kenya.

The study also attempted to examine some important factors such as variable descriptions and expected signs, macroeconomic and political environment, of which there is little discussion in the literature. It also investigated emerging public banking habits such as the use of credit and debit cards in an effort to fill the existing literature gap.

## **CHAPTER THREE METHODOLOGY**

### **3.1 Introduction**

This chapter presents the methodology employed to examine and estimate a model which explain the determinants of deposits growth in Commercial banks in Kenya. A theoretical framework for the study is first outlined followed by a specification of a model to be estimated. The variables used in the study are explained, including the sources of data and diagnostic analyses that were done.

### **3.2 Theoretical Framework**

McKinnon (1973) analysed an economy with very limited possibilities of external finance for majority of investors. According to this analysis, the relationship between savings and interest rates could be ambiguous, in light of the opposing influences of the income and substitution effects. But the relationship between investment and interest rates was un-ambiguous. McKinnon further argued that because of lumpiness of physical capital, savers may find it convenient to accumulate funds in monetary assets until they have enough resources to invest in higher-yielding physical assets. McKinnon's Complementarity Hypothesis and Shaw's Debt-intermediation Hypothesis assume the following:

- (i.) All economic units are confined to self-finance
- (ii.) Investment is indivisible (lumpsum)
- (iii.) Potential investors therefore need to save or accumulate money balances to enable them undertake the lumpy investment.
- (iv.) The incentive to save comes from relatively low opportunity cost of accumulating money balances.

According to McKinnon, deposits may serve as a conduit for capital formation and this makes deposits and capital complementary assets. The availability of Commercial bank deposits with positive real rates of return may thus encourage both saving and capital accumulation. In the McKinnon-Shaw literature, the basis for the relationship between financial and economic development was Gurley and Shaw's (1955) debt-intermediation hypothesis. In this framework an increase in financial saving relative to the level of real economic activity

increases the extend of financial intermediation and raises productive investment which, in turn, further raises per capita income. In these models, nominal interest rates controls inhibit capital accumulation because they reduce the real rate of return on bank deposits, thereby discouraging financial savings. Higher reserve requirements also exert a negative influence on financial intermediation by increasing the wedge between lending and deposit rates. Under a competitive banking system, this wedge is an increasing function of the rate of inflation (Fry, 1995).

Shaw (1973) also stressed the importance of positive real deposit rates as an inducement to save in financially repressed economies. But unlike McKinnon, Shaw emphasized external rather than internal financing possibilities as the effective constraint on capital formation. Shaw's paper focused on the role of deposits as a source of funds for financial intermediaries and argued that high deposit rates may stimulate investment spending by allowing the supply of credit to expand in line with the financing needs of the productive sectors of the economy.

Consider a consumer who expects to live three periods and has utility function that depends on consumption in each one of these periods. The consumer earns income only in the first two periods and saves part of it for consumption in the third period. Savings can be invested in deposits with financial institutions or in physical capital. The consumer can finance some of the asset holdings with loans in the first two periods, and can repay all the loans, liquidate all assets, and consume all the wealth in the third period, since there are no bequests. When capital markets function smoothly, the consumer's asset holdings will reflect the rate of time preference, the rates of return on the various assets and liabilities, and, if these returns are uncertain the attitude towards risk.

### **3.3 Model Specification**

McKinnon-shaw (1973) hypothesis postulates that financial intermediation is repressed when interest rates are too low and the higher the real rates of interest, the higher the incentive to save to gain the highest return.

The demand for bank deposits function can be expressed as;

$$D/P = f(Y, (d-\pi^*), I/Y, NC, EX, W/Y, SAPs), \dots \dots \dots (3.3)$$

Where;

$D/P$  = Real money balances in form of deposits

$NC$  = Number of cheques cleared by commercial banks at time (t)

$EX$  = Nominal exchange rate

$W/Y$  = Monetary GDP

$SAPs$  = Structural adjustment programmes, 1 = for years when  $SAPs$  policies were implemented and 0 = for years when there were no  $SAPs$

The above variables can be defined as a vector of variables of  $X$ , and expressed as;

$$X = f(D/P, Y, (d-\pi^*), I/Y, NC, EX, W/Y, SAPs) \dots \dots \dots (3.3.1)$$

If  $S = D/P$  and

$$Z = (Y, (d-\pi^*), I/Y, NC, EX, W/Y, SAPs) \dots \dots \dots (3.3.2a)$$

Then, these variables can further be expressed in a conditional model which becomes:

$$D(S/Z_t, X_{t-1}, \lambda_t) \dots \dots \dots (3.3.2b)$$

Where;

$S_t$  – Dependent variable

$Z_t$  - Explanatory variable.

$X_{t-1}$  Previous year interest

$\lambda$  - Coefficient of variables of interest

### 3.4 Variables description and expected signs

#### Commercial bank deposits ( $D/P$ )

This was the dependent variable. This is the money or funds put in an account and entrusted to the care of a bank. Commercial banks offer various differentiated categories of deposit accounts that target individual and corporate customers in meeting their returns and withdrawal demands. Banks attract depositors by offering competitive interest rates to enable them increase their deposit levels. They would in turn hold a prudentially acceptable level of reserves to meet

demand deposits and avoid risks. The rest of the deposits would be lent out as loans. An increase in deposits enhances availability of credit, stabilizes interest rates, investment and results to growth in an economy. This measure was preferred because it gives annual levels of deposits collected by Commercial banks.

**Gross domestic product (Y)**

Refers to the total market value of all final goods and services produced within a country in a given period of time, usually a calendar year. It is also considered as an estimate of the total money value of all final goods and services produced in a given year by factors of production owned by a particular country's residents. Households receive income in form of wages, interest or dividends resulting from investments held. A portion of this income is used for consumption and the rest is saved and this increases Commercial banks deposit.

Commercial bank deposits constitute one of the several forms of financial assets in which the public can invest its wealth in order to maximize utility. An increase in national income would then be expected to have a positive effect on bank deposits growth. It is also generally assumed that currency preference is stronger in rural areas where most of the savings are held in real assets like cattle and land and that there are less banking facilities in rural areas. There exists therefore, a positive relationship between income and deposit growth as more and more people are employed and their wages rise, a proportion of their incomes that is saved increases. This can be represented by the equation shown below:

$$\delta D / \delta Y_i > 0 \dots\dots\dots (3.4)$$

Where;

$\delta D_i$  = Change in deposits

$\delta Y_i$  = Change in GDP

The link is even more complex when the relation between income and interest rates is analysed. A decline in the rate of interest is like a shift in the autonomous component of investment. It produces multiple responses resulting to an increase in income and a rise in deposit. According to the permanent income hypothesis, which distinguishes between permanent income and transitory components of income, households will spent mainly their permanent income, while

the transitory income is channeled to deposits with marginal propensity to save from this income approaching unity (Shaw, 1973). The rate of growth in income is used as an explanatory variable in empirical studies on deposits. Increased growth rates in income are expected to have a positive effect on household savings (Sharma, 1978).

**Interest rate ( $d- \pi^*$ )**

This measures the fee or return paid on borrowed capital for example assets lent may include money, shares or consumer goods. Interest is calculated upon the value of assets in the same manner as upon money. Interest rate can be thought of also as rent on borrowed money. The fee resulting from the rate is compensation to the lender for foregoing other useful investment that could have been made with the loaned funds. Instead of the lender using the assets directly, they are advanced to the borrower. The borrower then enjoys the benefit of using the assets ahead of the effort required to obtain them, while the lender enjoys the benefit of the fee paid by the borrower for the privilege. Interest is therefore the price for credit.

Real interest rate measures part of interest earnings which genuinely increases the purchasing power of an individual after accounting for inflation. Assuming that funds are available in unlimited amounts to borrowers of every description at the market rate of interest. In reality there exists no such a thing as the market rate of interest. What exists is a whole range of complex types of interest rates. The rate paid by any particular borrower depends on such variables as the term and size of the loan, the collateral offered, and especially the credit worthiness of the borrower. In recent times, it has been observed that a decline in deposit rates reflects increased liquidity in the money market manifesting itself through over-subscription for government securities and initial public offering (IPO). Declining deposit rates therefore will tend to influence deposit growth negatively. A positive relationship is therefore expected between deposits growth and the yield on these assets as shown in the following equation:

$$\delta D / \delta r_g > 0 \dots\dots\dots (3.4.1)$$

Where;

$\delta D$  = Change in deposits



$\delta r_E$  = Change in interest rate

It is also worth noting that the effect of interest rate may also be explained by the inflation effect, that is assuming nominal rates of interest are constant, and a rise in the inflation rate lowers the real cost of borrowing which in turn increases consumer expenditure and lowers the level of deposits.

### **Investment income ratio ( $I/Y$ )**

Investment refers to an asset held to have some recurring capital gains. It is an asset that is expected to give returns without any work done on the asset *per se*. It also refers to the production per unit time of goods which are not consumed but are to be used for future production. Examples include tangibles (such as building, railway or factory) and intangibles (such as a year of schooling or on-the-job training). This study therefore, used the GDP at current prices meaning that nominal prices of the reporting periods were used to capture the sum value of all goods and services produced in the economy in a given year. GDP at current prices allowed determination of either an increase or a decrease in production when exchange rates changed. A positive relationship was expected between this variable and deposits. As an income variable, higher investment expenditure should raise deposits growth.

### **Number of cheques cleared ( $C$ )**

A cheque is a negotiable instrument instructing a financial institution to pay a specific amount of a specific currency from a specified demand account held in the drawer or depositor's name with a financial institution. Both the drawer and payee may be natural persons or legal entities. A Cheque is a paper-based payment instrument and must be physically presented to the institution on which they are drawn to make a demand for payment or dishonour decision made on the cheque.

Cheques are still a very common payment mode used by individuals and institutions to settle their bills. It is therefore used as a debit instrument by the drawer in reducing account balance and transferring the same value to benefit the payees account. The number of cheques cleared was used as a proxy for technological innovations in the financial sector where innovation is expected to reduce demand for savings (M2). Increase in the number of cheques cleared

generally was expected to relate positively to deposit as it enhances credit creation within the financial system.

### **Exchange rate (*EX*)**

This was the number of units of foreign currency that can be purchased for one unit of the domestic currency. Exchange rate is also known as the rate between two currencies and specifies how much one currency is worth in terms of the other. An exchange rate quotation is given by stating the number of units of "term currency" or "price currency" that can be bought in terms of 1 unit currency, also called base currency. Bilateral exchange rate involves a currency pair while effective exchange rate is the weighted average of a basket of foreign currencies and can be viewed as an overall measure of the country's external competitiveness.

A market based exchange rate changes whenever the values of either of the two component currencies change. A currency tends to become more valuable whenever its demand is greater than the available supply. It becomes less valuable whenever demand is less than available supply. This does not mean people no longer want money. It just means that they prefer holding their wealth in some other form, possibly another currency. A rise in exchange rate was expected to reduce deposit held by Commercial banks.

### **Monetary GDP (*W/Y*)**

This was the total money supply within the domestic economy as a proportion of the total GDP. In a growing economy, as output increases the demand for money increases. To meet this growing demand for money, the banking system increases money supply through launching of new branches especially in remote non banked regions of the country that may encourage the inhabitants in these areas to transform part of their wealth from other forms of assets such as livestock, land and farm produce into Commercial bank deposits. Consequently, the deposits in the banking system would increase translating to a rise in monetary GDP, used to capture the degree of monetization of the economy. Part of the money supplied will be withdrawn in cash and the other part will be retained within the banks as deposits. The higher the public relative preferences for borrowing from banks, the more are bank deposits (Sandu and Goswami, 1986). An expansion of monetary GDP will influence bank deposits positively.

### **Structural adjustment programmes (SAPs)**

This refers to the policies that were imposed by the International Monetary Fund (IMF) and the World Bank in the late 1980s and early 1990s to the developing world. These included an assortment of policy packages that were geared towards poverty reduction and promoting economic growth in developing countries. At the height of their implementation, the structural adjustment programmes became part of the conditionalities and yard-stick on how third world economies should be managed that the donor community tied to release crucial funding to third world governments.

Privatization and liberalization were some of the major measures that were aimed to break the cycle of poverty in developing countries. In Kenya, for example, some of the cost-cutting measures introduced included cost sharing in public schools and hospitals. Strict adherence to these measures may have lead to mixed results, but generally, it was expected that SAPs would promote economic growth leading to a rise in incomes hence deposits growth.

### **3.5 Estimation techniques**

Equation (3.3.1) was estimated using ordinary least squares (OLS) estimation method. Before carrying out estimation, diagnostic tests were conducted on the time series variables. A specification associated with error correction model (ECM) was applied. This involved testing for the order of cointegration of each variable using the Augmented Dickey Fuller unit root tests (ADF). This is because time series data exhibits non-stationary characteristics. The ADF test assumes that the data generating process is autoregressive. An autoregressive process is one that considers only one period such that observation at time  $t$  depends only on the observation at time  $t_1$ . Either way, there may be autocorrelation in the error term which biases the test. To overcome this problem, the study used (ADF) test.

#### **3.5.1 Unit root tests**

Time series data may exhibit a trend of unit root(s) over time. If the mean and variance do not vary systematically over time (Gujarati, 1999), then it becomes a stationary series. A stationary stochastic process implies that the underlying stochastic process that generated the series was invariant with time. The result that come from an econometric analysis when using non

stationary series are ambiguous (Philips, 1986). Granger and Newbold (1974) ascertained that non-stationarity time series produce spurious regression results which may suggest statistically significant relationship when in reality there are no meaningful relationships between the variables.

Economic time series with the presence of unit roots may be de trended to remove the non-stationarity trend in it. It requires differencing to ensure that any autocorrelation is removed and the error term is white noise.

### 3.5.2 Cointegration analysis

Granger (1987) argued that a linear combination of two or more non-stationary series may yield a stationary series. If such a linear combination exists, then the non-stationary series are said to be cointegrated. This means that the non-stationary series move closely together over time, and the difference between them is stable. This will result in a linear combination known as cointegrating equation, and it may be interpreted as a long-run relationship between the variables.

The study performed tests for cointegration using the Augmented Dickey-Fuller (ADF) in testing stationarity of the variables. The results showed that all the variables were non stationary and integrated of order one. This meant that all the variables apart from real deposit rate had to be differenced once to render them stationary. After establishing the order of integration, the study further checked whether the non-stationary variables were cointegrated. This was aimed at further establishing whether there existed a long run relationship amongst non stationary variables. This was done by generating residuals from the long-run equation of the non-stationary variables, which were then tested for stationarity using the ADF test. The result showed that the test statistics were greater than the critical values implying that there was a unit root hence the model used for estimation did not incorporate the error correction term to capture long run relationship.

Engle and Granger (1987) cointegrating regression is specified as follows;

$$X_t = \beta_0 + \beta_1 z_t + \varepsilon_t$$

Residuals of the equation;  $\varepsilon_t = (X_t - \beta_0 - \beta_1 z_t)$

where;  $X_t$  = is financial sector development

$Z_t$  = Vector of explanatory variables such as real income, interest and exchange rates

$\beta_0$  &  $\beta_1$  = Coefficients of prudentially required assets and explanatory variables respectively

$\varepsilon_t$  = Error term

### 3.5.3 Diagnostic tests

This involved tests that were carried out to indicate a model inadequacy or failure. For example, in the case of the linear regression model estimated by OLS, a series of diagnostic tests were used to indicate whether any of the assumptions required for OLS to be the best linear unbiased estimator (BLUE) appeared to be violated. These assumptions included a serially uncorrelated and homoscedastic error term, absence of correlation between the error term and the regressors and correct specification of the model. This study carried out various diagnostic tests such as autocorrelation residuals, the white test for heteroscedastic errors and normality test for the distribution of residuals.

### 3.6 Data type and sources

The data consists of annual observations of the variables that include Commercial bank deposits, real GDP, real deposit rate, ratio of deposits to GDP, number of cheques cleared at any one time as proxy for innovation in banking sector, nominal exchange rate and ratio of monetary GDP to total GDP. The study used mainly published data obtained from Central Bank of Kenya (CBK), Kenya Institute of Bankers (KIB), and the Kenya Bureau of Statistics (KBS). Other sources included IMF International Financial statistics yearbook and World Bank World Tables. Refinement was made on the data to satisfy the simplifying assumptions of the classical normal linear regression model to ensure normality of the residuals during estimation.

### 3.7 Data analysis

After the raw data was collected, it was cleaned, refined and converted into the required data as described in part 3.4 of this chapter. Descriptive statistics of all the variables were analysed and the trends in the data are presented. This was followed by a linear regression in order to establish the relationship among the data variables. Regression was carried out using the E-Views econometric software.

## CHAPTER FOUR EMPIRICAL FINDINGS

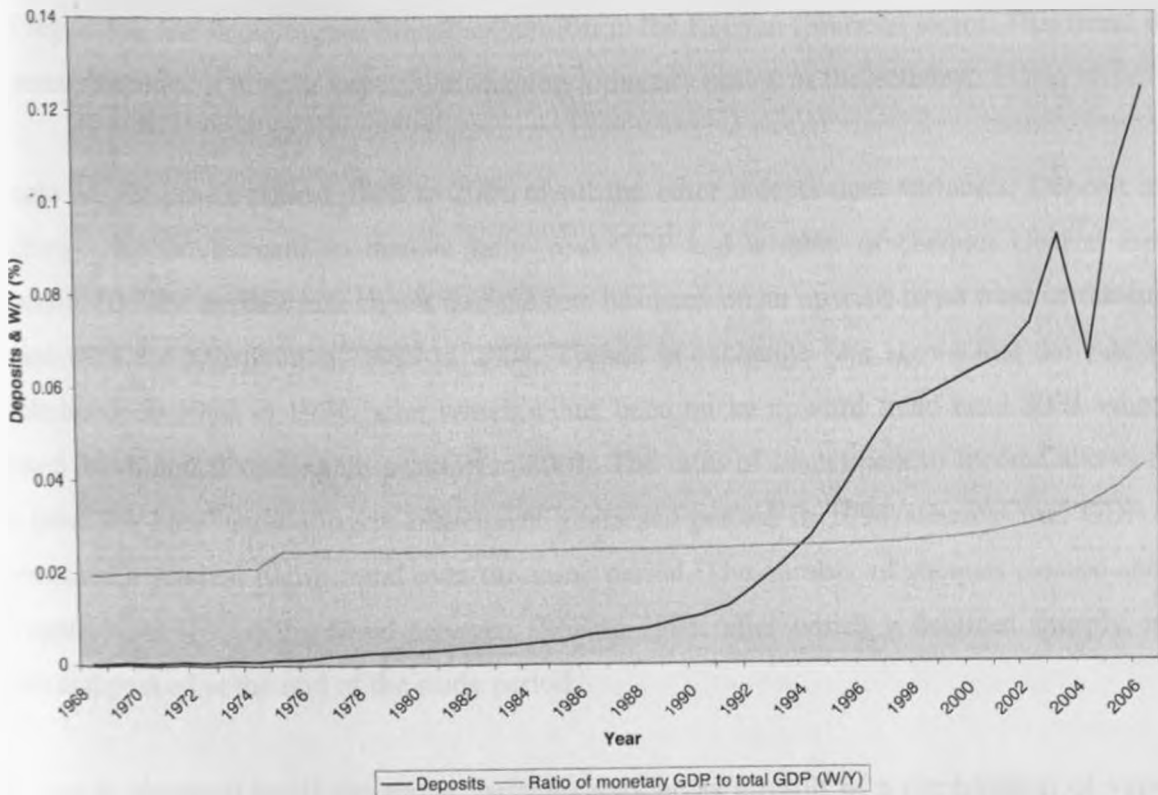
### 4.1 Introduction

This chapter presents analysis of the empirical results of the study. The chapter begins with the trending of the variables and descriptive statistics, which gives the normality tests of the series among other statistics. This is then followed by the time series properties of the variables. The last section of this chapter embarked on presenting regression results, diagnostic tests results and finally the discussion of the results.

### 4.2 Trends in the variables

Before discussing time series properties of the variables, their trends were first analyzed. Figure 4.1 below graphs the trends in deposits and the ratio monetary GDP total GDP.

Figure 4.1: The trends in deposits and ratio of monetary GDP to total GDP, (1968 - 2006)



The graph shows that deposits have been increasing over the period of the study with the exception of 2002 and 2003 when there was a slump which might have been caused by persistent drought experienced in the country and lack of donor funding. The tempo sustained beyond the year 2004 may have been due to renewed economic optimism exhibited by Kenyans after the Narc government came into power in 2002, and utilization of idle existing capacity resulting to rapid GDP growth from 0.6 percent in 2002 to 6.1 percent in 2006.

The graph also shows that the ratio of monetary GDP to total GDP has been increasing at a decreasing rate compared to deposits growth over the same period of the study. This may be as a result of financial malpractices such as the Goldenberg scandal and the excess liquidity created by the expansionary financing of the 1992 general elections. This trend continued with the exception of 1995 to 2006 when the economy appears to have recovered from the post liberalization inflationary pressures that began in early 1990's. The upward trend from 2000 may also be as a result of improved reforms undertaken by the Central bank of Kenya such as self regulation and encouraging branch expansion in the Kenyan financial sector. This trend was important because it plays a key role in shaping monetary policy in the country.

Graphs for the entire period 1968 to 2006 of all the other independent variables: Deposit rate, exchange rate, investment to income ratio, real GDP and number of cheques cleared are in appendix III. The deposit rate shows that the rate has been on an upward trend most of the study period with the exception of 1999 to 2004. Trends in exchange rate shows that the rate was stable between 1968 to 1972, after which it has been on an upward trend until 2001 when it slowed down and it rose again peaking in 2001. The ratio of investment to income shows that the trend has been undulating in subsequent years and peaked in 1994, whereas real GDP has maintained a gradual rising trend over the same period. The number of cheques cleared shows an upward but fluctuating trend between 1968 to 1991, after which it declined sharply, rose again and peaked at the end of the study period.

The trends observed in all the above variables may be as a result of a combination of various micro and macroeconomic reforms undertaken by the Central bank of Kenya coupled by other external factors over the period of the study. These reforms carried out by the Central Bank

included refining monetary policy operations and procedures in order to enhance efficiency and effectiveness in the dynamic financial and economic environment, liberalization of interest and exchange rates and introduction of government debt instruments such as treasury bills and bonds. Other reforms were; tightening of the fiscal policy, monetary policy attempts to control high inflation, balance of payment deficits, rapid credit expansion and the government adopted comprehensive economic reform programmes (Enhanced Structural Adjustment Facility) policies that tackled fiscal, monetary, structural and external issues.

#### 4.3 Descriptive statistics

Before progressing on the detailed empirical issues, it is important to examine whether the data exhibited normality. The Jarque-bera statistics test was used to test normality of the series. It utilised the mean based coefficients of skewness and kurtosis to check normality of variables used. Skewness was the tilt in the distribution and was expected to be -2 and +2 range for normally distributed series; Kurtosis was expected to be within -3 and +3 range if the data were normally distributed. Where the probability value was less than Jarque-Bera chi-square at the 5 percent level of significance, the null hypothesis was not rejected. Table A5 in Appendix IV gives the summary of the descriptive statistics of the data used in this study.

The table gives the summary statistics of the main variables that have been included in the model and their correlation results. The descriptive statistics presented in Table A5 in the appendix include the mean, median, standard deviation, minimum, and maximum. The results showed that the variable deposits had a minimum value of Kshs 0.718 and a maximum value of Kshs 6.161 billion with a mean of Kshs 3.591 billion and a median of Kshs 3.467. The deposits variable is highly dispersed more than real GDP as shown by the standard deviation of 1.683. This implies that there was high variation in deposit levels over the study period. This result is consistent with that of Ddumba-Ssentamu (1993) study that was carried out in Uganda, who found high variations in deposit growth in the Ugandan Commercial banking system.

Deposit rate and exchange rate have minimum value of Kshs 0.888 and Kshs 1.932 billion and maximum value of Kshs 2.912 and Kshs 4.364 billion respectively. This might be because each year, some Commercial banks do not significantly adjust their deposit and exchange rates.



Number of cheques cleared had a standard deviation of 0.425 which is much lower than other determinants apart from investment income ratio. Implying that, the number of cheques cleared and investment income ratio exhibit the least disparity compared to the rest of the determinants in the Kenyan Commercial banking system.

Real GDP had a minimum value of Kshs 2.343 and a maximum value of Kshs 7.276 billion. It also had the highest mean and second highest standard deviation of 1.596 in contrast to the ratio of monetary GDP to total GDP and investment income ratio which had 0.130 and 0.262 respectively. This meant that the other determinants had the highest range of disparities compared to monetary GDP to total GDP and investment income ratios.

The normality test showed that real money balances in form of deposits, real return to holding money, nominal exchange rate, investment income ratio, number of cheques cleared, and real GDP were normally distributed while monetary GDP to total GDP ratio and Structural Adjustment Programmes were not normally distributed.

Though descriptive statistics directed on which of the equation was more able to yield better results and highlighted on possible problems to encounter, there was need to enhance the statistics by more insightful quantitative analysis such as the correlation matrix. The correlation matrix was an important indicator that tested the association between the explanatory variables. The matrix also helped to determine the strength of the variables in the model, that is, which variable best explained the relationship between real growth of Commercial bank deposits and its determinants. This was important and helped in deciding which variable(s) to drop from the equation. Table A6 in Appendix IV presents the correlation matrix of the variables at levels.

According to the correlation matrix, there was positive correlation between deposits, exchange rate, investment-GDP ratio, number of cheques cleared, monetary GDP to total GDP ratio, real GDP and SAPs. Similar correlation applied to the lags of these determinants apart from that of; deposits, deposit rate, investment-GDP ratio and real GDP which were negatively correlated to deposits. These results reflected the expected output.

#### 4.4 Time series properties

Working with non-stationary variables leads to spurious regression results from which further inference is insignificant. The first step was therefore to test for stationarity of the variables. Augmented Dickey-Fuller (ADF) tests were used to test for stationarity of the series. The results of the test for all the series are presented in Table A7 in Appendix IV.

The results showed that all non lagged variables were non-stationary and were integrated of order one. This implied that all these variables apart from real savings deposit rate had to be differenced once to render them stationary. The Commercial bank deposit, real GDP, ratio of investment to GDP, nominal exchange rate, ratio of monetary GDP to total GDP and the number of cheques cleared were stationary after lagging once. The real savings deposit rate was stationary after lagging twice.

The tests also showed that all non lagged variables were stationary after first differencing. The next step after finding out the order of integration was to establish whether the non-stationary variables at levels were cointegrated. The aim of this was to establish whether there was a long run relationship amongst non stationary variables. The concept of cointegration implies that if there was a long-run relationship between two or more non-stationary variables, deviations from this long run path were stationary. To establish this, the Engel-Granger two step procedure was used. This was done by generating residuals from the long-run equation of the non-stationary variables, which were then tested for stationarity using the ADF test. The result of cointegrating regression are given in Table A9 in Appendix IV.

The coefficients of determination (Adjusted  $R^2$ ) was high (0.9218), meaning that the power of the variables (deposit rate, nominal exchange rate, ratio of investment to GDP, number of cheques cleared, ratio of monetary GDP total GDP and real GDP) to explain changes in Commercial bank deposits was high. The Akaike information criterion (AIC) suggested the presence of trend in the cointegrating relationships using tests of the endogenous and exogenous variables.

To check whether the variables were cointegrated, residuals from the above cointegration regression were derived. Table A10 in Appendix V reports the stationarity test for the residuals of the co-integrating regression. The results in the Appendix indicate the test statistics were greater than the critical values implying that there was a unit root. The non stationarity of the error term means that the variables are not cointegrated. The model used for estimation therefore did not incorporate the error correction term to capture long run relationship.

#### 4.5 Empirical results

The model was estimated using differenced non-stationary variables lagged one period. This gave results for overparametized model as shown in table A8 in Appendix IV. The general model was overparametized and as such is difficult to interpret in any meaningful way. The general model allowed the identification of the dynamic patterns in the model and then reduce the model to a more parsimonious one. Thus the general model was reduced until a preferred model was arrived at. This was done by assigning zero coefficients to those variables where the "t" statistic is low in general model results and checking the significance of F-statistic. The results obtained after reducing the size of the model are given in Table 4.1 below:

Table 4.1: The preferred model results

Variable	Coefficient	t-Statistic
Constant	-13.460*	-4.855
Lagged deposits	0.698*	-2.223
Deposit rate	0.503*	3.997
Exchange rate	0.826*	5.475
Investment to income ratio	-0.431**	-2.393
Number of cheques cleared	0.078**	2.244
Monetary GDP to total GDP	2.752**	4.339
Income	0.001***	1.857
Structural adjustment programmes	0.311**	2.388
Adjusted R-squared		0.984
Akaike info criterion		-0.061
Schwarz criterion		0.331
Durbin-Watson stat		1.301
F-statistic		281.367
Prob(F-statistic)		0.000*

Note: \* significance at 1%

\*\* significance at 5%

\*\*\* significance at 10%

The coefficients of the variables are very essential in the analysis of the data. The coefficients of variables represent percentage change in the dependent variables as a result of percentage

change in the independent variables. The coefficients of determination (Adjusted  $R^2$ ) was 0.984, meaning that 98.4 percent variations in Commercial bank deposits were explained by lagged deposits, real deposit rate, exchange rate, investment to income ratio, number of cheques cleared, monetary GDP to total GDP and real GDP. The F-statistic was 281.367 and statistically significant at 1 percent, implying that all the independent variables considered together, strongly explained the dependent variable. All the independent variables had the expected signs.

The coefficients of lagged deposits, deposit rate and exchange rate, were statistically significant at 1 percent level, while coefficients of investment to income ratio, number of cheques cleared and monetary GDP to total GDP had the correct sign and were significant at 5 percent. The coefficient of real GDP was stable and statistically significant at 10 percent.

#### **4.6 Diagnostic Tests**

Before proceeding with the discussion of the regression results, the preferred regression model was subjected to a number of diagnostic tests in order to evaluate its validity. These were: the LM-autocorrelation, which supplement the DW (Durbin Watson) statistics, the ARCH (Autoregressive conditional heteroscedasticity) test which detects the problem of heteroscedasticity, the Jarque-bera test for normality of the residuals and the Ramsey RESET test for specification of the regression. In addition to the above tests, CUSUM test was also done. The results obtained revealed that the parameters were stable and the model could be used for forecasting at the 5 percent level. Apart from Jarque-Berra normality test, which was distributed as chi-square statistics, the rest of the diagnostic tests utilized the F-statistics distribution. A summary of these tests is included in Table 4.2 below:

Table 4.2: Diagnostic tests results

Type of test	Coefficient	Probability
Ramsey RESET Test:		
F-statistic	1.871608	0.174025
White Heteroskedasticity Test:		
F-statistic	2.014222	0.068821
ARCH Test:		
F-statistic	1.094661	0.413241
Breusch-Godfrey Serial Correlation LM Test:		
F-statistic	1.012361	0.464176

Normality test used the null hypothesis of normality against the alternative hypothesis of non-normality. If the probability value was less than Jarque-Bera chi-square at the 5 percent level of significance, the null hypothesis was not rejected. The Ramsey RESET Test for model specification, ARCH Test and White Heteroscedasticity Test for constant variance of residuals and Breusch-Godfrey Serial Correlation LM Test for serially correlated residuals used the null hypothesis of good fit (specification), homoscedasticity, and non-autocorrelated against the alternative hypothesis of model mis-specification, heteroscedasticity, and autocorrelated respectively. If the probability value was less than F-statistics at the 5 percent level of significance, the null hypothesis was not to be rejected. The diagnostic test outcomes were satisfactory. Normality and CUSUM tests are given in appendix V figure A6. The CUSUM tests suggest that there were no major structural breaks in the data apart from the period beyond 1996 where there seems to be some minor break.

#### 4.7 Discussion of the results

The results in table 4.1 above indicate that the coefficient of the lagged dependent variable was positive and significant at 1 percent implying that the previous years Commercial bank deposits affected positively the current period's mobilization of deposits. This agrees with earlier results by Asele, (1997) who found lagged Commercial bank deposits positively affected the current period mobilization of deposits.

The real GDP had a positive input in Commercial bank deposits mobilization. The coefficient was significant at 10 percent. This implied that a 1 unit change in real income may lead to a 0.001 unit change in bank deposits. This increase in real income brings about an increase in savings via bank deposits *ceteris paribus*. These results showed that there was a positive relationship between deposit growth and real GDP. The coefficient of real GDP was positive and significant. This was expected and conforms to literature because an increase in real Gross Domestic Product implies an increase in purchasing power, which, apart from increasing the transactional demand for money, would increase the savings of the community. As incomes rise, a larger proportion of household assets are expected to be held in financial form comprising of bank deposits. This result is in agreement with Sandu and Goswami (1986), Blanco and Meyer (1988) results.

The coefficient of the ratio of investment to income was negative and significant. This implied that Commercial bank deposits were negatively influenced by the investment income ratio. This result agreed with complementarity hypothesis and results obtained by Asele (1997) who found coefficient of the ratio of investment to GDP negative and significant. This result was inconsistent with earlier work by Santillana (1999) who found out that a rise in investment activities contributed positively to deposit growth.

The real saving deposit rate of interest, had a positive coefficient and significant. Thus the real saving deposit rate of interest significantly influenced Commercial bank deposits in Kenya. This result was consistent with the financial repression hypothesis by McKinnon and Shaw (1973), Go (1984) and Kirakul *et. al.*, (1984), who found that high real saving deposit rate increased financial savings and hence investment. This result was inconsistent with that obtained by Mwege *et. al.*, (1990) and Bandiera *et. al.*, (2002) who found that private sector savings rate and the real demand for money are insignificantly responsive to deposit rate of interest.

Number of cheques cleared by Commercial banks had a positive effect on Commercial bank deposits. The coefficient was significant at 5 percent. The number of cheques cleared reduced the demand for money (M2) hence Commercial bank deposits. The number of cheques cleared was also used as a proxy for financial innovation in the study hence the result gave the expected

sign that financial innovations reduced the demand for holding money hence a rise in Commercial bank deposits. This implies that majority of the populace who earlier preferred cheques as a mode of bill settlement may have adopted electronic means such as electronic funds transfer (EFT), society of worldwide interbank funds telecommunication (SWIFT), western union, moneygram, real time gross settlement system (RTGS), credit and debit cards.

The coefficient of nominal exchange rate was positive and significant. This implied that there had been no major currency substitution over the period under study. People might have preferred domestic bank deposits rather than foreign deposits due to their appreciation rate during devaluation or depreciation of the Kenya shilling.

The ratio of monetary GDP to total GDP contributed positively to the mobilization of Commercial bank deposits over the study period. The coefficient had the expected sign and it was significant. This showed that in Kenya, the degree of monetization of the economy has had an enormous effect on the mobilization of Commercial bank deposits. This may be due to factors such as the rapid increase in bank branch network in the recent past which has enabled majority of the rural population access to banking services. This result is consistent with earlier work by ACEG (2004), Maende (1992) and Asele (1997), who attributed rapid growth in monetary activities to increased bank expansion.

The structural adjustment programme (SAP) was found to be positive and significant at 5 percent level. This might be because policies pursued by the Kenyan government under the programme may have promoted other macroeconomic stabilization programmes such as devaluation and interest rate changes. This in turn ultimately affected Commercial bank deposits positively.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

#### 5.1 Summary

Kenya's Commercial bank structure showed that time and savings deposits have been in the increase while demand deposits have been declining. Given the fact that government public debt servicing reduced the available investment resources locally, there was need to establish the determinants of Commercial bank deposit and their effect on deposits growth. This study examined the role and profile of Commercial banks and the importance of bank deposits in economic growth, if Kenya expected to achieve compliant financial services sector objectives as enumerated in Vision 2030 (Republic of Kenya, 2007). The study was mainly motivated by lack of updated studies specifically geared towards the dynamic Commercial banking system deposits growth in the country. Most of the studies have dealt generally with resource mobilization and have not disaggregated between bank deposits and other types of financial and non financial savings. The main objective of this paper was to analyse the factors that influenced Commercial banks deposit growth in Kenya. The study had three specific objectives; first, to identify determinants of Commercial bank deposits growth, second to estimate a model and measure relative importance of the determinants of Commercial bank deposits growth considering recent technological trends. The final objective which was accomplished in this chapter was to draw relevant policy recommendations based on the results.

The study provides evidence on the empirical relationship on deposit growth and GDP in Kenya using thirty eight year time series data over the period 1968-2006. A specification of the empirical model used in this study was based on the theoretical literature, specifically from the works of Shaw (1973) and McKinnon (1973). The study used the McKinnon-Shaw (1973) model to measure the significance of the determinants of Commercial bank deposits growth in Kenya. The methodology used on the theoretical framework was also developed by both Shaw and McKinnon (1973) separately and adopted from works on savings by Mwega *et. al*, (1990) and Asele (1997). Unit root tests were performed with the objective of ensuring non spurious results.



## 5.2 Conclusions

The results confirmed that real GDP, ratio of investment to income, real savings deposit rate, number of cheques cleared, nominal exchange rate, ratio of monetary GDP to total GDP and SAPs, exhibited significant effect on Commercial bank deposit growth in Kenya over the period 1968–2006. Lagged deposits, real savings deposit rate and exchange rate have proved to be crucial in mobilization of savings in form of bank deposits. As an increase in real income enhances the savings rate. The coefficient of the ratio of monetary GDP to total GDP was found to be positive and significant. This implied that the degree of monetization has had a considerable effect on Commercial bank deposits growth in Kenya. The ratio of investment to GDP had the right sign and was significant.

Using the model of the “best fit” the study found that increasing the real rate of deposit impacts positively on mobilization of Commercial bank deposit growth. Real deposit rate of interest was positive and significant in this study. This may be as result of the government starting to adjust interest rates upwards as part of the SAPs supported by world bank and IMF hence the impact of deposit rate on Commercial bank deposit has had a major impact. This may have encouraged the stimulation of savings via bank deposits from small savers. This result is consistent with results obtained by Asele (1997) and Athukorala *et. al.*, (2001).

The number of cheques cleared which was used as a proxy for technological innovations in the financial sector was found to significantly affect Commercial bank deposits. The number of cheques cleared reduced the demand for money (M2) hence Commercial bank deposits.

## 5.3 Policy implications

The findings of this study can be used to provide policy guidance that would enhance policy planning, implementation, monitoring and appraisal in the area of Commercial bank deposit mobilization in Kenya. There is need for macroeconomic stability, the establishment of conditions that favour private investment and strengthening bank supervision and the legal infrastructure, which enhances financial stability. This is crucial for achieving positive results as these reforms lower costs and risks associated with instabilities in the banking sector and hence addressing the high intermediation margins. Further, the study suggested that encouraging

deregulation on real deposit rate would not only be good for deposits growth, but also it could directly enable access resources for investment. The result was consistent with the complementarity hypothesis.

From the regression results, the major determinants of deposit mobilization by Commercial banks in Kenya are number of cheques cleared, which is a proxy of financial innovations as used in this study, real deposit rate, exchange rate and lagged bank deposits. Real GDP also significantly contributes to financial savings. It has a positive and significant coefficient, thus having a positive influence on bank deposits. As such a policy which increases the real income will ensure a boost in deposit growth. Thus in Kenya the government in partnership with the private sector should implement growth enhancing policies such as the introduction of infrastructure bonds to built roads, granting tax holidays for manufacturing firms operating under the export processing zone (EPZ), liberalization of the poorly performing parastatals and offering tax rebate incentives for manufacturing firms who do value addition to their products (Republic of Kenya, 2007).

The nominal exchange rate has significant and positive effect on mobilization of bank deposits. Thus a stable and gradually rising exchange rate policy needs to be adopted to protect depreciation of the Kenyan shilling which leads to erosion in bank deposits.

Ratio of monetary GDP to total GDP was also significant in mobilizing savings. Based on the findings, a policy such as offering tax incentives on branch expansion and lowering costs on maintaining an account with a bank enhances the monetarisation of the economy and is essential in boosting sustainable deposit growth. This will attract majority of the rural unbanked populace to save their assets in Commercial bank deposits hence leading to an increase in deposits.

#### **5.4 Limitations of the study and Areas for further research**

The study was based on published data which has its weaknesses. The study only focused on Commercial bank deposits which is only part of financial savings in the financial system. The non bank financial institutions deposits were not considered. This restricts generalization of conclusions to the entire financial system. The study didn't consider all the variables that may be

perceived to influence deposits such as interest spread, credit to private sector and political stability. This was because data required for these variables was not readily available and in some cases approximations had to be made for the variables used.

The scope of further study in this area is unlimited. For instance, a study on the determinants of Commercial banks profitability growth would be useful. Also of importance is a study on the reasons behind the massive wave of bank failures that occurred during the 1980s and 1990s would thus be of benefit in formulating policies that will enhance stability in the sector.

## BIBLIOGRAPHY

- Abdi, A. (1977). *Commercial Banks and Economic Development*, The Experience of Africa, New York: Praeger Publishers.
- African Centre for Economic Growth. (2004). Improving Financial Sector Performance in Kenya. Proceedings of the First Financial Sector Forum Mombasa, Kenya.
- Ajayi, S. I. (1991). 'Macroeconomic Approach to External Debt: The Case of Nigeria'. AERC Research Paper No. 8 Nairobi: African Economic Research Consortium
- Asele, P. (1997), Determinants of Financial Savings by Commercial Banks in Kenya, University of Nairobi, M.A Research Paper
- Athukorala, P. and Sen, K. (2001), *The Determinants of Private Saving in India*: New Delhi, Oxford University Press.
- Bandiera, G. Caprio, P. Honohan, and Schiantarelli. (2000), "Does Financial Reform Raise or Reduce Saving?", *Review of Economics and Statistics* 82(2) 239-63.
- Baye, M.R. and D.W. Jansen. (2002). *Money Banking and Financial Markets: An Economic approach*. New York: Houghton Mifflin.
- Benoit, P.V. (1984), "Artificially Low Interest Rates versus Realistic or Market Interest Rates", *In Savings and Development*, ed. By Kessler , D. and Ullmo, P.A., Economica paris Vol.3, 83-95
- Blanco, R. and Meyer, R.L. (1988), Rural Deposit Mobilization in the Philippines, 1977-1986, Working Paper Series No. 88-115, Philippine Institute for Development Studies.
- Burkett, P. and Dutt, A.K. (1991), Interest Rate Policy, Effective Demand and Growth in LDCS," *International Review of applied Economics*, Vol.5 No.2, pp 665-721.
- Central Bank of Kenya. (2000-2006). Banks supervision Annual Reports. Nairobi: CBK.
- Ddumba-Ssentamu, J. (1993). The Role of Commercial Banks in Deposit mobilization in Uganda, Unpublished Ph.D Thesis, Makerere University.
- Doyle, P.F., Fenwick, I. And Savage, G.P. (1981), "A Model of Evaluating Bank Location and Performance", *Journal of Bank Bank Research*, Vol. 41. No.4, pp 253-290.
- Fry, M. (1995), *Money, Interest and Banking in Economic Development*, Baltimore: John Hopkins University Press.
- Fry, M.J., (1980), "Saving, Investment, Growth and the Cost of Financial Repression", *World Development*, Vol 8. No.4, 317-327.

- Giovannini, A. (1983), "The Interest Elasticity of Savings in Developing Countries: The Existing Evidence", *World Development* 11, 7 (July), 601-607.
- Giovannini, A., (1985), "Saving and the Real Interest rate in Less Developed Countries". *Journal of Development Economics*, Vol 18. PP 197-217
- Go, E. (1984), *Domestic Resource Mobilization Through Financial Development Thailand*, Manilla: Asian Development Bank, Economics office.
- GoldSmith R.W. (1969), *Financial Structure and Development*. New Haven.
- Gujarati, D., (1999), *Essentials of Econometrics*, New Delhi, McGraw Hill International, Second Edition.
- Gurley, J.G. and Shaw, E. (1956), "Financial Intermediaries and The Savings Investment Process", *Journal of Finance*, Vol.II. pp 30-33
- Gurley, J.G. and Shaw, E. (1960), *Money in Theory of Finance*, Worshington D.C: Brookings Institution.
- Howlander, S.R. and Harun – ar – Rashid Khan (1988), "Bank Deposits in Bangladesh: Levels, Trends and Determinants". *Journal of Business Administration*, Vol. 14 No.4. pp 60-74.
- Hugh, P.T. (1986), "Financial Development and Economic Growth in the underdeveloped countries", *Economic Development and Cultural change*, No.2, Vol XIV. pp 329-348.
- Hussein, K.A. and Thirlwall, A.P. (2002), "Explaining differences in The Savings Ratio Across Countries: A panel Data Study, *The Journal of Development Studies*, Vol.5 No.9, 22-26
- Kabubo, J.W and Ngugi, R.W, (1995), "Financial Sector Reforms and Interest Rate liberalization: The Kenyan experience". AERC Discussion Paper, Forthcoming.
- Khalily, M. and Meyer, R. (1987), "Deposit Mobilization In Bangladesh: Implications for Rural Financial institutions and Financial Policies", *The Bangladesh Development Studies*, Vol XV. pp 687-689.
- Kessler, D. and Strauss-Khan, D. (1984), "Note of Wealth – Oriented Approach in Savings Behaviour in Developing Countries", *Savings for Development*, United Nations, New York.
- Kirakul, S. (1984), "Household savings", Bank of Thailand . *Quarterly Bulletin*, Vol.24 No.4. pp 253-290.
- Lanyi, A. and Saracoglu, R. (1983), "Interest Rate Policies in Developing Countries", International Monetary Fund, Occasional Paper No.22, Washington DC.

- Maende, A.M.** (1992), *Mobilization and Growth of Bank Deposit In Kenya: An Empirical Analysis*. University of Nairobi, M.A Research paper
- McKinnon, R.** (1973). *Money and Capital in Economic Development*. Washington D.C: Brookings Institution.
- Meyer, R.L.** (1989), "Mobilization of Rural Deposits : Discovering the Forgotten Half of Financial Intermediation", *Development Southern Africa*, Vol. 6 No.3. pp 30-33.
- Mittendorf, H.J.** (1984), "Savings Mobilization for Agricultural and Rural Development in Africa", In Kessler, D. and Ullmo P.A. ed. *Savings and Development*, Ed. Economica, Paris: Vol.3: 115-123.
- Mwega, F.M., Ngola, S.M. and Mwangi, N.** (1990), *Real Interest Rates of Private savings in Africa*. AERC, Research Paper 2, Initiatives Publishers, Nairobi.
- Mullei, A.K. and Ng'elu, J.M.** (1990). "Evolution and Performance of Kenya's Financial System" *Savings and Development*, Vol. 14 No.3: 265-284.
- Nimal, A.F.** (1991), "Determinants of Rural savings in Papua New Guinea", *Savings and Development*, Vol. 2. No.4. pp 211-218.
- Ochieng, A.J.** (1991), *Branch Network and Performance: A case of Commercial Banks in Kenya*. University of Nairobi, M.A Research Paper
- Oumah, O.P.G.**, (1988), *The Relationship between the use of strategic marketing and bank Performance in Kenya*, University of Nairobi, MBA research paper
- Philips, P.C.B. and Perron, P.** (1988), "Testing for a unit root in time Series regression", *Biometrika*, 75, pp 335-346.
- Republic of Kenya.** (1965), *African Socialism and its Application to Planning in Kenya*. Sessional Paper No.10. Nairobi: Government Printer.
- Republic of Kenya.** (1986), *Economic Management for Renewed Growth*. Sessional Paper No.1. Nairobi: Government Printer.
- Republic of Kenya.** *Statistical Abstracts*, various issues. Nairobi: Government Printer.
- Republic of Kenya.** *Economic Surveys*, various issues. Nairobi: Government Printer
- Republic of Kenya.** (2007), *Kenya Vision 2030, A competitive and Prosperous Kenya*. Nairobi: Government Printer.
- Salami, K.A.** (1989), "Financial intermediaries and Savings Mobilization In Kenya" *Finance Magazine*, Feb. 1989

- Sandu, H.S. and Goswami, R.H. (1986), "Determinants of Commercial Bank Deposits in India", *The Indian Economic Journal* Vol.34 No.1. pp 175-212.
- Santillana M. (1999). Savings and Financial Sector Development: Key Issues. Paper presented at the International Conference on Finance and Development, 9-10 July. Manchester:
- Sharma K.S. (1978), "The Role of Financial Intermediaries in Mobilization and Allocation of Resources for Rural Development". *Indian Economic Journal* Vol.26. No.2. pp 655-672.
- Shaw, E.S., 1973, *Financial Deepening in Economic Development*, New York: Oxford University Press.
- Shiroko, E.N. (1988), Bank Branches and Demand for Money in Kenya, University of Nairobi, M.A Research paper
- Soyode, A. and Oyejide, T. (1972), "Branch Network and Economic Performance: A case study of Nigerian's Commercial Banks", *Nigeria Journal of Economic and Cultural Change*, 1972. Vol. 12 No.2, pp 238-256.
- Srinivisan, A. and Meyer, R.L. (1986), An Empirical Analysis of Rural Deposit Mobilization in South Asia, *Economics and Sociology, Occasional Paper* No. 1249, Department of Agricultural Economics and Rural Sociology, The Ohio State University.
- Stammer, D.W. (1983), "Determinants of Savings: Theory and Evidence", *OECD Economic studies*, No.1. pp 118-124.
- Uwe, C. and Fischer, B. (1987), Domestic Resource Mobilization in Thailand: A success case of Financial Deepening? Kiel Institute of World Economic Department IV, Diisternbrooker Weg 120, D – 2300 Kiel: Kiel Working paper No 307.
- Vogel, R. and Burkett, P. (1986), "Deposit Mobilization In Developing Countries: The importance of Reciprocity in lending", *Journal of Developing areas*, Vol.20, No.4, pp 273-292.
- World Bank (2004). *World Development Report 2004*. New York: Oxford University Press.
- World Bank and UNDP. 2002. African Development Indicators. Washington, D.C.:World Bank.
- World Bank (2003). *World Development Indicators, 2003*; Washington, DC: World Bank.
- World Bank (2004). *World Development Indicators, 2004*; Washington, DC: World Bank.
- World Bank (2005). *World Development Indicators, 2005*; Washington, DC: World Bank.

## APPENDICES

### Appendix I: Raw and Refined Data

Table A1: Raw Data used for Analysis

Year	Deposits in Kshs billions	Gross domestic income in Kshs billions	Deposit rate	Investment/GDP	Number of cheques cleared	Exchange rate	Monetary GDP/Total GDP	SAPs
1968	1823.00	9595	3.5	9.818836	3737	7.14	75.2	0
1969	2050.38	10416	3.5	11.79668	4083	7.14	75.89	0
1970	2550.98	11499	3.5	11.49428	3110	7.14	77.1	0
1971	2787.80	12845	3.5	11.39467	3979	7.14	77.96	0
1972	3176.68	13776	3.5	12.57777	4244	7.14	78.07	0
1973	4036.64	15790	3.5	11.42197	4343	6.92	79.45	0
1974	4319.13	18776	4.32	13.08411	5786	7.14	80.72	0
1975	5265.47	21140	5.13	13.41671	4921	8.25	94.39	0
1976	6598.11	25562	5.13	16.17239	6641	8.31	94.61	0
1977	9961.07	32699	5.13	17.89585	7038	7.95	95.01	0
1978	11721.16	35601	5.13	17.51807	9505	7.49	94.38	0
1979	13160.47	39543	5.13	17.46183	8732	7.33	93.99	0
1980	13516.18	44648	5.75	17.36262	5410	7.57	94.09	0
1981	15242.03	51641	8.85	18.60231	5628	10.29	94.16	0
1982	17532.50	58214	12.2	16.68305	6379	12.73	94.35	0
1983	18593.45	66218	13.27	16.94294	7948	13.8	94.08	0
1984	21099.02	72550	11.77	13.95416	7777	15.78	93.93	0
1985	23194.60	100831	11.25	15.54987	5605	16.28	94.42	1
1986	29485.90	117472	11.25	15.89166	6283	16.04	94.84	1
1987	32031.00	131169	10.31	15.73496	6879	16.52	94.73	1
1988	35246.70	151194	10.33	15.64262	5078	18.59	94.62	1
1989	41677.70	171589	12.57	15.68289	5823	21.6	94.72	1
1990	47343.50	195536	13.67	16.90192	6734	24.08	95.2	1
1991	56959.30	224232	13.69	18.94266	5291	28.07	95.52	1
1992	76623.40	264475	13.71	19.31207	3141	36.22	96.11	1
1993	97996.00	333616	13.73	22.46184	7850	68.16	96.54	0
1994	124816.30	400700	13.75	27.93026	10642	44.84	96.93	0
1995	166146.60	465654	13.6	24.72492	10875	55.94	97.36	0
1996	210345.60	687998	17.59	26.81867	10978	55.02	97.95	0
1997	251196.30	770312	16.72	24.83066	11234	57.06	98.91	0
1998	257831.00	850808	18.40	23.75603	11407	61.91	100.22	0
1999	271758.90	906928	9.55	22.91392	11851	72.93	102.05	0
2000	286575.00	967838	8.19	21.99429	12124	78.04	104.60	0
2001	299796.00	1020020	6.64	23.60896	12316	78.68	108.15	0
2002	330396.00	1035370	5.49	25.31764	12232	77.07	113.07	0
2003	416307.00	1138060	4.13	12.24985	12284	76.14	119.92	0
2004	294189.00	1286460	2.43	21.89021	13125	77.34	129.45	0
2005	473736.00	1445480	5.08	21.55352	13823	72.37	142.65	0
2006	560417.00	1642400	5.14	23.08035	15291	69.39	161.03	0



Table A2: Refined Data Used for Analysis

Year	Deposits in Kshs Millions	Gross domestic income in Kshs billions	Deposit rate	Investment/GDP	Number of cheques cleared	Exchange rate	Monetary GDP/Total GDP	SAPs
1968	1.82	9.60	3.50	9.82	3.74	7.14	75.20	0
1969	2.05	10.42	3.50	11.80	4.08	7.14	75.89	0
1970	2.55	11.50	3.50	11.49	3.11	7.14	77.10	0
1971	2.79	12.85	3.50	11.39	3.98	7.14	77.96	0
1972	3.18	13.78	3.50	12.58	4.24	7.14	78.07	0
1973	4.04	15.79	3.50	11.42	4.34	6.90	79.45	0
1974	4.32	18.78	4.32	13.08	5.79	7.14	80.72	0
1975	5.27	21.14	5.13	13.42	4.92	8.25	94.39	0
1976	6.60	25.56	5.13	16.17	6.64	8.31	94.61	0
1977	9.96	32.70	5.13	17.90	7.04	7.95	95.01	0
1978	11.72	35.60	5.13	17.52	9.51	7.40	94.38	0
1979	13.16	39.54	5.13	17.46	8.73	7.33	93.99	0
1980	13.52	44.65	5.75	17.36	5.41	7.57	94.09	0
1981	15.24	51.64	8.85	18.60	5.63	10.29	94.16	0
1982	17.53	58.21	12.20	16.68	6.38	12.73	94.35	0
1983	18.59	66.22	13.27	16.94	7.95	13.80	94.08	0
1984	21.10	72.55	11.77	13.95	7.78	15.78	93.90	0
1985	23.19	100.83	11.25	15.55	5.61	16.28	94.42	1
1986	29.49	117.47	11.25	15.89	6.28	16.04	94.84	1
1987	32.03	131.17	10.31	15.73	6.88	16.52	94.73	1
1988	35.25	151.19	10.33	15.64	5.08	18.59	94.62	1
1989	41.68	171.59	12.00	15.68	5.82	21.60	94.72	1
1990	47.34	195.54	13.67	16.90	6.73	24.08	95.20	1
1991	56.96	224.23	13.69	18.94	5.29	28.07	95.52	1
1992	76.62	264.48	13.71	19.31	3.14	36.22	96.11	1
1993	98.00	333.62	13.73	22.46	7.85	68.16	96.54	0
1994	124.82	400.70	13.75	27.93	10.64	44.84	96.93	0
1995	166.15	465.65	13.60	24.72	10.88	55.94	97.36	0
1996	210.35	688.00	17.59	26.82	10.98	55.02	97.95	0
1997	251.20	770.31	16.72	24.83	11.23	57.06	98.90	0
1998	257.83	850.81	18.40	23.76	11.41	61.91	100.22	0
1999	271.76	906.93	9.55	22.91	11.85	72.93	102.05	0
2000	286.58	967.84	8.10	21.99	12.12	78.04	104.60	0
2001	299.80	1020.02	6.64	23.61	12.32	78.60	108.15	0
2002	330.40	1035.37	5.49	25.32	12.23	77.07	113.07	0
2003	416.31	1138.06	4.13	12.25	12.28	76.14	119.91	0
2004	294.19	1286.46	2.43	21.89	13.13	77.34	129.43	0
2005	473.74	1445.48	5.08	21.55	13.82	72.37	142.65	0
2006	560.42	1642.40	5.14	23.08	15.29	69.39	161.03	0

## Appendix II: Structure of the Kenyan Banking System and Deposits growth, (2006)

Table A3: The structure of the Kenyan Banking System (2006)

#	Bank Name	Total Assets (Kshs bn)	Ownership (%)	Nature of Ownership
1.	Barclays Bank of Kenya Ltd.	91.9	20.05	Foreign
2.	Standard Chartered Bank Ltd.	61.9	13.8	Foreign
3.	Kenya Commercial Bank Ltd.	58.5	13.1	Government
4.	Citibank NA	28.9	6.5	Private
5.	Co-operative Bank of Kenya Ltd.	28.5	6.4	Private
6.	National Bank of Kenya	26.1	5.8	Government
7.	Commercial Bank of Africa	15.6	3.5	Private
8.	Investment & Mortgage Bank	10.1	2.3	Private
9.	CFC Bank Limited	9.9	2.2	Private
10.	National Industrial Credit Bank	8.8	2.0	Foreign
11.	Stanbic Bank Kenya Limited	8.3	1.8	Foreign
12.	Diamond Trust bank Kenya	6.5	1.4	Private
13.	First American Limited	6.3	1.4	Private
14.	Bank of Baroda	5.9	1.3	Foreign
15.	Credit Agricole Indosuez	5.8	1.3	Foreign
16.	Fina Bank Limited	5.2	1.2	Private
17.	Bank of India	5.1	1.1	Foreign
18.	Akiba Bank Limited	4.4	1.0	Private
19.	Prime Bank Limited	4.2	0.9	Private
20.	Giro Commercial Bank	4.1	0.9	Private
21.	Guardian Bank	3.8	0.8	Private
22.	Habib AG Zurich	3.8	0.8	Foreign
23.	Imperial Bank Limited	3.7	0.8	Private
24.	Victoria Commercial Bank Ltd.	3.5	0.8	Private
25.	Middle East Bank of Kenya	3.3	0.7	Foreign
26.	Habib bank Limited	3.3	0.7	Private
27.	African Banking Corporation	3.3	0.7	Private
28.	Southern Credit Banking Corporation	2.9	0.6	Private
29.	Development Bank of Kenya	2.7	0.6	Foreign
30.	Equatorial Commercial Bank	2.5	0.6	Private
31.	Delphis Bank Limited	2.3	0.5	Private
32.	Consolidated Bank of Kenya	2.3	0.5	Government
33.	Credit Bank Limited	2.0	0.4	Private
34.	Charterhouse Bank Ltd.	2.0	0.4	Private
35.	Transnational Bank Limited	1.9	0.4	Private
36.	K-REP Bank	1.9	0.4	Foreign
37.	Industrial Development Bank	1.6	0.4	Government
38.	Chase Bank Limited ]	1.5	0.3	Private
39.	Paramount Universal bank	1.1	0.2	Private
40.	Fidelity Commercial Bank	1.0	0.2	Private
41.	Dubai Bank Limited	0.7	0.2	Private
42.	City Finance Bank	0.7	0.1	Private

43	Daiwa Bank Limited	0.4	0.1	Private
<b>TOTAL</b>		448.3	100.0	
Privately Owned Banks		130.4	28.9	
Government - owned banks		88.5	19.8	
Foreign - owned banks		229.3	50.9	

Source: ACEG, 2006

Table A4: Commercial Banks deposits in Kenya (Shillings, Millions), 1968 – 2006

Year	Demand Deposits	Time and Saving Deposit	Total Deposits	Demand Deposits as % of Total Deposits	Time and saving Deposit as % of Total Deposits
1968	1035.93	788.29	1824.22	56.78756	43.21244
1969	1302.84	986.52	2289.36	56.90848	43.09152
1970	1607.76	1297.5	2905.26	55.33963	44.66037
1971	1825.5	1298.26	3123.76	58.43919	41.56081
1972	1954.21	1468.01	3422.22	57.10358	42.89642
1973	2432.49	1525.79	3958.28	61.45321	38.54679
1974	2809.52	2192.15	5001.67	56.17164	43.82836
1975	3088.69	2276.34	5365.03	57.57079	42.42921
1976	3651.06	2885.7	6536.76	55.85428	44.14572
1977	5286.47	3539.07	8825.54	59.89968	40.10032
1978	5808.29	5239.8	11048.09	52.5728	47.4272
1979	6635.81	6449.57	13085.38	50.71163	49.28837
1980	6284.79	7749.32	78134.11	44.78225	55.21775
1981	6839.46	7831.18	85370.64	46.62005	53.37995
1982	7538.73	8929.04	16467.77	45.77869	54.22131
1983	8432.51	10761.29	19193.8	43.93351	56.06649
1984	9908.72	12173.83	22082.55	44.87127	55.12873
1985	10359.31	13142.96	23502.27	44.07791	55.92209
1986	13738.1	14435.26	28173.36	48.76273	51.23727
1987	13381.25	17581.49	30962.74	43.21727	56.78273
1988	14896.09	22724.07	37620.16	39.59603	60.40397
1989	17069.75	24103.47	41173.22	41.45838	58.54162
1990	18764.38	28451.18	47215.56	39.74194	60.25806
1991	21798.3	32037.5	53835.8	40.49034	59.50966
1992	30894.45	38139.69	69034.14	44.75242	55.24758
1993	40324.67	50284.81	90609.48	44.50381	55.49619
1994	46352.35	64244.75	110597.1	41.9113	58.08901
1995	43975.06	99416.08	143391.1	30.66791	69.33209
1996	47328.18	112721.59	160049.8	29.57091	70.42909
1997	54279.27	128593.12	182872.4	29.6815	70.3185
1998	56279.71	145081.38	201361.1	27.94965	72.05035
1999	61079.08	169458.84	230537.9	26.49416	73.50584
2000	62342.33	201581.06	263923.4	23.62137	76.37863
2001	64653.07	211894.79	276547.9	23.37862	76.62138
2002	64978.01	218237.62	283215.6	22.94295	77.05705
2003	67216.24	249688.64	316904.9	21.21023	78.78977
2004	79059.43	261846.53	340906	23.19098	76.80902
2005	72281.55	279348.06	351629.6	22.30012	78.59392
2006	81352.65	286716.46	364807.4	20.55616	79.44384
<b>Total</b>	<b>977493.36</b>	<b>2460404.6</b>	<b>3437898.1</b>		

Source: Various Statistical bulletins from the CBK & Researcher's Calculations based on the data

### Appendix III: Graphs of the Variables from 1968 - 2006

Figure A1: Trend in Deposit rate

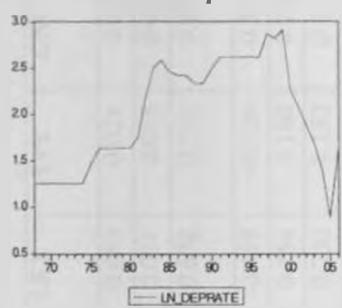


Figure A2: Trend in Exchange rates

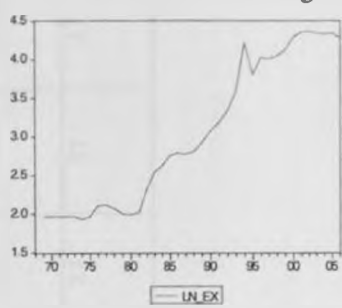


Figure A3: Trend in investment/Y-ratio

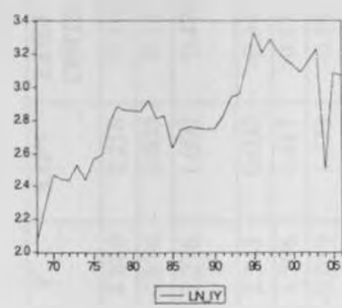


Figure A4: Trend in Real GDP

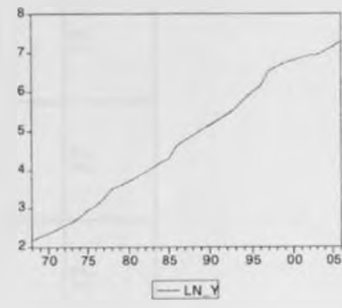
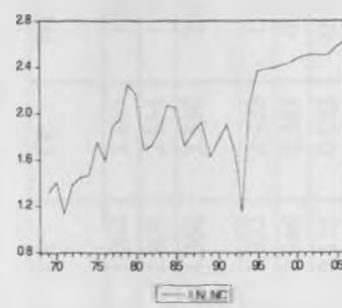


Figure A5: Trend in number of cheques cleared



## Appendix IV: Summary of Descriptive Statistics, Correlation matrix at levels and General Model Results

Table A5: Summary of Descriptive Statistics

	DEPOSITS	DEPRATE	EX	IY	NC	WY	Y	SAPS	LDEPOSITS	LDEPRATE	LEX	LIY	LNC	DLN_WY	LY
Mean	3.591	2.042	3.064	2.865	1.978	4.564	4.880	0.216	0.150	0.010	0.063	0.021	0.035	0.017	0.136
Median	3.467	2.180	2.805	2.854	1.928	4.551	4.876	0.000	0.131	0.000	0.031	0.015	0.038	0.005	0.121
Maximum	6.161	2.912	4.364	3.330	2.626	4.960	7.276	1.000	0.476	0.737	0.632	0.581	0.916	0.156	0.390
Minimum	0.718	0.888	1.932	2.433	1.135	4.329	2.343	0.000	-0.347	-0.656	-0.419	-0.726	-0.521	-0.007	0.015
Std. Dev.	1.683	0.573	0.946	0.262	0.425	0.130	1.596	0.417	0.132	0.233	0.154	0.180	0.249	0.032	0.071
Skewness	-0.049	-0.223	0.175	-0.033	-0.175	0.696	-0.019	1.379	-0.855	0.042	0.730	-1.152	0.585	2.825	1.734
Kurtosis	1.757	1.715	1.422	1.984	1.985	4.702	1.664	2.901	7.585	5.991	8.361	11.369	6.236	11.229	6.821
Jarque-Bera	2.396	2.851	4.029	1.597	1.778	7.448	2.756	11.737	36.912	13.800	47.604	116.156	18.253	153.612	41.045
Probability	0.302	0.240	0.133	0.450	0.411	0.024**	0.252	0.003*	0.000*	0.001*	0.000*	0.000*	0.000*	0.000*	0.000*
Observations	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37

Note: \*Reject hypothesis of normality at 1% level

\*\*Reject hypothesis of normality at 5% level

L – Denotes the Lagged variables

Where: DEPRATE - Deposit rate

EX - Exchange rate

IY - Investment Income ratio

NC - Number of cheques cleared

WY - ratio of monetary GDP to total GDP

Y - Income/real GDP

SAPs - Structural Adjustment programmes

Table A6: Correlation matrix at levels

	DEPOSITS	DEPRATE	EX	IY	NC	WY	Y	SAPS	LDEPOSITS	LDEPRATE	LEX	LIY	LNC	LWY	LY
DEPOSITS	1.000														
LDEPRATE	0.440	1.000													
EX	0.968	0.403	1.000												
IY	0.794	0.540	0.650	1.000											
NC	0.806	0.198	0.737	0.618	1.000										
WY	0.835	0.112	0.751	0.600	0.773	1.000									
Y	0.997	0.433	0.675	0.780	0.786	0.528	1.000								
SAPs	0.032	0.407	-0.003	-0.108	-0.349	-0.039	0.069	1.000							
LDEPOSITS	-0.055	0.175	-0.070	-0.020	-0.132	-0.043	-0.090	0.044	1.000						
LDEPRATE	-0.232	0.157	-0.292	-0.077	-0.225	-0.079	-0.249	0.021	0.510	1.000					
LEX	0.053	0.325	0.122	0.033	-0.176	-0.032	0.055	0.142	-0.022	0.051	1.000				
LIY	-0.127	-0.109	-0.072	0.261	-0.085	-0.053	-0.089	0.057	-0.365	-0.025	-0.054	1.000			
LNC	0.014	0.017	0.091	0.116	0.297	-0.018	0.010	-0.318	0.053	0.030	0.149	0.163	1.000		
LWY	0.210	-0.379	0.242	-0.010	0.218	0.484	0.220	-0.237	-0.004	0.042	-0.071	-0.005	-0.109	1.000	
LY	-0.033	0.332	-0.041	0.145	-0.094	-0.076	-0.031	0.195	0.292	0.275	0.065	0.229	0.059	-0.191	1.000

NOTE: L – Denotes the lagged variables

Where: DEPRATE - Deposit rate

EX - Exchange rate

IY - Investment Income ratio

NC - Number of cheques cleared

WY - ratio of monetary GDP to total GDP

Y - Income/real GDP

SAPs - Structural Adjustment programmes

Table A7: Unit root tests

Variable	ADF(2)*	Critical values		Order of integration
		1%	5%	
Deposits	-1.526	-2.94	-3.54	1(1)
Lagged deposits	-6.193	-2.94	-3.54	1(0)
Real GDP	-1.942	-2.94	-3.54	1(1)
Lagged real GDP	-6.916	-2.94	-3.54	1(0)
Deposit rate	-1.085	-2.94	-3.54	1(1)
Lagged deposit rate	-4.156	-2.94	-3.54	1(0)
Investment to GDP ratio	-2.269	-2.94	-3.54	1(1)
Lagged investment to GDP ratio	-7.761	-2.94	-3.54	1(0)
Monetary GDP to total GDP ratio	-0.299	-2.94	-3.54	1(1)
Lagged monetary GDP to total GDP ratio	-5.691	-2.94	-3.54	1(0)
Exchange rate	-2.146	-2.94	-3.54	1(1)
Lagged exchange rate	-6.859	-2.94	-3.54	1(0)
Number of cheques cleared	-2.939	-2.94	-3.54	1(1)
Lagged number of cheques cleared	-7.865	-2.94	-3.54	1(0)
Structural adjustment programmes	-1.710	-2.94	-3.54	1(1)
Lagged structural adjustment programmes	-6.819	-2.94	-3.54	1(0)

NOTE: (2)\* indicates the number of lags included when testing for the unit roots.



Table A8: General Model Results

Variable	Coefficient	t-Statistic
Constant	0.029	1.274
Deposit rate	-0.049	-1.006
Exchange rate	-0.043	-0.483
Investment to income ratio	0.565*	4.776
Number of cheques cleared	0.041	0.750
Monetary GDP to total GDP ratio	0.008	0.025
Income	0.803*	5.731
Structural adjustment programmes	0.003	0.157
Lagged deposits	0.142***	1.729
Lagged deposit rate	-0.034	-0.806
Lagged exchange rate	0.033	0.668
Lagged investment to income ratio	-0.595*	-6.348
Lagged number of cheques cleared	0.009	0.231
Lagged monetary GDP to total GDP	-0.084	-0.294
Lagged income	-0.019	-0.158
Adjusted R-squared		0.922
Akaike info criterion		-3.448
Schwarz criterion		-2.788
Durbin-Watson stat		1.792
F-statistic		30.491
Prob(F-statistic)		0.000

Note: \* significance at 1%      \*\* significance at 5%

Table A9: Cointegrating regression results

Variable	Coefficient	t-Statistic
Constant	0.029	1.274
1 <sup>st</sup> difference of the natural log of deposit rate	-0.049	-1.006
1 <sup>st</sup> difference of the natural log of exchange rate	-0.042	-0.483
1 <sup>st</sup> difference of the natural log of investment to income ratio	0.565*	4.776
1 <sup>st</sup> difference of the natural log of number of cheques cleared	0.039	0.750
1 <sup>st</sup> difference of the natural log of monetary GDP to total GDP ratio	0.008	0.024
1 <sup>st</sup> difference of the natural log of income	0.803*	5.730
2 <sup>nd</sup> difference of the natural log of deposits	0.141**	1.729
2 <sup>nd</sup> difference of the natural log of deposit rate	-0.033	-0.806
2 <sup>nd</sup> difference of the natural log of exchange rate	0.033	0.668
2 <sup>nd</sup> difference of the natural log of investment to income ratio	-0.595*	-6.348
2 <sup>nd</sup> difference of the natural log of number of cheques cleared	0.009	0.230
2 <sup>nd</sup> difference of the natural log of monetary GDP to total GDP	-0.084	-0.294
2 <sup>nd</sup> difference of the natural log of income	-0.019	-0.158
Structural adjustment programmes	0.003	0.157
Adjusted R-squared		0.922
Akaike info criterion		-3.448
Schwarz criterion		-2.788
Durbin-Watson stat		1.793
F-statistic		30.490
Prob(F-statistic)		0.000

Note: \* significance at 1%      \*\* significance at 5%

## Appendix V: Diagnostic tests Results

Table A10: Unit root test of the error correction term

ADF Test	-3.659888	1% Critical Value*	-4.2505
		5% Critical Value	-3.5468
		10% Critical Value	-3.2056

Table A11: Results of the Diagnostic Tests

Ramsey RESET Test:			
F-statistic	1.871608	Probability	0.174025
Log likelihood ratio	4.976668	Probability	0.083048

White Heteroskedasticity Test:			
F-statistic	2.014222	Probability	0.068821
Obs*R-squared	21.82817	Probability	0.112389

ARCH Test:			
F-statistic	1.094661	Probability	0.413241
Obs*R-squared	9.904319	Probability	0.358287

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.012361	Probability	0.464176
Obs*R-squared	11.99222	Probability	0.213748

Figure A6: Stability Test for Cumulative Sum of the Recursive Residuals

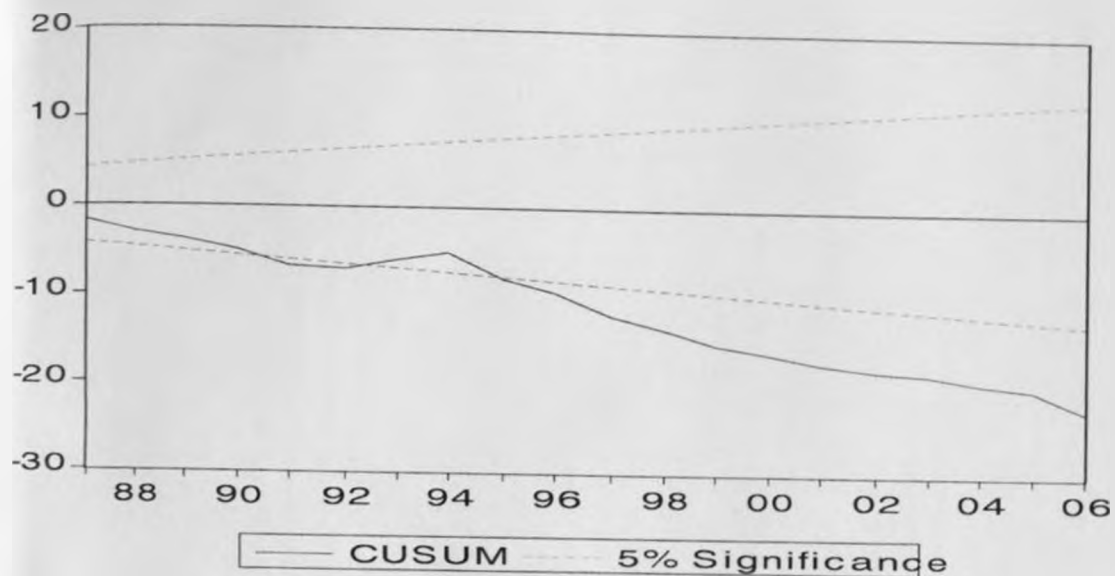


Figure A7: Results of the Normality Test for Model Residuals

