

**EFFECTS OF REAL INTEREST RATE ON THE FINANCIAL DEEPENING  
IN KENYA**

**OWUOR J. OUMA**

**D63/63812/2013**

**A MANAGEMENT RESEARCH PROJECT SUBMITTED IN PARTIAL  
FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER  
OF SCIENCE IN FINANCE (MSC) DEGREE, SCHOOL OF BUSINESS,  
UNIVERSITY OF NAIROBI**

**OCTOBER 2014**

## **DECLARATION**

I declare that this research project is my original work and has not been presented for award of a degree in any other University or learning institution.

Signed \_\_\_\_\_ Date \_\_\_\_\_

**OWUOR J. OUMA**

**D63/63812/2013**

This management research project has been submitted for examination with my approval as the University supervisor

Signed \_\_\_\_\_ Date \_\_\_\_\_

**MR.MIRIE MWANGI**

**Supervisor**

Department of Finance and Accounting

University of Nairobi

## **ACKNOWLEDGEMENT**

I am very grateful to God for life and everything that he has done to me and seeing me through this program.

Further I take this opportunity to acknowledge the immense contribution made by my lecturers who took me through the program and to my supervisor Mr. Mirie Mwangi who made sure I understood what I was doing and ensured the project is successful and the entire University of Nairobi School of Business postgraduate program.

I also acknowledge the Government of Kenya through the Ministry of Environment Water and Natural resources and the Defunct Ministry of Forestry and Wildlife more so to my former immediate Deputy Chief Finance Officer Madam Sarah Kerandi and the entire staff for giving adequate time to study and carry on with other duties and colleague Ms. Molonko who help me understand some basic concepts.

And last but not least my family members Mama Maslina, Onyango, Judy, Esnas, Mercy, Wesley, Nelisa, friends, classmates, workmate and all those people who helped me in one way or another I owe you a lot and may God continue to provide for you.

To you all I say thank you and may God bless each one of you.

## **DEDICATION**

To my parents who struggled to ensure we get enough and encouraged me to go to school and my family Esnas, Cindy, Wesley and Tamara for their endurance.

## ABSTRACT

Kenya has been implementing policies relating to financial deepening or financial development for many years from 1990s, this has seen the financial asset base of Kenyan economy increased significantly over the years. The objective of this study was to determine the effects of real interest rate on financial deepening in Kenya; the study used the quarterly time series data for the 40 periods of 2004-2013.

The study used money velocity M3 to Real GDP as a proxy for financial deepening (FD), regressed against real interest (INT) adjusted for Fisher's effect, fiscal and monetary policies (GP) measured on domestic borrowing proxied by real GDP and financial intermediation (FI) proxied by domestic credit to private sector against real GDP.

To answer the question that does real interest rate affects financial deepening in Kenya; the study found a strong positive relationship of 0.997211 exists between real interest rate, monetary and fiscal policy and financial intermediation. The Ordinary Least Square Method (OLS) was used in the study to capture the effects of real interest rate (INT), government policy (GP) and financial intermediation (FI) effect on financial deepening.

The results indicates that real interest rate and government policies have impact on financial deepening, while financial intermediation (FI) has little effect on financial deepening. The independent variables are able to explain 99.4% of the changes in the dependent variables as indicted by adjusted R-squared. The analysis of variable (ANOVA) statistics gave a p-value of 0.021 which is below the recommended  $p=0.05$ , this indicate that the variables are significant.

This implies that government policies and interest rate affects the financial deepening, therefore more attention should be given to policies government takes from time as they influence the financial development. Interest rate also has a positive impact on financial deepening; this outcome confirms other studies that real interest rate has effect on saving and investment.

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## **LIST OF ABBREVIATIONS AND ACRONYMS**

APR	Annual Percentage Rate
CBK	Central Bank of Kenya
DW	Durbin Watson Test of Significance
FD	Financial Deepening
FH	Fisher Hypothesis
GDP	Gross Domestic Product
IMF	International Monetary Fund
KNBS	Kenya National Bureau of Statistics
MFI	Micro- Financial Institutions
OLS	Ordinary Least Square
SSA	Sub-Saharan Africa
SPSS	Statistical Program for Social Sciences
UIP	Uncovered Interest Parity
US	United States of America

# CHAPTER ONE

## INTRODUCTION

### 1.1 Introduction to the Study

It is imperative to note that the aftermath of the recent economic melt-down which affected the known financially developed economies, leaving the developing and less developed economies less bruised World Bank (2013). The effect of the melt-down inflicted unknown suffering to million and million people across the globe, it also brought into sharp focus role of regulators in the financial arena and more so on private lending, which was the precursor of credit creation and eventual financial crisis. Mostly, policy makers and firm always seek finances from financial institutions to get credit to either finance their dream or expand their businesses, interest rate become one of the factors that economist, financiers and everyone in the economy consider.

Interest rate is the “rent” paid to borrow money, the lender receives a compensation for foregoing other uses of the funds including personal consumption. The original amount lent is called the principal and the percentage of the principal is paid or is payable over a period of time is the interest rate Thygerson (1995). Interest rate is the common denominator used by the commercial banks to derive their competitiveness as well as deriving the financial economy. For instance, several studies have found little evidence for the positive role of interest rate on economic growth because of its ambiguous impact on savings. Yet, there has been enormous support for the position that even though interest rates might not significantly affect the savings rate, they do influence economic growth through their effect on financial deepening Odhiambo (2008).

It will be noted that interest rate plays two important roles in macro-economic i.e. the Fisher hypothesis (FH) and uncovered interest parity (UIP). The Fisher hypothesis links nominal rates with the expected inflation which require full adjustments of these two variables in the long run and implying stationary of ex-ante interest rates (crucial variable for understanding investment and saving decisions as well as asset price determination. Further studies indicate increase in bank market power, bank size, staff costs among others factors significantly increase net interest margins, while increase in excess cash reserves and central bank lending rate decrease them Aboagye et al (2008). Another study on the impact of interest rate reforms and its effect on financial deepening and economic development in Kenya found a positive relationship, Ndungu (2000) and Odhiambo (2009), although the two studies used different approaches.

The study will be focusing on the effects of real interest rate on financial deepening in Kenya; the objective of the study will concentrate on the ability of the real interest rate to create financial development. It is a common knowledge that private lending is what shapes the economy of the world and drive the financial economy across the globe and where proper oversight is exercised it can produce multi-facet benefits in country's development agenda.

### **1.1.1 Real Interest Rate**

Interest rate is defined as the percent premium paid on money at one date in terms of money to be in hand one year later. Money is which can be traded as present and future; hence rate of interest is also known as cost of money or the price and the

market in which it is traded is known as money market Fisher (1930). According to Thygeson, (1998) interest rate is the “rent” paid to borrow money, the lender receives a compensation for foregoing other uses of the funds including personal consumption. The original amount lent is called the principal and the percentage of the principal is paid or is payable over a period of time is the interest rate

Radha (2011) define interest rate as the amount received in relation to an amount loaned, generally expressed as a ratio of dollars received per hundred dollars lent. However, a distinction should be made between specific interest rates and interest rates in general Sanya and Gaertner (2012). Specific interest rates on a particular financial instrument for example, a mortgage or bank certificate of deposit reflect the time for which the money is on loan, the risk that the money may not be repaid, and current supply and demand in the marketplace for funds available for lending Siddiqui (2012). Interest rate always changes as a result of inflation and Central Banks rates, it varies from bank to bank depending on asset, staff cost, market power among other factors Aboaagye et al, (2008).

A study of the impact of real interest rate of selected Asian economies, showed a support for the interest rate liberation, although it should be done in gradually Pradeep (2001). It will be noted that financial savings is only one type of saving, as interest rates goes up there may be substitution effects between financial assets and other assets leaving the total saving unchanged. There is a strong belief that higher interest rates can mobilize savings. In research by Gupta (1987) of 22 periods of developing Asian countries suggest that there is positive substitution effects on the real interest

rate on savings which dominate the income effects, the most important determinant is the real income.

Economic growth contributes to financial development by raising the demand for financial services; the income distribution is improved if poor segment of the population (poor entrepreneurs) have easy access to financial resources. A recurring question in economics is the extent to which monetary policy interventions affects the real economy of interest rate changes in GDP and households. In economists view monetary policy is critical in pushing for financial intermediation, as the policies determine the overall economic growth and financial access IMF (2009). Finally an increase in interest rate makes the cost of money more expensive and may crowd out private demand particularly when investments shows a significant sensitivity to changes in interest rate, this could lead to decrease on aggregate demands both directly through investments and indirectly through activities IMF (1999).

### **1.1.2 Financial Deepening**

Conceptually, financial depth is often understood to mean that; sectors and agents are able to use a range of financial markets for savings and investment decisions. Encompassing long maturities; financial intermediaries and markets are able to deploy larger volumes of capital and handle larger turnover, without necessitating large corresponding movements in asset prices (market liquidity); and the financial sector can create a broad menu of assets for risk-sharing purposes (hedging or diversification). In other words, deep markets allow savers to invest in a broad range of quality investment and risk-sharing instruments and allow borrowers to likewise tap a broad range of financing and risk management instruments (King and Levine,

(1993); Rajan and Zingales (1998); Chami, Fullenkamp and Sharma, (2009); Goswami and Sharma (2011).

Financial deepening is widely believed to confer important stability benefits to an economy, albeit with caveats. For instance, by increasing transaction volumes, it can enhance the capacity to intermediate capital flows without large swings in asset prices and exchange rates. But it can also attract volatile capital inflows, complicating macroeconomic management IMF (2011). It can lower the reliance on foreign savings and attenuate balance sheet mismatches by increasing the scope to raise funds in domestic currencies and at longer maturities World Bank (2011).

Deeper markets can provide alternative sources of funding during times of international stress, limiting adverse spillovers, as evidenced in the global crisis. At the same time though, deepening can occur too quickly, leading to credit booms and subsequent busts. It has also been argued that deepening can increase the capacity of emerging markets to generate their own safe or reserve assets, rather than to rely predominantly on U.S. treasuries Gourinchas and Rey (2005); Caballero, Farhi, and Gourinchas, (2008).

The term financial deepening is widely used by different economic development experts. It is an increased ratio of money supply to GDP or given price index. In other terms, it is an improvement or increase in the areas of financial services focused to all societal levels in any community. Role of financial deepening in the growth of financial processes of any country is very vital. Different studies have been conducted on financial deepening but mostly in the developed nations.



Thirwall, (1995) urge that financial deepening is undertaken by different groups and the process of capital formation is likely to require some form of finance and credit mechanisms to redistribute resources from savers to investors. The author further urged that monetary policy to encourage savings largely takes on the forms of development of financial intermediaries, which encourages production surplus to savers and further taking the risk out of savers lending directly to investors. In addition due to law of large numbers, financial intermediation are able to borrow short and lend long is advantageous due to liquidity, monetary policy may also encourage savings and encroach the unorganized money market. This in effect would encourage development of money market which would lower average interest rate thereby raising the level of savings.

McKinnon (1973) and Shaw (1973) have indicated that financial deepening and money economy for economic development has been around for some time now. They urge that holding money and capital accumulation are complementary in the development process. Financial deepening and effects of high interest rate encourages saving and discourages investments in low yielding projects, thus the increased liabilities of the banking system to give more resources to investments is more efficient. Financial deepening economists urge that the development of financial sector (financial deepening) and economic development are closely intertwined.

It is critical as urged by various development economist that a limited financial depth lowers welfare and hinders poverty alleviation and lack of credit in economy impedes growth. In a study on contemporary theory of financial intermediation, financial institutions possess superior capabilities in financial management which constitute

them as an inevitable part of overall economic system performance World Bank, (2007). Higher rate of growth is necessary condition for alleviating poverty in a market economy where major wealth or income redistribution may be difficult to achieve. Financial sector development involves the design and implementation of policies to intensify the degree of monetization of the economy through increase the access of financial services Pradeep (2001).

### **1.1.3 Relationship between Interest Rate and Financial Deepening**

Financial deepening according to Mc Kinnon (1973) and Shaw (1973) is the process of accumulation of financial assets more than non-financial assets; they believe that holding money and capital accumulation are complementary in the development process. Interest rate according to the two economist encourages saving and discourages investments in low yielding projects, in essence this means that the investments which have good prospect are likely to get more funds.

The financial sector plays important role in economic development of any nation, their role is seen as the driver of economic development as it also measure how a country is fairing among its peers. Interest rate has been seen to have effect on the financial development in the country by enlarging the number of borrowers and encouraging people to save Mc Kinnon (1973) and Shaw (1973). According to Gupta (1987) as the interest goes up there may be substitution effect between financial assets and other assets, because financial saving is only one type of saving, this will leave the total savings unchanged. Although there is a strong belief that higher interest rate will encourage savings, but the real income always supersede the real rate of interest.

Nyambura (2012) observed that there was improvement in the allocation of credits in the banks; the commercial banks developed a healthy money market and that the banks used indirect framework that allow the Central Bank to influence the general level of interest rates through open markets operation. The study concludes that there is a positive significant relation between market interest rate and market power and competition among the banks which is beneficial for financial deepening.

Thirwall (1995) urged that financial deepening is undertaken by different group and the process of capital formation is likely to require some form of finance and credit mechanism to redistribute resources from savers to investor. This is done through monetary policies to encourage savings by developing financial intermediaries, which encourages production surplus savers and further taking the risk out of savers lending directly to investors. Furthermore, the law of large numbers financial intermediaries are able to borrow short and lend long, this can in addition of providing ready capital for investments it can also can distort the operation of informal money market, thereby bring more people to formal financial system.

Fallah, (2012) observed that accumulation of non-performing loans results from a weak legal system and a poor business environment that squeezes the profit margin, and banks respond by increasing the lending rate. Policy actions also affect the spread. And also there is an asymmetric response is indicated with the foreign exchange rate where lending rates increase with the foreign exchange. The Central Banks responds to the widening gap in interest rate by publishing the interest rates on both deposits and lending that must be maintained by Commercial banks but in the absence of ensuring that factors that lead to the widening gap are addressed.

Studies are pointing out that monetary policies interventions affects the real economy through interest rate changes in GDP and households. Economic growth contributes to financial development by raising the demand for financial services; the income distribution is improved if poor segment of the population (poor entrepreneurs) have easy access to financial resources. A study to examines the impact of macroeconomic variables i.e. inflation, interest rate, exchange rate and money supply on the performance of shares founded that the four selected macroeconomic variables (Inflation, Interest rate, Money supply and exchange rate) do indeed impact on the financial performance of the share prices at the Nairobi stock Exchange Gekome, (2011).

#### **1.1.4 Financial Sector in Kenya**

Kenya Envisions to have a vibrant and globally competitive financial industry that will not only create jobs but also to promote high levels of saving to finance overall investment needs. Kenyan financial sector comprises of Banking, Insurance, Capital markets, Pension Schemes and Quasi-banking institutions such as: Savings and Credit Cooperative Societies (SACCOs); Microfinance Institutions (MFIs); Building Societies, Kenya Post Office Savings Bank (KPOSB); Development Finance Institutions; (DFIs) and informal financial services such as Rotating Savings and Credit Associations (ROSCAs). Financial intermediation in Kenya has continued to record high growth rates due to increased lending as reflected by the rise in domestic credit backed by significant financial innovation. Financial services are expected to play critical role in the next phase the county's development plan by providing better intermediation between saving and investments as stated in Kenyan Vision 2030.

Kenya financial sector is dominated by five large banks which account for the bulky of deposits. The remaining banks are small and have limited outreach. Kenya is under-insured with penetration level of about 1 % of GDP Kenya invest Authority, (2014).

## **1.2 Research Problem**

Financial deepening is critical for economic development in any country, however due to high interest rate it has become macroeconomic dilemma that has been difficult to eliminate, a higher interest rate has been cited as oppressor of economic development, while others urge that a higher interest increases savings and ensure that the economy has enough funds to invest in more promising investments. Central Banks have responded by instituting various monetary and fiscal stances either moving the interest rate up or down to strike the right code, the most recent is the APR and the benchmark banks interest rate(KBBIR) set as the baseline rate(CBK,2014).

Financial sector plays critical role in the development of money economy; it has been seen as a critical aspect in expansion of credit and provides the critical link between the savers and investors. This in effect means that with limited financial development, the risk element will be high due to lack of competition in the financial sector Eshaag (1983). To handle the credit risk due to distress borrowing and poor macroeconomic conditions banks and other financial institutions charge high premium on their interest rates. This in itself is draw back as it limits the economic growth of the country due to the high interest rates, the interest charged by these financial institutions are informed by inflation, real interest rate, policy of the government and their internal cost of operations.

Various studies have also been carried out investigating the effect on interest rate and financial deepening Odhiambo (2005), Odhiambo (2008), Ngungi and Ndungu, (2000) including the Sub Saharan Africa, developing and developed countries; the resultant conclusion has not been very clear due to the very nature of interest rate. In Kenya there are quite a good number of studies on the effects or the relationship between financial deepening and interest rate including the most recent by Bundi (2013), the fundamental issue or concern in economic growth that most researchers looks for is solution to various economic problems facing masses. A gain, the efficiency of all financial markets in enhancing financial deepening and savings initiatives of financial resources has not been fully researched on and there still exist gaps in policy, research works and market participants this in itself makes a great drawback in financial deepening. Furthermore; given the low penetration of the formal financial services especially among the rural forks and the resultant large demand for financial services by this section of population that is unbanked, this further bolster the suggestions that there is still exist knowledge gap which this study will try to answer.

However, the status of government interventions in financial market in most developing countries hinders the great potential of all financial and money markets in increasing mobilizing savings that would lead to better growth and development. In this regard a number of studies have been carried out in Sub-Saharan Africa which indicates that there is still low financial access and that interest rate has been found to have impact on the economic growth of developing countries Odhiambo (2009).

While the above research outcomes provide the valuable insight on interest rate and financial deepening, the researcher would like to add on to the body of knowledge on interest rate effects and financial deepening. Again due to non conclusive nature of these studies it became imperative to study the effects real interest and financial deepening in Kenya and private saving. From these studies including others, there exist research gap which beg the question which this study would seek to answer is that does real interest rate affects financial deepening in Kenya?

### **1.3 Objective of the Study**

The objective of this study is to determine the effects of real interest rate on the financial deepening in Kenya.

### **1.4 Value of the Study**

This study will be useful in a number of ways; the financial system in the country is seen as a moving vehicle for promoting economic growth in the country. Most of effective financial institution helps to identify the most efficient and effective investment ventures and distributes resources from all financial savers into real investors. It also helps borrowers to manage available risks and operates the payment and settlement system bearing interest rate in mind. The study shall further assist researchers and students of banking and finance in gaining an understanding of the effects of interest rate influence on financial deepening in emerging economies.

Financial deepening of a country helps reduce poverty level through access and development of those financial products and efficient financial system which is crucial to macroeconomic stability. The study will be significant in providing

empirical investigation on the effects of interest rate on the financial deepening thereby filling the existing gap in the literature as it relates to the subject matter and Kenyan situation. Finally it will assist Commercial banks investment managers and policy makers understand the influence of interest rate on investments choices in emerging economies.



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

This chapter will give insight into the literatures as done by various scholars in the areas interest rate effects and on the financial deepening.

#### 2.2 Theoretical Review

##### 2.2.1 Irving Fisher Theory

Fisher, (1930) in Irving Fisher's theory of capital and investment was introduced in his Nature of Capital and Income (1906) and Rate of Interest (1907), although it has its clearest and most famous exposition in his Theory of Interest (1930). In his theory, Fisher assumed that all capital was circulating capital and that capital is used up in the production process, thus a stock of capital  $K$  did not exist. Rather, all capital is, in fact, investment. Given that Fisher's theory output is related not to capital but rather to investment, then we can posit a production function of the form  $Y = (N, I)$ . Now Fisher imposed the condition that investment in any time period yields output only in the next period. Holding labour  $N$  constant, then the investment frontier can be drawn as the concave function.

Irving Fisher's theory of interest rates relates the nominal interest rate  $i$  to the rate of inflation ( $\pi$ ) and the "real" interest rate ( $r$ ). The real interest rate  $r$  is the interest rate after adjustment for inflation. It is the interest rate that lenders have to have to be willing to loan out their funds. The relation Fisher postulated between these three rates is  $i = r + \pi(1+r)$ , according to this equation if  $\pi$  increase by 1 percent the nominal

interest rate increases by more than 1 percent and if  $\pi$  and “ $i$ ” are known then  $r$  can be determined, therefore the final equation would be  $r = (i - \pi) / (1 + \pi)$  William and Dennis, (1996).

### **2.2.2 Keynes’s Liquidity Preference Theory of Interest Rate**

According to Keynes (1936) interest is purely a monetary phenomenon because rate of interest is calculated in terms of money. It is a monetary phenomenon in the sense that rate of interest is determined by the supply of and demand for money, Keynes defined interest as the reward for parting with liquidity for specified time.

Keynes (1936) in his epoch-making book the General Theory of employment, Interest and Money, has put forward a new theory called Keynes liquidity preference theory of interest. According to him “Interest is not the price for waiting. It is not the remuneration necessary to call forth saving because a man may save money, bury it in his backyard and get nothing from it in the way of interest. Interest is the reward for surrendering liquidity, i.e. a reward for dispensing with the convenience of holding money immediately available”. Interest is, thus, the reward for parting with liquid control over cash for a specific period, or we say, “Interest is the payment for parting with the advantages of liquid control of money balance”. He further states that there are three components of money, which determine the interest rate returns these are transaction motive, precautionary motive, and speculative motive symbolically written as  $L^1 = F(y)$ .

As transaction and the precautionary motives for holding cash depend upon income, as they are income elastic, Keynes has put them together. It is expressed in

symbols  $L^2 = F(y)$  which means that the liquidity preference on account of the two motives called  $L^2$  is a function of income Keynes (1936).

The speculative motive relates to the desire of the households and firms to keep a portion of their resources in ready cash in order to take advantage of changes in the interest rates. If people expect a rise in the rate of interest in the future, they will try to hold money in cash in order to lend it in the future. Conversely, if they expect a fall in the rate of interest, they will at once like to invest money now in order to avail themselves of the advantages of high rate of interest. Thus, we find that an expected rise in rate of interest stimulates liquidity preference and an expected fall has the opposite effect. Symbolically written as  $L^3 = F(r)$ . The liquidity preference for speculative demand for money is a function of expected changes in the rate of interest Keynes (1936).

### **2.2.3 Modern Theory of Interest Rate**

Neo-Keynesian economists like Hicks (1939), Lerner (1943) and Hansen in 1941 are of the opinion that loanable funds formulation and the Keynesian liquidity preference formulation taken together do supply an adequate theory of the rate of interest. The Modern Theory of Interest rate is designated 'as IS-LM Curves Model. Hicks, Hansen's IS-LM curves model seeks to explain a case of joint determination of equilibrium rate of interest ( $r$ ) and equilibrium level of income ( $y$ ). This theory is designed to explain the joint determination of equilibrium rate of interest ( $r$ ) and equilibrium level of income ( $y$ ) by the interaction of the commodity market and money market.-Since IS curve and LM curve indicate equilibrium in the commodity market and equilibrium in the money market respectively, so the intersection of IS

curve and LM curve shows the simultaneous equilibrium in both the commodity market and money market with equilibrium rate of interest  $r$  and equilibrium level of national income ( $y$ ).

In all the three, factors which exercise powerful influence on the people's desire to hold money. The first two factors, *i.e.* the transaction motive and the precautionary motive are not very much influenced by; the changes in the rate of interest, but the third factor, *viz.* speculative motive is very sensitive to the changes in the interest rate. The major portion of money which people want to hold in the form of cash is meant for speculative purposes. When the rate of interest in a community is high, people hold less money in the form of cash because by lending it to other, they earn a sufficient amount of money. Conversely if the rate of interest is low, people will not be very anxious to lend money.

#### **2.2.4 The Austrian or Agio Theory of Interest**

The Austrian or Agio Theory of interest was first advanced by Rao in 1834 and later on, it was developed by the Austrian economist, Bohm-Bawerk (1959). According to him, interest is the premium or Agio which present goods command over future goods. The reason as to why present goods are preferred over future goods are as follows firstly, future is shrouded in mystery and so is uncertain. Secondly, present wants are more urgently felt than the future ones. Thirdly, present goods possess a technical superiority over future goods. Keeping in view all the conditions stated above, an individual prefers present satisfaction to a future satisfaction.

However the theory is criticized on the following points. It attaches too much importance on the supply side of the problem and ignores the demand side. The

theory does not throw light as-to how the rate of interest is determined. It is also pointed out that interest is not paid merely because the lender must be induced. The interest is paid because the borrowers are willing and able to pay the loan, Investopedia staff (2014).

## **2.3 Determinants of Financial Deepening**

Shaw (1973) and McKinnon (1973), refers to the financial liberalization as the virtue of the fact that a prominent aspects in the accumulation of financial assets at a faster pace than accumulation of non-financial assets, the latter also referred to it as a movement towards financial liberalization. The opposite of financial deepening is financial repression; the various scholars also conferred to it the same name and meaning.

### **2.3.1 Monetary and Fiscal Policies**

The advocates of financial deepening states that forced savings through government budget deficit that causes inflation is a necessary result of selective intervention, the essential feature of financial deepening is said to be freedom of interest rate movement without regulation and absence of discriminatory taxes, subsidies or regulations of any kind among industries including foreign investors, allowing exchange rate to settle at the point in which demand and supply are balanced Eshaag (1983).

Panicos and Luintel (1996) contend that with the exception of a lending rate ceiling, other controls are found to influence financial deepening negatively, independently of the well known effect of the real interest rate. Exogeneity tests suggest that financial

deepening and economic growth are jointly determined. Thus, policies which affect financial deepening may also have an influence on economic growth.

Neoclassical theorist of saving assumption that rise in the rate of interest would have a significant positive effect on private propensity to save and vice versa is doubtful validity Eshag (1983). The propensity to save is determined by a large number of factors of which interest rate plays minor role. According to Keynes (1936), since saving is equal to national income less consumption, it follows that measures which will succeed in restraining growth of government consumption without at the sometime retarding the growth of production will also raise the share of saving in the national income.

### **2.3.2 Interest Rate**

Financial depth and economic development are intertwined and various studies have shown that interest rate in the long run affects financial depth and by extension economic growth as was found by Odhiambo (2009) in his study on the economic development of a country, interest rate reforms, financial deepening and economic growth in Kenya. The study used the financial deepening model and the dynamic G granger causality model. The study, therefore, concludes that the interest rate liberalization in Kenya has succeeded in increasing economic growth through its influence on financial depth. The exact theoretical relationship between the rates of interest and returns on the stocks or economic development is determined by the spread of interest over a given period of time.

Era et al (2014) urge that financial deepening impacts growth and equality in three channels, a more developed financial market allows to channel more funds to entrepreneurs and increase their output, more efficient financial contracts limits the resources wasted due to friction and leads to growth and efficient allocation of funds in the financial system brings an increase in total factor productivity. This is because talented agents increase the scale of production which brings a higher equilibrium wages and interest rate, crowding out inefficient and untalented agents out of business.

The financial deepening ratio (proxied by the ratio of broad money to GDP) generally increases with higher real interest rates and with real currency depreciation, suggesting that at least some of the assets coming to the banking system in response to higher interest rates could be at the expense of foreign assets held by domestic residents. This implies that higher real interest rates are likely to increase investment ratios Pradeep (2001).

### **2.3.3 Financial Intermediation**

In a study by Kheswar (2006) the author made an attempt to test for the effects of financial repressionist policies on financial deepening and economic development in the case of Mauritius. Using the method of principal components, direct measures of banking controls are constructed and used in estimating financial depth and economic growth equations. The study found no significant evidence that some form of financial repression has contributed to financial depth and economic growth. Instead, the results confirmed that banking controls have inhibited financial sector development in Mauritius, which is in line with the financial repressionist literature.

Moreover, it is found that non-interest factors such as bank branches have promoted the rapid growth in bank deposits even during the period of financial repression. There is also a two-way relationship between banking sector development and economic growth in the economy. The major policy implication is that the pursuit of financial liberalization and banking sector development is no doubt a right strategy to achieve higher economic growth.

Aduda and Kalunda (2012), in their paper on financial inclusion which include both access and usage concluded that access and usage are not the same but supplementary, therefore more need to be done on financial inclusion as access and usage are critical in financial development and this should compass even informal financial services. Bundi (2013) who investigated the financial liberalization on domestic saving concluded that interest rate liberalization together with credit control elimination have a negative effect on private domestic saving. Opening of financial sector to foreign investors was found to positively affect private domestic savings. This implies that financial liberalization has worked only through financial intermediation. The results of the study therefore suggest the need to formulate policies to change the negative influence of real deposit interest rate to positive influence and promote financial deepening.

According to Eshag (1983) a higher interest rate will also mean that it will be above inflation, these are the rate at which all available capital is wanted and reflect the demand and scarcity of capital. Individual savers will also feel their savings are safe. Allow real interest rate will not have effect on savings, they also urge that the net capital exportation will be reduced and expansion of private credit will also be achieved



Kheswar (2006) in a study of banking controls, financial deepening and economic growth in Mauritius, found out that there is no significant evidence that some form of financial repression has contributed to financial depth and economic growth. Instead, the results confirmed that banking controls have inhibited financial sector development in Mauritius, which is in line with the financial repressions literature. Moreover, it is found that non-interest factors such as bank branches have promoted the rapid growth in bank deposits even during the period of financial repression.

## **2.4 Empirical Review**

Quite a number of studies have been carried, depicting interest rate and financial deepening across the globe. Previous researches were conducted to study the relationship between financial deepening and interest rate effects, spread, impact on firm performance among other areas.

The arguments are based on theoretical and analytical framework developed by McKinnon (1973) and Shaw (1973), in their view repressed financial sector interfere with economic development in many ways including, discouraged investments due to poor financial policies, secondly savings is hindered and therefore returns on savings is either negative or unstable. They further urge that financial intermediations who collect savings do not distribute them efficiently. McKinnon (1973) and Shaw (1973) conclude that this process leads to financial repression through artificial credit rationing.

In a local scene a study carried out by Oshikoya (1992), on interest rate liberalization, savings, investment and growth in Kenya found that the empirical evidence for Kenya

provides only mild support for the beneficial effects of interest rates liberalization. At the micro level, interest rates deregulation has intensified competition between commercial banks and non-bank financial institutions, has increased financial intermediation cost, and has produced positive real interest rates structure. Nevertheless, the macroeconomic uncertainties and turbulence of the 1980s seem to have much greater impacts on financial deepening, savings, investment, and growth in Kenya during the period of interest rates liberalization.

Oshikoya (1992) further urged that on savings function for Kenya showed a significant positive impact of the real interest rate, after controlling for terms of trade effects and the effect of financial repression on the functional form of the equation. The Author lamented that previous studies failed to find this impact because they did not pay due attention to this latter effect. The theoretical underpinnings of this model stress the role of the implicit interest that banks have to pay on deposits when the (explicit) real interest rate is negative. This explains why deposits do not fall to zero in such a case. The model shows that the savings rate in Kenya could have been much higher than it was in the 1970s, had the real interest rate been simply zero instead of being negative.

Kariuki (1995) did a study on the impact of interest rate liberalization on financial savings in Kenya; found out that the evidence fails to lend support to the theorized positive relationship suggesting that financial savings were not significantly responsive to real deposit rates in Kenya. In view of this, an explanation is offered in terms of the influence exerted by other factors. There is evidence that some fiscal policies and the depreciation of the shilling in the 1980s could have interfered with

the incentive effects of higher deposit rates. In addition, other non-economic factors such as the accessibility and appropriateness of banking services emerge as important. The overall conclusion is that although positive real deposit rates are necessary, they are not sufficient on their own to increase deposit mobilization by financial institutions.

James and Chai (1998) who did a study on financial liberalization and financial depth in China, the finding was that over the period 1978-1996, financial depth has been strongly influenced by real GDP per capita and the real interest rate. An error correction model (ECM) derived from the model reveals that the real rate of interest is a particularly important factor in explaining short run fluctuations in financial depth.

Developing economies are characterized by financial repressions, which mean that the government and central banks distort the operations of financial markets. This include ceiling of nominal interest rate, imposition of capital reserves, limiting their ability to lend. Moreover well developed financial system especially financial intermediation is also important for the effective allocation of capital between competing uses and ensures saving is used for investment purposes Thirwall (1995). Effects of interest rate movement can be said to have double edged impact, in that it can motivate saving due to attractive interest given on deposits and thereby mopping the idle money with individual and also scare away investments as high interest rate can limit access to finance due to high cost of borrowing, however its effect on the short-run cannot reliably established according to various studies.

Hunte and Bryant (1999), using a modified money supply and demand model, the study found that financial deepening, defined as  $M2/GDP$ , is positively influenced by

the marginal propensity to save and is inversely related to money velocity. Financial deepening is enhanced when savings increase, while saving-propensities modify the effects of monetary policy when required reserves change. The evidence indicates that financial deepening has been mixed. In some countries, financial deepening increased; in other countries it decreased or no conclusive evidence was observed. In addition, there has been the presence of high reserve-saving ratios, pervasive inflation, negative real rates of interest and depreciating currencies that contributed to the difficulties in Latin American financial markets. By the 1990s, however, monetary policy changed, resulting in an over-all decline in the reserve-saving ratio, indicating a less intrusive role for monetary policy in the 1990s than in previous decades.

Pradeep (2001) presented an empirical investigation of the impact of real interest rates and real exchange rates on financial deepening in four Asian countries, South Korea, Malaysia, Thailand, and Indonesia. The financial deepening ratio (proxied by the ratio of broad money to GDP) generally increases with higher real interest rates and with real currency depreciation. Foreign assets seem to have become important in the East Asian countries (except Malaysia), suggesting that at least some of the assets coming to the banking system in response to higher interest rates could be at the expense of foreign assets held by domestic residents. This implies that higher real interest rates are likely to increase investment ratios in these economies. These results support a policy of interest rate liberalization, although this ought to be done in a controlled and gradual fashion to minimize the potential for financial distress.

The local, regional and global perspectives have been carried out by Odhiambo, (2005); his paper examines the impact of financial liberalization proxied by interest rate on financial deepening in three sub-Saharan Africa countries - Kenya, South

Africa and Tanzania. Using cointegration and vector error-correction model, the study finds abundant support for the positive impact of real interest rate on financial deepening in the three study countries. The deposit rate in the financial deepening function is found to be positive and statistically significant in Kenya, South Africa and Tanzania. The results also confirm that the coefficients of the real GDP and the lagged value of the financial depth in the financial deepening function are positive and statistically significant as expected in all the three study countries. The study therefore concludes that positive real interest rates, which result from financial liberalization, unambiguously lead to financial deepening. The finding of this study lends more support for the positive role of financial liberalization on economic growth in the study countries.

Kayotaki and Moore (2005); the authors developed a model of financial deepening, based on the distinction between limited bilateral commitment and limited multilateral commitment. They explored the effects of secular changes in financial depth on investment and output; on intermediation and interest rates; on the long-run velocities of circulation of different monetary instruments, and the use of outside money; on the patterns of saving and trade in paper.

Kheswar (2006) the author made an attempt to test for the effects of financial repressionist policies on financial deepening and economic development in the case of Mauritius. Using the method of principal components, direct measures of banking controls are constructed and used in estimating financial depth and economic growth equations. We found no significant evidence that some form of financial repression has contributed to financial depth and economic growth. Instead, the results confirmed that banking controls have inhibited financial sector development in

Mauritius, which is in line with the financial repressionist literature. Moreover, it is found that non-interest factors such as bank branches have promoted the rapid growth in bank deposits even during the period of financial repression. There is also a two-way relationship between banking sector development and economic growth in the economy. The major policy implication is that the pursuit of financial liberalization and banking sector development is no doubt a right strategy to achieve higher economic growth.

Odhiambo (2008); the author looked at the impact of interest rate reforms on financial deepening and savings in Tanzania is examined using two models, namely the financial deepening model and the savings model. Using cointegration and error-correction techniques, the empirical results of this study revealed that there is abundant support for the positive impact of interest rate reforms on financial deepening in Tanzania. Likewise, the study finds financial deepening, which results from interest rate reforms, to have a positive influence on domestic savings. However, the study failed to find any strong support for the direct positive interest rate elasticity of savings in Tanzania.

Odhiambo (2009) the paper examines the impact of interest rate reforms on financial deepening and economic growth in Kenya, using two models: the financial deepening model and the dynamic granger causality model. The study attempted to answer two critical questions: Does interest rate liberalization in Kenya have any positive influence on financial deepening? Does the financial depth which results from interest rate liberalization lead to economic growth? Using cointegration and error-correction models, the study found strong support for the positive impact of interest rate liberalization on financial deepening in Kenya - although the strength and clarity of its

efficacy is sensitive to the level of the dependency ratio. The study also finds financial depth to Granger cause economic growth in Kenya. The study, therefore, concluded that the interest rate liberalization in Kenya has succeeded in increasing economic growth through its influence on financial depth. This applies irrespective of whether the models are estimated in a static long-run formulation (cointegration model) or in the dynamic formulation.

The evidence available at local level is varied and non-conclusive. However, there is strong evidence that in the long run interest rate have effect on the financial deepening, regionally especially Sub-Saharan Africa (SSA), also indicate some positive effects of interest the same view is shared in emerging economies more so Asian countries who also have close or similar financial growth character.

Studies carried out on Interest rate pass-through in Kenya by Nyamongo et al, (2011), found out that there is incomplete pass-through of policy rates both in the short and the long run. The study also shows that it takes approximately between 11 months to two years for policy interest rate to be fully transmitted to long-term rates, in essence any policy direction on interest rate change take close to one year to have its full effect.

A study on the relationship monetary policy and performance of NSE 20 share index found out that the variable had some impact on the performance of the NSE 20 share index with a strong adjusted R, furthermore the NSE 20 Share index was found to be positively correlated with money supply M3, repo rate, cash requirement and CBR rates and negatively correlated with 91 day Treasury bills rate and exchange rate Mwanza (2012). Another study done to find the relationship between stock market

and economic growth, revealed that there was a positive relationship between stock market development indices and economic growth in Kenya Owiti (2012).

The most recent study found out there is a positive relationship between stock returns and underlying inflation, overall inflation, economic growth, interest lending rate. in addition there is a negative relationship between stocks and exchange rate, therefore the real determinants of performance of stocks are exchange rate, economic growth and overall inflation Mwangangi (2013). Private equity firms' performance returns on investments are influenced by inflation, GDP growth rate, banks lending rate, exchange rate and systematic risk Njau (2013).

Aduda and Kalunda (2012), in their paper on financial inclusion which include both access and usage concluded that access and usage are not the same but supplementary, therefore more need to be done on financial inclusion as access and usage are critical in financial development and this should compass even informal financial services. Bundi (2013) who investigated the financial liberalization on domestic saving concluded that interest rate liberalization together with credit control elimination have a negative effect on private domestic saving. Opening of financial sector to foreign investors was found to positively affect private domestic savings. This implies that financial liberalization has worked only through financial intermediation. The results of the study therefore suggest the need to formulate policies to change the negative influence of real deposit interest rate to positive influence and promote financial deepening.



## **2.5 Summary of Literature Review**

The empirical evidence has provided mixed view for the effects of interest rate on the financial deepening based on McKinnon (1973) and Saw (1973) point of view on the role of money in the economy. Panicos and Luintel (1996) found that with the exception of a lending rate ceiling, these controls are found to influence financial deepening negatively, independently of the well known effect of the real interest rate. Exogeneity tests suggest that financial deepening and economic growth are jointly determined. Thus, policies which affect financial deepening may also have an influence on economic growth.

James and Chai (1998) financial liberalization and financial depth in China, the finding was that over the period 1978-1996, financial depth has been strongly influenced by real GDP per capita and the real interest rate. An error correction model (ECM) derived from the model reveals that the real rate of interest is a particularly important factor in explaining short run fluctuations in financial depth.

Interest is still important in an economy and for the performance of many commercial banks and other financial institutions. Apart from interest rate it appears from the literature that there are other factors which are still relevant in determining the financial deepening. Ndungu (2000), found out that a policy issue affecting interest take atleast 1 year for its effect to be detected in the economy, this explain the reason why interest effect can take a long time before its effects is felt in the real economy.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter presents a discussion of the research methodology that was employed to address the research questions. It covers the overall methodology which was used in the study, the research design, population, sampling design, and data collection methods and data analysis.

#### **3.2 Research Design**

Research design is an outline of the plan used to generate answers to the research problem. A descriptive and analytical research design was adopted in this study, because it explores the effect between variables.

#### **3.3 Data Collection**

The study used secondary data from Kenya National Bureau of Statistics and Central Bank of Kenya for 40 periods starting from first quarter of 2004 to the fourth quarter of 2013. The data relating to inflation was obtained from KNBS and nominal interest rate will be obtained from CBK for all the same periods under study. Quarterly GDP was obtained from KNBS, while the broad money velocity M3 and branch network of banks and financial institution was obtained from published quarterly CBK reports. The data relating to domestic debt for the government was obtained from the National Treasury for the same period. The periods are forty divided (2004 –2013). Data was obtained from the reports of the CBK reports and KNBS statistical abstract for the period (Appendix I).

### **3.4 Data Analysis**

The data that was collected were quantitative in nature. Since the study sought to establish the effects of interest rate on financial deepening, a regression analysis was used to help in finding out how interest rate affects financial deepening and its effect on domestic saving.

Quantitative analysis was carried out using ordinary linear regressions as was postulated by King and Levine (1993). Adopting Levine (2000) modified standard growth regression equation.

#### **3.4.1 Analytical Model**

Independent variables are used to predicts a given dependent variables, in line with the objective of effects of interest rate on financial deepening.

The regression models used is in the study is informed by the  $Y = \beta + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \mu$ . This model was used by Kiyotaki and Moore (2005), to study financial deepening in developing countries.

#### **Where**

**Y** is the dependent variable,  $\beta$  is the equation constant,  $\beta_1$ ,  $\beta_2$ ,  $\beta_3$  are the coefficient of explainable variables,  $X_1$ ,  $X_2$ ,  $X_3$  are independent variables and  $\mu$  is the error term.

Financial deepening is equivalent to broad money velocity, which is M3 divided by the Gross Domestic Products  $FD = M3/GDP$ . Financial deepening is the dependent

variable was regressed against interest rate, the policies on monetary and fiscal policies and the intermediation.

The real interest rate was informed by the CBK rate, which was taken to be nominal interest rate ( $i$ ),  $r$  which is the real interest will be  $r = (i - \pi) / (1 + \pi)$ , where “ $i$ ” is the nominal interest rate,  $\pi$  is the inflation rate according Fisher’s hypothesis. The study has used monetary and fiscal policies has been determined by the government domestic debt from the government budgets and financial intermediation. Private credit is the credit to the private sector by commercial banks. Private credit is a broader measure of financial intermediation since it represents a more accurate role of financial intermediaries in channeling funds to private market participants. The rationale for the variable inclusion is to test whether liquidity and borrowing constraints are important in explaining savings behavior as was explained by Ngugi, (2000).

The equation is as follows;  $FD \sum (INT, GP, FI) = 0$ , The equation as derived from the formula will be  $FD = \beta_0 + \beta_1 INT + \beta_2 GP + \beta_3 FI + \mu t$

**Where:**

**FD** is financial depth regressed against interest rate (INT), monetary and fiscal policies (GP) and financial intermediation (FI). Financial Deepening (FD) is broad money velocity, which is M3 divided by the Gross Domestic Products;  $FD = M3 / GDP$ .

**B0** is the value of the dependent variable when independent variable is zero.

**$\beta_1$ ,  $\beta_2$  and  $\beta_3$**  is the regression coefficient or risk factor which can influence the constant positively or negatively

**$\mu t$**  is the random disturbance term

**INT** is the real interest rate mirrored by,  $r = (i - \pi) / (1 + \pi)$ , where 'i' is the nominal interest rate,  $\pi$  is the inflation rate according Fisher's hypothesis.

**FI** is the financial intermediation is mirrored by the ratio of private credit ratio of real Quarterly GDP.

**GP** is the monetary and fiscal policy is annexed by the domestic debt in relation to Quarterly GDP

To determine value of  $\beta_0$ ,  $\beta_1$ ,  $\beta_2$  and  $\beta_3$  the study will use the Ordinary Least Square (OLS) technique.

### **3.4.2 Test of Significance**

The researcher used the Analysis of Covariance (ANCOVA) model to test for significance of the regression model. The "R squared" statistic at 0.05 level of significance was used to measure the fitness and validity of the model

## CHAPTER FOUR

### DATA ANALYSIS, RESULTS AND DISCUSSION

#### 4.1 Introduction

This chapter presents the data analysis, results, interpretation, and discussion of the research findings. To achieve the objective of the study, SPSS Version 19 statistical software was used to analyze the data. Linear regression was used to establish the relationship between lending interest rates and financial performance of commercial banks in Kenya.

#### 4.2 Data Analysis and Findings

The study seeks to determine the effects of real interest rate on financial deepening in Kenya. In this study a total of 40 periods starting from 2004 quarter 1 to fourth quarter of 2013. The references included websites CBK 91 days Treasury bills and the CBR rate and quarterly survey of branch network of the financial institutions including Forex Bureau and quarterly economic surveys carried out by Kenya National Bureau of Statics on Velocity of Money M3 and public debt and GDP.

#### 4.3 Descriptive Statistics

**Table 4.1: Descriptive Statistics**

<b>Variable</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Observations</b>
INT(Percentage)	-1.0691	4.8543	-14.6303	4.7719	40
FI(Kshs B)	1.030523	0.227564	0.0000	1.838571	40
GP(Kshs B)	1.611029	0.523776	1.03004	2.69276	40

**Source: Authors own computation using SPSS**

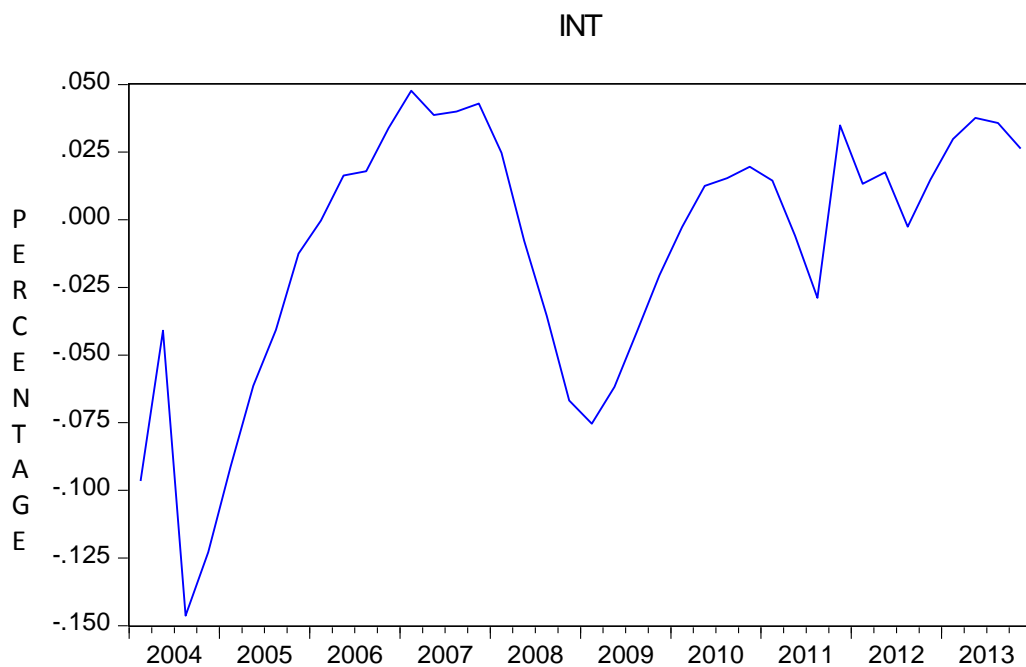
INT is the real interest rate

FI financial deepening

GP is the domestic debt as proxy of government policy

Table 4.1 presents the descriptive statistics for the data set. Three variables namely, INT, FI and GP with 40 observations each were used in the analysis. INT had a mean of -1.069% and a standard deviation of 4.85%. Its minimum value was -14.63% and maximum value was 4.77%, GP had a mean of 1.61 and a standard deviation of .52. Its minimum and maximum values are 1.03 and 2.69 respectively and finally the FI had its mean at 1.03, standard deviation was at .23. It had its minimum and maximum values at 0 and 1.84 respectively.

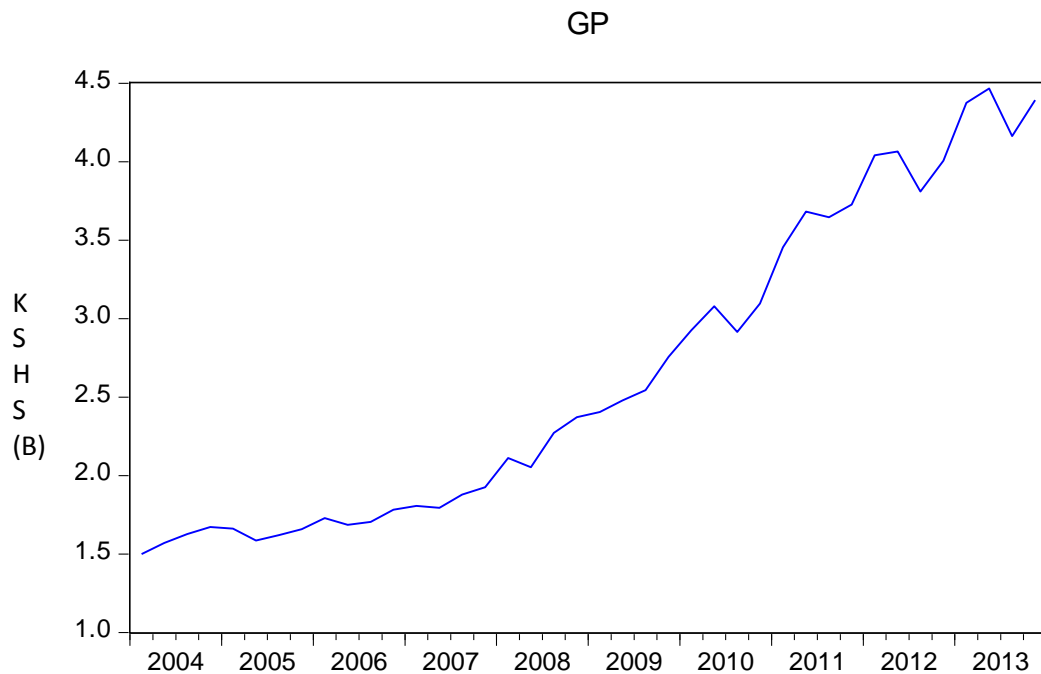
**Figure 4.1: Graphical Presentation on the movement of Interest over the period**



**Source: Authors as per SPSS on raw data**

The figure 4.1 shows the fluctuation of real interest rate after adjusting for fisher effect. It can be seen that between 2004 and 2005 there was a generally negative interest the figure went up in 2006 when it recorded the highest positive of 4.9% real interest, it should be noted that in 2007 the real interest rate went down this can be attributed to the election period when the country had economic shock due to post election violence. From mid 2008 the figure went up showing economic recovery. The real interest rate is seen to react to both political and economic pressure in 2010, in the third quarter shows decrease of real interest rate this is attributed to the new constitution and after which the economy registered a positive interest rate upto the end of 2013.

**Figure 4.2: Graphical Presentation on the movement domestic debt against the quarterly real GDP**

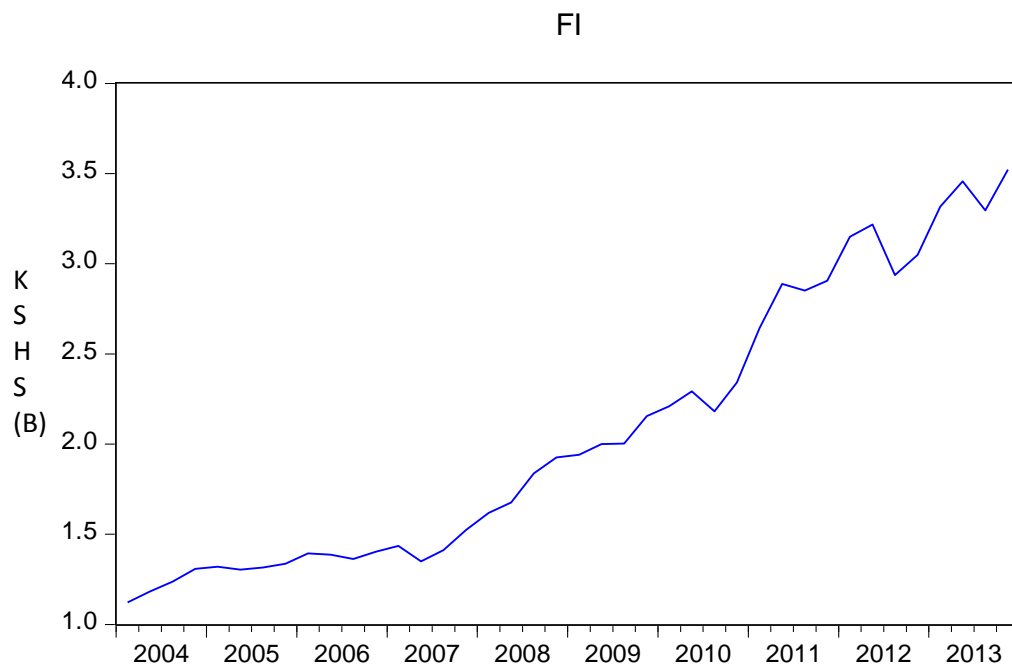


**Source: Authors as per SPSS on raw data**



The Kenya economy has been registering a constant growth in domestic debt ratio between 2004 and 2013; this is depicted by figure 4.2 above which shows the growth as seen from the graph depicts a steep growth between 2010 and 2012, this was due to infrastructural projects being implemented by the government. This growth has continued with a slight slump in 2013 due elections.

**Figure 4.3: Graphical Presentation on the movement of financial intermediation (private domestic credit to real GDP)**



**Source: Authors as per SPSS on raw data**

Financial intermediation is the process by which the financial products are distributed across the country; it also shows how the public partake the financial products like short term and long term loans. In effect it represent how financial institution advance loans to economy. The figure 4.3 depict a growth with some slumps and like interest rate and government policy there is a steep growth in 2004, 2011 and 2012 slumps have been noted in 2007, 2010 and 2013. This shows how an election affects the

growth of financial intermediation as the slumps are as results of mixed feeling about the outcome of elections.

#### 4.4 Correlation Matrix

**Table 4.2 Correlation matrix**

	<b>FD</b>	<b>GP</b>	<b>INT</b>	<b>FI</b>
<b>FD</b>	1.0000			
<b>GP</b>	0.9962	1.000		
<b>INT</b>	0.4655	0.4265	1.0000	
<b>FI</b>	0.9934	0.9975	0.4181	1.0000

**Source: Author's own calculation using SPSS**

Table 4.2 shows the correlation between FI, INT and GP is presented in the correlation matrix above. Each variable is perfectly correlated with itself as indicated by the coefficient of 1. INT has a positive correlation with GP and FI as indicated by the coefficient of 0.4265 and 0.9975 respectively. FI has correlation on FD, GP and INT of 0.9934, 0.9975 and 0.4181 respectively and finally FD has a positive correlation with GP, INT and FI as follows 0.9962, 0.4655 and 0.9945 respectively. This mean all the variable have a positive correlation with financial deepening at 99.62% with government policy, 46.55% real interest and 99.34% with financial intermediation.

## 4.5 Pooled OLS Regression Model

### 4.5.1 ANOVA table

The study used ANOVA statistics to establish the significance of the relationship between financial deepening and the explanatory variables. The regression model is significant given the level of significance at 0.021 ( $p = .021$ ) which is below 0.05, therefore there is statistical significant difference between the means of the dependent and explanatory variables.

**Table 4.3: Analysis of Variance (ANOVA)**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33.8184	3	11.2728	2167.70	0.021
	Residual	0.187212	36	0.00520		
	Total	34.0056	39			
a. Dependent Variable: FD						
b. Predictors: (Constant), INT, FI, GP						

### 4.5.2 Model Fit

Table 4.4 below it can be seen that determination coefficients ( $R^2$ ) were also carried out to determine the strength of the relationship between independent and dependent variables. The study established an adjusted  $R^2$  of 0.9940, which indicate that changes in the dependent variable can be explained by the independent variables in the

equation.  $R^2$  of 0.9945 indicates that 99.45% of the variation in financial deepening is attributed to changes in the explanatory variables. Further the Durbin-Watson test statistic tests the null hypothesis that the residuals from an ordinary least-squares regression are not auto correlated. The Durbin-Watson statistic ranges in value from 0 to 4. A value near 2 indicates non-autocorrelation; a value toward 0 indicates positive autocorrelation; a value toward 4 indicates negative autocorrelation. Since the DW value of 1.9245 was close to 2, then it can be concluded that there was no autocorrelation among the model residual.

**Table 4.4 Goodness of fit statistic**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
					Sig. F Change
1	0.9972	0.9945	0.9940	1.7126539	1.9245

Source: Author's own calculation using SPSS

### 4.5.3 Coefficients of the Model

Multiple regression analysis was used to determine the significance of the relationship between the dependent variable and all the independent variables pooled together. The results are given in the model summary in Table 4.5 below.

**Table 4.5 Regression Result**

	<b>Coef.</b>	<b>Std. Err</b>	<b>T</b>	<b>P&gt; t </b>
GP	0.9118798	0.1660668	5.49	0.000
INT	0.9552197	0.2648023	3.61	0.001
FI	0.0022867	0.2147827	0.01	0.992
Cons	0.4348899	0.0374391	11.62	0.000

**Source: Author's own calculation using SPSS**

From the regression result, the estimated model is given below:

$$FD = 0.4349 + 0.91188GP + 0.95521INT + 0.0022867FI$$

At 5% level of significance all the variables are statistically significant in explaining the variation in financial deepening except for financial intermediaries which is insignificant. With all the explanatory variables held constant, a mean average of 0.4349 will be attributed to financial deepening. This suggest that when real interest rate, monetary and fiscal policies and financial intermediation are held at zero or constant 43.49% of the financial deepening will still occur.

## **4.6 Discussion of the Results**

### **4.6.1 Monetary and fiscal policy ( $\beta_1$ )**

Table 4.5 gives the results of regressed equation where it can be noted that monetary and fiscal policy is statistically significant at 95% confidence level in explaining the changes in financial deepening. The positive effect of monetary and fiscal policy on financial deepening is such that a unit increase in monetary and fiscal policy will lead to 0.91188 increases in financial deepening e.g. borrowing to finance infrastructure or

for government consumption its effect will increase financial deepening by 0.91188. This confirms views in a study carried out by Kariuki (1995) and supports the views of McKinnon (1973) and Saw (1973).

#### **4.6.2 Real interest rate ( $\beta_2$ )**

Real interest rate is statistically significant at 5% level of significance with  $p=0.001$  which is below 0.05. Real interest rate is positively associated with financial deepening. A unit increase in real interest rate will lead to 0.95521 units increase financial deepening. The result is in agreement with Odhiambo (2009) who found a positive impact of interest rate liberalization on the financial deepening in Kenya. The study further concluded that the interest rate liberalization has succeeded in increasing economic growth through its influence on financial depth. According to Keynes (1936), since saving is equal to national income less consumption, it follows that measures which will succeed in restraining growth of government consumption without at the sometime retarding the growth of production will also raise the share of saving in the national income.

#### **4.6.3 Financial intermediation ( $\beta_3$ )**

According to the regression result financial intermediation is not statistically significant at 5 % level of significance with a  $p=0.992$  which is above 0.005. From the result above, financial intermediations is not important determinant of the financial deepening in Kenya. The propensity to save is determined by a large number of factors of which interest rate does not play a major factor. According to Keynes (1936), since saving is equal to national income less consumption, it follows that measures which will succeed in restraining growth of government consumption

without at the sometime retarding the growth of production will also raise the share of saving in the national income.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION, AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents the summary of finds, conclusion, and the recommendations derived from the findings. The chapter also presents the limitations that were encountered with suggestions for further research.

#### **5.2 Summary of Findings**

The objective of the study was to establish the effects of real interest rates on the financial deepening in Kenya. To achieve this objective, the study used data for 40 periods for 10 years divided into quarters, this included the data of domestic debt as ratio of quarterly GDP, real interest rate adjust for Fisher's effect and financial deepening measured using a ratio of domestic private credit to quarterly GDP. The finding is that the real interest rate and government fiscal policy have significant effect on financial deepening, except financial intermediation FI.

Monetary and fiscal policy is statistically significant at 95% confidence level in explaining the changes in financial deepening. The positive effect of monetary and fiscal policy on financial deepening is such that a unit increase in monetary and fiscal policy will lead to 0.91188 increases in financial deepening. This is in agreement with Panicos and Luintel (1996), which stated that exogeneity test reveal that financial deepening and economic growth are jointly determined, thus those policies which affects financial deepening may also have an influence on economic growth. Keynes (1936), had also close or similar views, he urged that measures which will succeed in restraining growth of government consumption without retarding the growth of



production will also raise the shares of savings in the national income. This view is contrary to Hunte and Bryant (1999), from their study they had noted that changes in fiscal policies did not have impact on financial deepening.

Real interest rate is statistically significant at 5% level with  $p= 0.001$  which is below 0.05. Real interest rate is positively associated with financial deepening. A unit increase in real interest rate will lead to 0.95521 units increase financial deepening. The result is in agreement with Odhiambo (2009) who found a positive impact of interest rate liberation on the financial deepening in Kenya. The study further concluded that the interest rate liberalization has succeeded in increasing economic growth through its influence on financial depth. This further strengthen the conclusion of previous study carried out by Oshikoya (1992), who urge that saving function for Kenya showed a significant positive impact of the real interest rate after controlling the term of trade and effects of financial repression. However Kariuki (1995), concluded that interest rate liberalization did have effect on financial development and urged that other factors a part from interest rate which included shillings depreciation of 1980 and fiscal policies might have contributed to the growth of financial depth in Kenya.

According to the regression result financial intermediation is not statistically significant at 5 % level of significance with a  $p=0.992$  which is above 0.005. From the result above, financial intermediations is not important determinant of the financial deepening in Kenya. The propensity to save is determined by a large number of factors of which interest rate does not play a major factor. However; other studies

have put some significance to financial intermediation as a means of mopping up savings and thereby creating financial deepening Kariuki (1995).

The R-the study found a positive relationship (0.07211) on the R squared of .9945 indicates that 99.45% of the variation in financial deepening is attributed to changes in explanatory variables i.e. real interest rate (INT), fiscal and monetary policy (GP) and financial intermediaries (FI). The Durbin -Watson test statistics shows that the null hypothesis of the residuals from OLS is not auto-correlated at a value of 1.9245 which is close to 2 among the models residuals. The results therefore confirms the assertion by James and Chai (1998) finding that over the years financial depth has been strongly influenced by real GDP per capita and the real interest rate. The authors used an error correction model (ECM) derived from their model which revealed that the real rate of interest is a particularly important factor in explaining short run fluctuations in financial depth.

The model of this study was  $FD = \beta_0 + \beta_1INT + \beta_2GP + \beta_3FI + \mu_t$ ; where FD was the financial deepening, INT is the real interest rate and FI is the financial intermediation, while  $\beta_0$  is the equation constant,  $\beta_1, \beta_2$  and  $\beta_3$  are the independent variables constant. At 5% level of significance all variables are statistically significant in explaining the variation in financial deepening except financial intermediaries which is not significant at 0.9. With all explanatory variables held constant a mean average of 0.4349, this means without changes in explainable variable the financial deepening will change by atleast 0.4349.

Using analysis of variance (ANOVA) statistics it is established that the significance of the relationship between financial deepening and the explanatory variables is

statistically significant at 0.021 ( $p = .021$ ) as it is below 0.05 there is significant difference between the means of the dependent and explanatory variables.

### **5.3 Conclusion**

The results obtained from the model shows that there is a positive and statistically significant relationship between real interest rates and financial deepening in Kenya. This implies that real interest rate is a major determinant of financial deepening in Kenya, this confirm other studies as carried out by Odhiambo (2009). Bundi (2013) who investigated the financial liberalization on domestic saving concluded that interest rate liberalization together with credit control elimination have a negative effect on private saving.

The study therefore; lends supports to other similar study which have confirmed the relevance of interest on saving and investment. The study further concurs with a study on financial deepening and further confirms assertions by McKinnon (1973) and Shaw (1973) view on which this study was based on.

### **5.4 Recommendations**

The study has shown that real interest rate is a major determinant of the financial deepening. This further vindicate other research studies which have been carried out in Sub-Saharan Africa, which have indicated that interest rate determine financial development in a country, although other studies highlighted the importance of financial intermediaries the results from this study indicate that it is not relevant to the financial deepening or rather it does not play critical role in financial deepening, this is contrary to the general view that financial intermediation is critical in financial development process.

Although the general measure of test for financial intermediation is based on credit to private sector in the economy, as it measure how funds flow from the financial institutions to the private investors; this not necessarily be a good yard stick to measure financial intermediation and further might have been the reason why the real effects of financial intermediation has been said to be not easy to explain especially on its effects on financial development, due to this weakness it might not be a good proxy of financial intermediaries.

Finally a more robust measure of financial intermediation can be developed either based on the financial branch network as well as the recent development in the access to financial services including mobile financial services which are seen to be a closure measure of financial intermediation. This study further confirms that fiscal and monetary policies mirrored by the domestic debt as ratio of GDP has a positive influence on financial deepening. This also vindicates other studies which had indicated that those policies which are pursued by the country are critical in financial development and therefore can encourage savings.

## **5.5 Limitations of the Study**

The study was carried out using three variables i.e. real interest adjusted for inflation using Fisher's formulae, fiscal and monetary policies and financial intermediation as a proxy of financial deepening. However, in real life there are so many factors which might influence or affects financial deepening apart from the three variables. The researcher felt other variables should have been included i.e. technological development in the financial sector and the use of mobile financial services. It is

possible that if technological development and mobile financial services were included in the study, the results would probably be different.

The measure for financial development is based on (broad money velocity) M3 divided against real GDP, in this study, this has been urged as the most appropriate measure, the results would have been different if other measure would have been used e.g. M2. The study found a gap between the exact measure of financial deepening, the study used the broad money velocity M3 against Real GDP, this was cited by various researchers as the most robust measure of financial development, there are other measures including the M2, the result obtained from a study using M2 would have given a different result.

The result of the study shows that there would still be atleast 43.49% of the financial deepening regardless of real interest rate, financial intermediation and government policies, this suggest that there are other factors which accelerate financial deepening which does really depend on factors which were being studied. The study found that financial intermediation measured on the basis of private credit against real GDP, this measure has a limitation as it only measure that money that goes through the financial system of the economy, and other measure should be developed to address this short coming.

## **5.6 Suggestions for Further Research**

The objective of the study was to establish the effect of real interest rate on financial deepening in Kenya. This study established a positive effect of real interest rate on financial deepening. Future studies should endeavor to determine the effects of growth from the perspective of the development in information and communication

technology and mobile financial services on financial development and its effect on real interest rates.

The study also proxied the financial intermediation by use of private domestic debt against quarterly GDP for the past ten years, the future studies should endeavor to use branch network and mobile phone banking as a way of assessing the its influence on financial deepening. From general perspective access is critical for financial development in a country therefore a study should carried to determine how access to financial products through mobile platform is able to influence the financial deepening.

Aduda and Kalunda (2012) in their study; concluded that inclusion and access are intertwined, therefore another study could be conducted on how financial access and inclusion affects interest rate in a growing economy like Kenya and how this impact on the performance of financial institutions. As domestic debt or lending only look at one aspect of financial access i.e. those people who borrow from the bank but not those who saves as a result of having a bank closer to them.

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## APPENDIX I

### Raw data

<b>Periods</b>	<b>GP Kshs.B</b>	<b>FD Kshs.b</b>	<b>INT Percentage</b>	<b>FI Kshs.B</b>
2004Q1	1.4991	1.661596	-10%	1.121229
2004Q2	1.5702	1.729254	-4%	1.183063
2004Q3	1.6274	1.770225	-15%	1.237312
2004Q4	1.6714	1.813667	-12%	1.307461
2005Q1	1.6606	1.816451	-9%	1.31964
2005Q2	1.5860	1.78786	-6%	1.303128
2005Q3	1.6195	1.821505	-4%	1.315686
2005Q4	1.6577	1.872418	-1%	1.336779
2006Q1	1.7281	1.94069	0%	1.393493
2006Q2	1.6850	1.955509	2%	1.385882
2006Q3	1.7035	1.989293	2%	1.362364
2006Q4	1.7826	2.050877	3%	1.403262
2007Q1	1.8062	2.08519	5%	1.435048
2007Q2	1.7933	2.116024	4%	1.349008
2007Q3	1.8791	2.182196	4%	1.411613
2007Q4	1.9243	2.280501	4%	1.523442
2008Q1	2.1105	2.47353	2%	1.61821
2008Q2	2.0534	2.459881	-1%	1.676488
2008Q3	2.2716	2.49624	-4%	1.837153
2008Q4	2.3715	2.620229	-7%	1.92599
2009Q1	2.4046	2.600756	-8%	1.940641

<b>Periods</b>	<b>GP Kshs.B</b>	<b>FD Kshs.B</b>	<b>INT Percentage</b>	<b>FI Kshs.B</b>
2009Q2	2.4791	2.725919	-6%	1.999943
2009Q3	2.5442	2.819169	-4%	2.002688
2009Q4	2.7556	3.014568	-2%	2.154456
2010Q1	2.9253	3.186274	0%	2.209333
2010Q2	3.0790	3.396864	1%	2.292167
2010Q3	2.9146	3.181981	2%	2.181551
2010Q4	3.0963	3.313136	2%	2.340933
2011Q1	3.4539	3.627733	1%	2.642188
2011Q2	3.6819	3.781864	-1%	2.888209
2011Q3	3.6459	3.65137	-3%	2.850823
2011Q4	3.7275	3.749841	3%	2.905307
2012Q1	4.0406	4.004091	1%	3.150187
2012Q2	4.0644	4.181162	2%	3.218201
2012Q3	3.8093	3.929628	0%	2.936538
2012Q4	4.0063	4.065526	1%	3.048275
2013Q1	4.3745	4.384543	3%	3.317239
2013Q2	4.4659	4.56092	4%	3.456696
2013Q3	4.1621	4.239232	4%	3.295171
2013Q4	4.3923	4.520115	3%	3.522334

**Key:**

**FD= Financial Deepening**

**INT= Real Interest Rate**

**GP= Government Policies**

**FI= Financial Intermediation**

**Source: KNBS and CBK**