THE EFFECT OF MACROECONOMIC VARIABLES ON INTEREST RATE SPREAD IN THE COMMERCIAL BANKING SECTOR IN KENYA

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DECLARATION

I declare that this is my original work and to the best of my knowledge has not been presented in any other university or institution of higher learning for academic award.

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This research project has been submitted for examination with my approval as the university supervisor.

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DEDICATION

I dedicate this work to my parents Mr. Walter Sireka and Mrs. Maktilda Okinda for their love, moral support and inspiration. I also dedicate this work to my siblings Shillah, Allan, Valentine, Jane and my treasured friend Saumu for their encouragement and prayers.

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LIST OF ABBREVIATIONS

CBK Central Bank of Kenya

GDP Gross Domestic Product

IRS Interest Rate Spread

KNBS Kenya National Bureau of Statistics

T-bill Treasury Bill Rate

ABSTRACT

The study sought to establish the effect of macroeconomic variables on interest rate spread in the commercial banking sector of Kenya. Descriptive research design was used. Secondary data were collected from the first quarter in 2006 to the second quarter of 2017 a period of 10.5 years. This data was collected from the Central Bank of Kenya statistics and Kenya National Bureau of Statistics database. This data on IRS and macroeconomic variables studies was regressed in a multiple linear regression model through SPSS V 21.0, which established statistically insignificant negative relationship between repo and IRS. It also established statistically significant positive relationship between CBR and foreign exchange and IRS. There was statistically insignificant positive relationship between 90 days T-bill, inflation and GDP and IRS. There was statistically insignificant negative relationship between repo and IRS. The recommendation of the study is that the government through CBK in order to ensure increased financial intermediation and lowering the cost of funds should anticipate to controlling macroeconomic fundamentals more efficiently particularly foreign exchange and CBR as major tools of managing high IRS. The open market activities by the government should not be used as main tool to controlling the cost funds is also a study recommendation.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Commercial banks contribute to the economic growth by availing funds to investors as well as financial deepening in the economy (Otuori, 2013). Financial stability of any country depends largely on commercial banks who carry out the essential duty of mobilizing resources from savers and lending to borrowers hence acting as financial intermediaries. According to Crowley (2007), higher bank interest rate spread is not only indicative of the inefficiency of the banking sector but also a reflection of the level of development of financial sector. Levine (2008) established that the efficiency of financial intermediation can affect economic growth due to the fact that investors borrow from banks and engage in economic activities which have direct impact on GDP. The important role played by banks can be used to analyze and establish the general economic performance by analyzing the interest rate spread which is the variance between the deposits and lending interest rates.

A large interest rate spread can be a key hindrance to expansion and development of financial intermediation and deepening (Chand, 2002). A large interest rate spread discourages potential savers are due to low returns on their investments and this in return limits funds available to borrowers, (Ndung`u & Ngugi, 2000).

The funds available to borrowers are very costly. Interest rate spread understanding is very important in financial sector evaluation as commercial banking players have been among the most profitable institutions in the last decade with interest income being their major part of bottom-line.

Commercial banks help mobilize resources and provide credit in the economy hence act as very vital players for the governments in determining the monetary policies to help regulate the financial operations (Ho & Saunders,1981) . To control commercial banking sector, the regulators globally use various monetary policy tools which aim at reducing the interest rate spread which in the end has an impact on the commercial banking sector lending policies and general economy. According to Folawewo and Tennant (2008), a wide interest rate spread can be an indicator of banking sector inefficiency or a reflections of financial development level. They also conclude that information in regards to financial intermediation efficiency, profitability and monetary policy is embedded in the spread.

Differences in interest rate spread and bank profitability is explained by bank characteristics, macroeconomic variables, implicit bank taxation and deposit regulation (Demirguc-Kunt & Huizinga, 1999). Their findings are based on 80 commercial banks sampled across the world. They do not specify the effect that macroeconomic variables have on the spread .Some studies have found only bank specific factors as being important in spread determination. According to Ahokpossi (2013), bank specific factors mainly credit risk, liquidity needs and bank equity are important factors in determining spread and it does not rule out the impact macroeconomic variables have on the spread.

Gremi (2013), concluded that lending markets are greatly influenced by the macroeconomic environment. Quaden (2004), found that a more efficient banking system benefits the real economy by allowing higher expected returns for savers with financial surplus, and lower borrowing costs for investing in new projects that need external finance.

Studies undertaken globally suggest that the determinants of bank interest rate margins vary across countries. According to Ho and Saunders (1981) the net interest margin have a significant positive relationship with a bank's level of capital, loan loss provisions, reserve requirements, implicit interest payments, and interest rate volatility in developed countries. A study of Latin American bank spreads by Brock and Suarez (2000), established that loan losses and bank capital tend to have significant negative relationships with bank spreads in some Latin American countries. Robinson (2002), suggest that in most developing nations, the banking industry dominates the financial structure and securities are not well developed. It therefore serves as the main financial intermediation channel aimed at availing funds for investment. Zarruk (1989), considering risk management by the bank, found that risk-averse banks operate with a smaller spread than risk-neutral banks, while Paroush (1994) explains that risk aversion raises the bank's optimal interest rate and reduces the amount of credit supplied. Gremi (2013), argue that restrictions on bank behavior imposed by the government often result in negative real interest rates and an excess demand for credit requiring banks to ration their lending.

1.1.1 Interest Rate Spread

Jayaraman and Sharma (2003), define interest rate spread as the difference between average interest rate earned on interest generating assets and the average interest paid on deposits. Commercial banks to be able to generate income to their stakeholders they always add a premium to the rate they charge depositors and this difference servers as the interest rate spread. Robinson (2002), highlights that loan rates charged by commercial banks can be separated into two major components. One is the interest rate paid to depositors and the other rate is risk premium. That difference between the deposit rate and the loan rate is commonly referred to as the spread. Financial intermediation largely depends on IRS in that, if it is too big it may discourage depositors from saving in banks and hence reduce the amount of funds available to borrowers (Khalid *et al.,* 2002). He argues that this leads to low economic investments which in the end leads to slow economic growth.

Towards the end of the last century, many sub Saharan countries started operating as market based economy. This means that both deposit and lending rates have been left to depend on demand and supply forces (Ahokpossi, 2013). Market forces have been the main determinants of financial stability in these countries. IRS is a key variable in financial intermediation process (Jayaraman and Sharma, 2003). It reflects the additional cost of borrowing as charged by commercial banking players in linking borrowers to the fund lenders. According to Khalid *et al.,* (2002), the level of IRS varies across the world and is indirectly relates to the level of financial efficiency. The nature and stability of a financial sector in a given country are the main factors causing differences in spread across the world. Jayaraman and Sharma (2003), found out that in unstable economic conditions,

financial intermediation costs of deposit mobilizing and moving these funds to productive sectors are high hence larger spreads.

1.1.2 Macroeconomic Variables

According to Simon and Robert (2011), macro-economic factors include economic growth, interest rates environment, foreign currency versus local currency exchange rates and consumer price index. These are factors of overall importance to the position of country's economic performance. They affect a very large proportion of the population. These factors are economic output, unemployment, savings, inflation and investments and they are closely watched and checked by the particular governments to ensure a closer track of economic performance is kept (Khalid *et al.,* 2002). Kwon and Shin (1999) consent that Gross Domestic product, exchange rates, interest rates, inflation and market risk are the most important macroeconomic variables of any country that should be monitored closely. This factors in the end affect the general economy as suggested by (Mishkin 2004) that economic growth is majorly influenced by individual macroeconomic variables and they greatly influence investment in an economy and economic growth (Lueth & Ruiz-Arranz, 2008).

Macroeconomic variables that directly affect the general economic development are growth rate, interest are environment, consumer price index and exchange rates (Brinson, Singer & Beebower, 1991). Governments in order to ensure stability in the financial systems, monetary policies are set and controlled by the commercial banking sector regulators which are the bodies mandated to undertake this duty (Demirguc-Kunt &

Huizinga, 1999). They are required to set the monetary policy that affects the whole economic activities in the country. According to Barajas *et.al*, (1999), changes in macroeconomic variables are directly transmitted to changes in the level of interest rates charged by commercial banks

1.1.3 Macroeconomic Variables and Interest Rate Spread

The strength of financial institutions is a very critical factor in stimulating economic growth and development, foreign and domestic investment, poverty reduction and employment creation (Kyalo, 2002). Interest rate spread is the difference between the weighted average lending rate and the weighted average deposit rate of funds in a given economy (Barajas, Roberto and Natalia, 1998). They conclude that in analyzing the level of interest rates governments should be able to set a given inflation rate target and the general these interest rates be able to move the rate of inflation and general economic growth to the expected levels.

Macroeconomic variables are not significant in analysis of interest rate spread as they are fully dependent on bank specific factors (Seetanah *et al*,. 2009).They argue that macrocosmic factors play no role in interest rate spread determination but various studies have shown that macroeconomic variables have an important role and are therefore vital variables in interest rate spread determination. This can be seen from (Podder, 2012) who concluded that a weak and unstable macroeconomic environment creates uncertainty about financial and economic growth and returns on investments making defaults on loans more likely. This makes commercial banking players rise the premium on loans to counter this

credit risk hence a high interest rate spread. Inflation is a critical factor in the economy, it creates problems for housing finance as it increases the level of interest rates (to compensate for expected future price increases) and their variability. According to World Bank (2009), the appropriate class of instruments for a market will depend on the inflationary environment.

In the analysis of macroeconomic variables (Mishkin, 2004) in his econometric analysis conclude that exchange risk, Treasury bill rate, reserve requirements, public debt ratio, liquidity ratio and quality of loans are not the only determinates of interest rate spread but many other macroeconomic variables have an impact on the spread. Interest charged is a major source of bank revenues hence it is a major monetary policy function that should be addressed by the regulator if it has to realize efficient financial stability by looking at the level of deposit and lending rates. According Tofolawel *et al*., (2008), interest rates reflect the banks perception about risk, liquidity status and cost of doing business and the level of competition in financial sector. Hence by analyzing the IRS, one can establish the level of economic investments likely to occur in the country based on returns to depositor and lenders and the overall costs to borrowers. This in the end determines the level of economic performance and stability.

1.1.4 Commercial Banking Sector in Kenya

Banking sector consists of central bank as the regulator, 43 commercial banks and one mortgage company. Out of the total number 14 commercial banks are foreign owned while 25 are locally owned by the shareholders are citizens in Kenya (CBK, 2015).

According to the Banking Act Cap 488, among the main roles of the regulator is to ensure financial stability of the country and inflation control .central bank in order to meet this goal has over time come up with regulatory and monetary policies (Ngugi, 2001). Capital requirements has been enhanced over time from 250 million s in 1998 to 1 billion Kenyan shilling in 2008. This was aimed at ensuring citizen confidence in commercial banking sector is improved and also to strengthen the institutional structures in the banking sector (Kandie, 2014).

The commercial banking sector has undergone tremendous growth over the years. According to Athanasoglou *et al.,* (2005). Between early 1970s and 1980s, Banking sector by then have immensely taken dominance during this time as compared to the financial sector as this sector was characterized by financial repression. In applying unswerving tools of monetary policy the administration in governance has played a great role in allocating credit for investments and extensively brought a turn around on the sector. Late years of 1980s and initial 1990s years there was structural adjustments programs and liberalization which spearheaded the second phase. This period was characterized by moderation of the rates affecting general price increase and principal accounts controls which remained been observed. A sector initiating slight interest rates which are diverse, upturn obtainability of financial resources over amplified investments, improve effectiveness in credit apportionment hence growth in investments catering for an essence need of reforms in the financial sector. In the late 1990s. Fresh products emerged in the sector comprising of Islamic banking, automatic teller machines, credit cards and electronic-money midst the rest come up and were witnessed in this sector (Athanasoglou *et al.,* 2005).

According to Podder (2012), commercial banks play an important role in ensuring financial intermediation hence need to be of concern to all economic stakeholders including sharholders,depositors,investors,creditors,management,regulators and the governmrnt.in Kenya particularly, banking sector plays the most important role in financial sector by credit provision and savings mobilization. According to Kibe (2003), because of macroeconomic instability characterized by high inflation, unstable foreign exchange rate, high cash reserve requirements and slow economic growth leading to high level of non-performing loans, interest rate spread is high in kenya.an analysis of the spread is therefore important in understanding the macroeconomic environment in which commercial banks operate. According to Otuori (2013), the central bank has been publishing quarterly reports on bank charges, lending rates and deposit rates for all banks so as to ensure citizens make informed decisions in banking sector. All this is done to ensure a reduction of spread but all these tend not to have been able to lower the spread to the desired level in relation to the spreads in stable international economies.

The Companies Act, the Banking Act, the Central Bank of Kenya Act and various prudential guidelines issued by the Central Bank of Kenya govern the banking industry in Kenya. The Central Bank of Kenya is responsible for formulating and implementing the monetary policy and fostering the liquidity, solvency and proper functioning of the financial system. Chand (2002) in his study found that factors that causes of high interest rate spreads in Kenya are perceived market risks, high fixed operating costs lack of adequate competition and existence of regulatory controls. All these factors lead to arise in the cost of financial intermediation in the economy hence a direct impact on interest rate

spreads in testing financial intermediation efficiency in Kenya, interest rate spread is the most ideal variable to use (Beck *et al,.* 2010).They found out that spread is dependent on overhead costs, loss provisions and taxes. These are the main factors likely to affect financial stability, efficiency and outreach.

1.2 Research Problem

A key variable in financial system in any country is the difference between the interest rates on deposits and credits (Barajas *et.al.,* 1999). When the IRS is too large, leads to low economic growth as it discourages many people to save as their returns on saving money is low while the amount of credit available to borrowers is reduced and limited and also the little loanable funds available will be too expensive. Ultimately this may lead to a slowdown in economic activity as few new investments are undertaken due to lack of funds.

The government s has a major role in ensuring economic stability which it does through its monetary policy decisions. These are mainly aimed at controlling inflation, and stimulate economic growth. It has set the many tool of ensuring that this goal is achieved. These include the CBR, cash reserve requirements and alternative investments from the government through treasury bills and bonds. Kenya being a liberalized economy, CBR aims to ensuring that borrowers have access to funds at the lowest cost possible while depositors are compensated appropriately for their investment. CBR is supposed to assist commercial banks ensure that there is adequate financial intermediation by having the smallest IRS at all times that in the end will stimulate economic growth sustainably.

Commercial banking players on the other hand are in the business of making profits other than just ensuring financial intermediation. They always add a premium to the rate set by regulator in order for them to maximize their revenues. Loans play a major source to commercial banks (GOK Economic Recovery Strategy, 2003). CBR therefore is set not only for banks to use but also to ensure they are able to avail credit to borrowers as and when they need arise while ensuring appropriate returns to depositors of funds in their accounts. State regulations, credit risk and microeconomic environment play an important role on influencing IRS hence performance of commercial banks (Langat, 2013).

According to Quaden (2004), a more efficient banking system benefits the real economy by allowing higher expected returns for savers with financial surplus and lower borrowing costs for investors in new projects that require external funding. Hence for a proper functioning financial system, commercial banks play an important role in ensuring that funds are available to investors at any moment at the right cost and simultaneously to depositors and with such, economic growth is inevitable. The CBK therefore seeks to ensure this growth occurs by establishing an equilibrium in the financial market through cost and return regulation using the CBR and other aggregate sectorial tools like repos and cash reserve requirements. This can be analyzed clearly by studying the effects of major macroeconomic variables and IRS and determine if indeed these tools used by the Government to minimize the cost of credit have been able to meet its goal of ensuring economic growth. According to (CBK, 2015), the banking sector was in a difficult period of high level of high ratio of non-performing loans, insufficient credit availability and

persistence in large IRS hence high cost of credit while several tools has always been used to address this.

From the outlook of Kenyan economy specifically, IRS has been at a high level and frequently on the up rise despite all the efforts of the government to ensure that IRS narrows especially through the monetary tools. This study sought to establish the effects of major macroeconomic variables on as IRS in ensuring economic growth and stability. This was aimed at ensuring inflation control and ensuring competitiveness in the financial sector. This study used the data on IRS and macroeconomic variables as from first quarter of 2006 to second quarter of 2017 as it sought to establish the effect macroeconomic variables have on IRS.

1.3 Research Objective

The main objective of this study was to establish the effect of macroeconomic variables on interest rate spread of commercial banking sector in Kenya.

The specific objectives were;

i) To determine the effect of central bank rate on interest rate spread in Kenya.

ii) To establish the effect of repo rate of on interest rate spread in Kenya.

iii) To analyze the effect of gross domestic product on interest rate spread in Kenya.

iv) To determine the effect of Treasury bill rate on interest rate spread in Kenya.

v) To analyze the effect of inflation rate on interest rate spread in Kenya.

vi) To establish the exchange rate on interest rate spread in Kenya.

1.4 Value of Study

This study will be useful to CBK especially in the monetary policy decisions in determining if using CBR, Treasury bill rate and repo rate as the main tools of inflation control and economic growth has been able to meet its objective as it seeks to ensure financial intermediation and proper bank regulation. This study analyzes this with IRS as a benchmark and seeks to assist CBK in formulation policies that encourage lending and borrowing in the industry. It will also be useful to academia, students, bankers and future studies of CBR and IRS movement of Kenyan commercial banking sector and hence act as a basis for future reference. The general Kenyan citizens will also benefit on the information on IRS from this study.

This study will also be important to commercial banks management in Kenya as they will be able to establish whether pricing their products based on CBR is viable and how they can improve their competitiveness in the market using the knowledge on IRS.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

So as to avoid replication of what other studies have been done on this topic, literature review seeks to provide both theoretical and empirical view on the interest rate spread as matter being studied. Literature of this study was reviewed from journals, books, working papers and periodicals. It reviews theoretically the effect of macroeconomic variables on IRS. It also analyzes empirical studies done both locally and internationally on this topic. This chapter is organized into; theoretical review, empirical review on IRS, conceptual framework and a summary that will highlight the knowledge gap this study seeks to fill.

2.2 Theoretical Review

This section analyzes different theories that have provided arguments about interest rate spread. These theories include; regulation theory of interest rate determination, loanable fund theory and liquidity preference theory.

2.2.1 Regulation Theory of Interest Rate Determination

Komiya (1964) and Suzuki (1994) who were Japanese economists developed this theory which holds that interest rates charged on loans in a given country are determined by a regulatory body. It argues that lending rate are fixed at any level below the intersection of supply (deposited funds) and demand (borrower's needs) of funds available for lending. This theory argues for regulators as being the main determinant of interest rate that all market players should follow.

Once a rate has been set, it serves as the minimum rate that is charged on all loanable fund in the market. It also assumes the rate charged as returns on depositors is set by regulators and this will be able to induce depositors make their investments by saving in financial institutions (Takeda, 1985). The limitation of this argument is the inapplicability in the liberalized economies .It's possible for regulators to directly influence the interest rates but it should be subject to fluctuations for an equilibrium interest rate to be set in the economy. This theory assumes that only demand and supply of funds should determine the interest rates charged but pays little attention to other factors like individual risk premium and general public saving and borrowing priorities (KBA, 2016).

2.2.2 Loanable Fund Theory

Thornton (1802), Wicksell (1936) and Robertson (1937) come up with this theory that holds that lending interest rate is calculated on the basis of funds available for lending. It argues that both investments and savings are important in interest rate determination. It holds that determinants of funds available for lending are; net increase in currency deposits, savings made, and willingness of country's to enhance cash balances and existence of opportunities for formation of fresh capitals. It is based on the assumptions that; loan market isn't always fully integrated in any economy and it is characterized by perfect mobility of funds in the market and also perfect competition of funds exist in the market (Viney`s, 2009). This ultimately leads to both depositors and borrowers being price takers as only one interest rate prevails in the market for each group.

John Keynes (1933), established that nominal interest rate is determined by supply and demand intersection when he established the macroeconomic theory .He argued that increase in demand of funds increases interest rates while fall in demand for funds lowers the rate of interest. Also increase in supply of loanable funds lowers the rate of interest while low supply of fund leads to rise in interest rate. All this is based on the fact that savers make a decision between present and future consumption. While borrowers will only consider the cost of fund when deciding whether to borrow or not. This theory doesn't consider savings not channeled to the loan market but invested directly if investors do not prefer the prevailing interest rate (Rodgers, 1985). He adds that does not consider investments not funded by borrowing but with own funds and also borrowing that are not invested but used for other consumption purposes. This theory does not establish the other factors that are vital in interest rate spread establishment but only considers supply and demand of funds as being the only determinants.

2.2.3 Liquidity Preference Theory

John Maynard Keynes (1946) come up with this theory. It is based on the assumption that that investors prefer short term financial investments to long term ones because they are less risky to default, are more liquid and have a less maturity period. It advocates for compensation for less liquidity and high risk of default to investors in case they choose to make long term financial investments. Keynes defined interest rate as the reward received for foregoing use of funds for a given period of time and it is determined by demand and supply of financial funds in the economy. It proposes three reasons as to why people hold

onto cash rather than make investments .These motives are transaction motive, precautionary motive and speculation motive.

All these motives change when investors are able to receive a proper premium if they choose to deposit their funds rather than hold (Inayat, 1993). This theory therefore argues that interest rate is the main determinant of funds supply in the market .compensation from investing or a given period of time is assumed to be the main determinant of supply and demand of loanable funds in the economy. This theory falls short in the essence that there are many factors other than liquidity preference that affect the level of interest rates (Takeda, 1985). If the theory held it should be able to explain the existence of different interest rates at the same time which it does not.

2.3 Determinants of Interest Rate Spreads

Interest rate spread is the difference between the weighted average lending rate and the weighted average deposit rate of funds in a given economy (Barajas, Roberto and Natalia, 1998). They conclude that in analyzing the level of interest rates governments should be able to set a given inflation rate target and the general these interest rates be able to move the rate of inflation and general economic growth to the expected levels. Macroeconomic variables are not significant in analysis of interest rate spread as they are fully dependent on bank specific factors (Seetanah *et al,*. 2009).They argue that macrocosmic factors play no role in interest rate spread determination but various studies done in Kenya have shown that macroeconomic variables have an important role and are therefore vital variables in interest rate spread determination.

This can be seen from (Mugume and Ojuayi, 2009) who concluded that a weak and unstable macroeconomic environment creates uncertainty about financial and economic growth and returns on investments making defaults on loans more likely. This makes commercial banking players rise the premium on loans to counter this credit risk hence a high interest rate spread.

In the analysis of macroeconomic variables (Mishkin, 2004) in his econometric analysis conclude that exchange risk, treasury bill rate, reserve requirements, public debt ratio, liquidity ratio and quality of loans are not the only determinates of interest rate spread but many other macroeconomic variables have an impact on the spread. Ngugi (2001), found out that spread is positively related to deposit level while negatively related to loans and the ratio between liquidity and non-performing loans which he concluded that the rising level of this ration rises the level of interest rate spread but all this are dependent on the general health of the economy.

According to Chirwa and Mlachila (2004), inflation rate is the cost of doing business in a given economy and it is expected to have a positive relation with interest rate spread .Inflation is measured as percentage change in consumer price index According to Cukierman and Hercowitz (1990), they found out that when the number of banking firms is finite, an increase in anticipated inflation leads to an increase in interest rate spread and when these banking firms approach infinity which is the competitive case, there is no correlation between interest rate spread and inflation because the spread tends towards marginal cost of intermediation as the number of banks increases.

Different studies have concluded variably in regards to impact of gross domestic product and interest rate spread. Claessens, Demirguc-Kunt and Huizinga (2001), found a positive relationship between economic activities and interest rate margins while Maria and Agoraki (2010), did not find any effect of economic activities and interest rate margins in their study across Europe. Demirguc-Kunt and Huizinga (2001), found a negative relationship between economic activities and interest rate spreads

The level of GDP has a direct relation with the level of investments been done in the country. Interest rate spread measures how much investors are able to forego current consumption and put their resource as investments in the commercial banking sector based on the expected returns. If this rate is favorable, funds are available to borrowers to use for investments but they also consider the cost which the interest rate charged by commercial banks. According to Maria and Agoraki (2010), low economic growth weakens the debt servicing capacity of domestic borrowers and contributes to an increase of credit risk which consequently increase the interest rate margins.

Repos refer to the rate that the regulator lend on short term basis to commercial banking players against their security as deposits with the regulator. It is used as a monetary policy instrument. It is expected to be positively correlated with IRS, as it increases the commercial banks' cost of funds, which may be passed on to customers through higher spreads (Banda, 2010). This occurs when there is a shortage of funds to lending from this sector. Reduced repo rate assist commercial banking players get funds cheaply to advance

as loans to borrowers as opposed to costs incurred from depositor's funds. Repos hence have a direct impact on the IRS.

Treasury bills are short term securities that are issued and purchased by the government. The difference in the prices is the yield received to investors. This rate helps investors make a decision on the investment vehicle to use based on returns received. The Treasury bill rate is generally regarded as an indicator of the interest rate policy being pursued by the government, and a benchmark for the rates charged by commercial banks. This variable is therefore also supposed to be positively correlated with IRS, because lower Treasury bill rates would lead to lower interest rate spreads and vice versa (Banda, 2010). Commercial banking sector players also use t bill rate to price their products. Hence having a relation on the amount of funds available to lending for investment by borrowers.

Were and Wambua, (2013), increased economic activity can heighten demand for loans leading to higher lending rates. On the other hand, increased economic activity can make projects more profitable, reduce defaults, and increase deposits all of which reduce spreads. Additionally, the policy rate which is the Central Bank Rate (CBR) is included as a monetary indicator to capture the effect of monetary policy. Macroeconomic instability is measured by the variable exchange rate volatility. This variable reflects the changes in interest and inflation rates in countries with freely-floating exchange rates. Exchange rate volatility for each quarter is calculated as the standard deviation of the percentage change in the real exchange rate for the three preceding quarters.

According to Chirwa and Mlachila (2004), if there is increased macroeconomic instability increases the risk faced by commercial banks, exchange rate is expected to be positively correlated with IRS in the banking sector.

2.4 Empirical Review

Different scholars have done research on IRS both locally and internationally. Locally, Tarus *et al.,* (2012) in their study of IRS of 44 commercial banks in Kenya using data from 2000-2009 and employing both fixed and pooled effects model found out that operating costs and credit risk have a positive relationship with IRS while economic growth and bank market concentration have a negative relationship with IRS. Inflation level according to their findings has a negligible impact on the level of IRS. In their analysis, they use a micro economic approach to each specific bank then do the aggregate analysis based on market concentration. It's from this aggregate analysis that they do an analysis of economic growth and inflation but do not look into specific factors that are used to control inflation while stimulating economic growth which this study aimed at reviewing in relationship with IRS.

Were and Wambua (2013), in analysis of determinants of IRS in Kenya, they analyzed data from 43 commercial banks as from 2002 to 2011. They found out that bank size, credit risk, liquidity risk and return on assets positively impacted IRS. However, GDP and inflation had negative impact on IRS. In their study they mainly used KBRR which had CBR as minor component yet it is the main tool used by CBK to control inflation and ensure economic growth in the country.

Kibe (2003), analyzed profitability of commercial banks and IRS. He found out that IRS account for about 40% of total variations in profitability of commercial banks hence he finalized by advising banks not to focus on large IRS as a major source of their income. His findings acknowledge the importance of IRS in the economy and how it varies over time but it doesn't clearly show how specific factors in the economy vary with IRS. Also his study doesn't show how the CBK impacts their profits through use of monitory tools that in the end cause changes in the IRS over time.

Beck *et al.,* (2010), used IRS as main tool of analysis of financial intermediation to study development of Kenyan financial stability and efficiency. They analyzed data on commercial banks operating costs, loan loss provision and taxes which all were found to have a positive relationship with IRS .Their study focuses on microeconomic variables as main determinants of IRS but this study focuses on macroeconomic variables used by CBK to control inflation and specifically CBR as it's the main tool employed to meet this goal and relates it to IRS to show the level of financial stability and deepening in the counter.

Ngugi (2001), analyzed IRS from 1970 to 1999 and found that in Kenya IRS was large because of inefficiencies and high financial intermediation costs on the Kenyan economy. She found a large level on non-performing loans as a result of financial inefficiencies which she attributed to poor business environment and distress in borrowing. This according to her is as result of lack of formal alternative of credit sources. She noticed an increase in Treasury bill rate and inflation rate over the period hence need to regulate this. This made banks to rise their lending rates.

However, when Treasury bill rates and inflation rates fall, bank do not reduce their lending rates as this would lead a reduction in their revenue. She analyzed inflation, monetary policy, inefficiencies in banks and high intermediation cost in her study. Her study doesn't look and identify the specific monetary policy tools used by CBK to ensure that IRS are small in relation to control of inflation and ensuring economic stability.

International studies have also been done on this topic. Chirwa and Mlachila (2004) investigated IRS causes in Malawi using panel data for a period of 1990 to 1999 on commercial banks. Their findings show that high IRS experienced in Malawi was as a result of monopoly power of a few banks, high reserve requirements, high discount rate and high inflation. Their study doesn't analyze the relationship between economic growth and IRS and also the Malawian banking market was monopolistic then hence the researched variables would have a different impact on IRS on a competitive market alike Kenyan banking sector.

Ghak (2004) did an evaluation on IRS on Croatian banking sector from 1999 to 2003. He found that interest rates spreads in the market were a function of deposit rate, total assets, level of non-performing loans and capital adequacy who had a positive relationship while market share and liquidity had a negative relationship with IRS. His study is based on microeconomic variables of each specific bank but doesn't show the relationship of macroeconomic variables with IRS.

Valverte *et al* (2004) in their analysis of IRS found out that only a fraction of savings in commercial banks can be put into investments due to financial intermediation cost between depositors and borrowers. They observed that increased commercial banks inefficiency increased costs of intermediation hence reducing lending levels and hence level of investment in the economy. In their study they do not clearly state the cause of this inefficiency in banking sector and how they are used by regulator to ensure that this problem is addressed over the period of their study.

Boldbaatar (2006) analyzed commercial banks IRS implication in South East Asia's 40 commercial banks. Findings show a positive relation between economic growth, inflation level, credit risk, operating cost and reserve requirements and IRS. From their study only bank size had a negative relationship with IRS. The study was done in fairy developed countries in relation Kenya and they did not study on impact of repos on IRS which this study will use as one of input variables.

Recent studies have also been done on the factors that determine IRS specifically in the Kenyan commercial banking sector. Otambo (2014), concluded that there exist a strong relationship between that GDP, lending interest rate, exchange rate and inflation rates and financial performance of Kenyan commercial banks. He pegs the levels of financial intermediation on the overall commercial banking sector. His analysis assumes that as long as the commercial banking players are profitable then funds are available for lending and this indicates the high level of financial stability in the country. He does not consider the

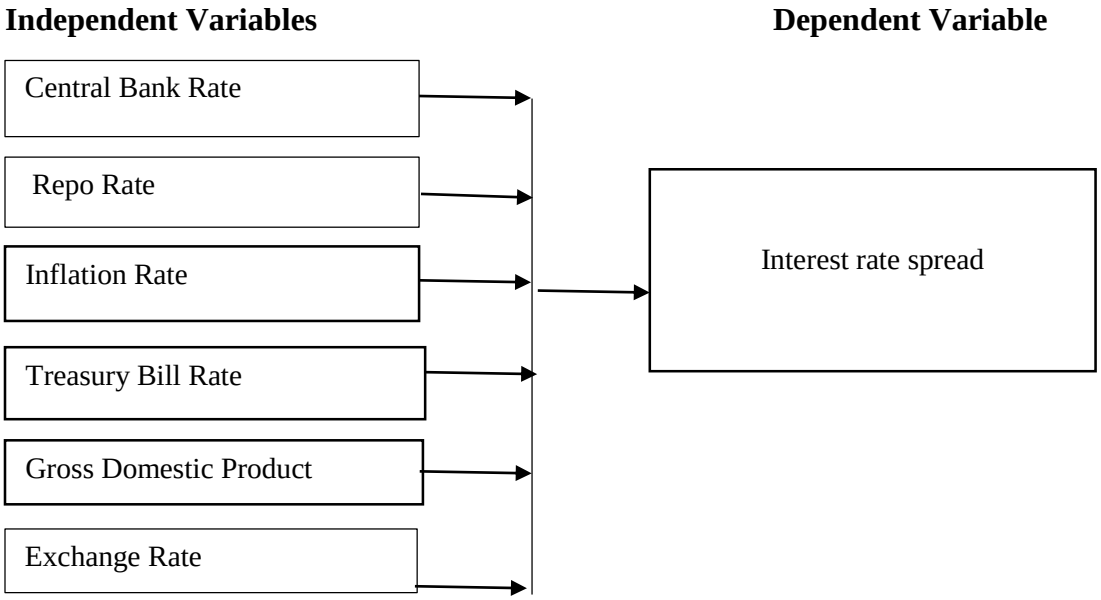
level of IRS as a main determinant in availability of funds depending on the prevailing macroeconomic environment.

Ngenja (2016) in his analysis of the cost of funds in Kenyan commercial banking industry, he established that inflation, interest rate level and exchange rates have a negative relationship with the loan default rate. His study however does not show impact of the rate on lending on deposit rate and how the two rates affect availability of funds I n the economy. Chelangat (2011) concludes that exchange rates and inflation rates do not have an impact on IRS and the two variables have no influence on cost of debt in Kenya, he argues that IRS mainly dependent on microeconomic variables of each specific player in the country.

2.5 Conceptual Framework

This shows how dependent variable in this study relates with independent variables.

Figure 2.1. Relationship between CBR and IRS of commercial banks in Kenya.



Source (Author, 2017)

Figure 2.1: Conceptual Framework

2.6 Summary of Literature Review

From the literature review, it shows that market share, non-performing loans, deposit rates, inflation, operating costs, reserve requirements and monopoly powers have a positive relationship with IRS while money market rates, bank size and economic growth have a negative relationship with IRS. Most of these studies especially on macro-economic variables and they been done in other regions and continents with developed and developing countries. Studies on Kenyan economy have in most cases have been on bank specific factors and yet this may not be the ideal case of IRS understanding. According to (Brock and Franken 2002), results of many studies on bank characteristics do not find any relationship hence IRS may be largely determined by macroeconomic variables. This study sought to incorporate major macroeconomic variables in analysis of their effect on IRS which prior studies have not explored yet it's the main tool use by CBK in ensuring economic stability.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research design and research methodology used in this study. It is divided into sections as; research design, target population, data collection instruments and procedures and data analysis and presentations to be used in the study.

3.2 Research Design

A research design is a statement of the essential elements of a study and constitutes the blue print for collection, measurement and analysis of data (Cooper and Schindler, 1998). This study used a descriptive research design. According to Cooper and Schindler (1998), descriptive research design trys to define a subject by creating a group of problems or events from data collected and tabulating the frequencies on the research variables and their interaction. It also studies existing variables hence is appropriate when studying the relationships or effects of variables on others.

3.3 Data Collection

This study was based on secondary data collected from Central Bank of Kenya statistics in its published economic reviews and website, data from commercial banks publications and the Kenya National Bureau of Statistics (KNBS). The period of data analysis was from first quarter of 2006 to the second quarter of 2017.

3.4 Validity and Reliability of Data

Lewis, (1999) describes validity as the degree to which a measurement procedure or a question measures the characteristic it is intended to measure. (Mugenda and Mugenda, 2003) define validity as the degree to which results obtained from an analysis of the data actually represent the phenomenon under study. Sources of information to be used for study were legitimate and this made data collected valid. Data collected was expected to help get regression coefficients of independent variables on dependent variable and Statistical package for social sciences SPSS aided this process.

Expert opinion from the supervisor was also sought to access the validity of data collection instruments used in the study and necessary adjustments made to the data collection form as advised. Miller (2009), defines reliability as the extent to which a questionnaire, test, observation or any other measurement procedure produces the same results on repeated trials which shows stability and consistency of scores over time and across raters. To ensure reliability data was collected from various sources and this made the study feasible.

3.5 Diagnostic Tests

In order to check adequacy of the model to be used to establish the effects of macroeconomic variable on interest rate spread, several diagnostic tests were done on the residual. Normality was tested using the Shapiro-Wilk and Kolmogorov-Smirnov tests. This was aimed at establishing if the residuals will participate in conclusions of the regression model.

3.6 Data Analysis

According to (Mugenda and Mugenda, 2003) data analysis is the process of bringing order, structure and meaning to the mass information collected. In this study, through spreadsheet coding, descriptive statistics was used to present the value of independent and dependent variables in tables and charts. A regression run was done to establish coefficients of independent variables in relation to dependent variable SPSS was used for this purpose. Tables were generated later for easy interpretation and understanding.

The regression model used is

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + e$$

Where;

Y- Interest rate spread (It was measured as the difference in lending and deposit rates average on a quarterly basis)

α- Intercept (constant)

X_1- Central Bank Rate (It was measured as an average quarterly in Central bank rate over the period)

X_2-Exchange Rate (It was measured as a percentage change in real Kenyan Shilling to US Dollar)

X_3-Inflation Rate (It was measured as a percentage change in Consumer Price Index on a quarterly basis)

X_4-Tresuary Bill Rate (It was measured by changes in 90 day Treasury-bill rate over the period of study)

X_5- Gross Domestic Product (Quarterly GDP changes were the unit of measure)

X_6- Repos (Repo rates changes over the period of study were used as a unit of measure)

B_{1-6} –Regression coefficients

e- Error term

3.7 Test of Significance

Analysis of variance ANOVA and T test was used to test the analytical significance of the model. Anova is a statistical technique that examines the variation in the dependent variable as measured by independent variables (Mugenda & Mugenda, 2003). T test was used to test the significance statistics at 5% significance level as well as using the coefficient of determination (R_2).

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter provides descriptive and analytical results and discussion from the study. It describes the performance of IRS over the past 10.5 years since commercial banking sector highly depends on the IRS as a margin measure and therefore act as tool to determine the level of financial intermediation in the country. The chapter discusses the trend of IRS and further evaluates the effect of macroeconomic variables on IRS in Kenya. Finally, findings are drawn from the results to summarize the empirical effect of macroeconomic variables on IRS in commercial banking sector in Kenya.

4.2 Descriptive Statistics

The study purpose was to determine the effect of macroeconomic variables on IRS in the commercial banking sector in Kenya over the in the last ten and a half years. The data was collected as from first quarter of 2006 to the second quarter of 2017 thus the study had 46 study parts. The data was compiled and analyzed in the Statistical Package for Social Sciences. Measures of central tendency (mean) and measure of dispersion (standard deviation) have been used to describe the data. The table below presents a summary of the description of the data used in the analysis.

Table 4.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Statistic
IRS	46	.000	12.170	9.686	1.880
A90DAYST_BILL	46	.000	19.353	8.107	3.363
CBR	46	.000	18.000	9.088	3.327
REPO	46	.000	18.320	6.701	4.198
FOREXKES_USD	46	.000	103.404	81.574	16.693
INFLATION	46	.000	19.186	7.965	4.656
GDP	46	.23	11.60	5.010	2.142

Descriptives

			Statistic	Std. Error
IRS	Mean		9.68637681	.277281582
	95% Confidence Interval for Mean	Lower Bound	9.12790304	
		Upper Bound	10.24485059	
	5% Trimmed Mean		9.89465378	
	Median		9.79500000	
	Variance		3.537	
	Std. Deviation		1.880615190	
	Minimum		.000000	
	Maximum		12.170000	
	Range		12.170000	
	Interquartile Range		1.191667	
	Skewness		-3.232	.350
	Kurtosis		15.573	.688
A90DAYST_BILL	Mean		8.10724638	.495946979
	95% Confidence Interval for Mean	Lower Bound	7.10835788	
		Upper Bound	9.10613487	
	5% Trimmed Mean		7.97831723	
	Median		8.02833333	
	Variance		11.314	
	Std. Deviation		3.363676068	
	Minimum		.000000	
	Maximum		19.353333	
	Range		19.353333	
	Interquartile Range		2.233333	
	Skewness		.726	.350
	Kurtosis		3.055	.688
CBR	Mean		9.08876812	.490649294
	95% Confidence Interval for Mean	Lower Bound	8.10054971	

		Upper Bound	10.07698652	
	5% Trimmed Mean		9.07568438	
	Median		8.79166667	
	Variance		11.074	
	Std. Deviation		3.327745417	
	Minimum		.000000	
	Maximum		18.000000	
	Range		18.000000	
	Interquartile Range		2.000000	
	Skewness		.176	.350
	Kurtosis		2.959	.688
	Mean		6.70155797	.618975734
	95% Confidence Interval for Mean	Lower Bound	5.45487685	
		Upper Bound	7.94823909	
	5% Trimmed Mean		6.48605475	
	Median		7.07000000	
REPO	Variance		17.624	
	Std. Deviation		4.198097679	
	Minimum		.000000	
	Maximum		18.320000	
	Range		18.320000	
	Interquartile Range		3.032083	
	Skewness		.325	.350
	Kurtosis		1.110	.688
	Mean		81.57463768	2.461250448
	95% Confidence Interval for Mean	Lower Bound	76.61742481	
		Upper Bound	86.53185055	
	5% Trimmed Mean		82.92603865	
	Median		84.12950000	
FOREXKES_USD	Variance		278.657	
	Std. Deviation		16.693012710	
	Minimum		.000000	
	Maximum		103.404000	
	Range		103.404000	
	Interquartile Range		17.402000	
	Skewness		-2.500	.350
	Kurtosis		11.847	.688
	Mean		7.96514493	.686594603
	95% Confidence Interval for Mean	Lower Bound	6.58227241	
INFLATION		Upper Bound	9.34801744	
	5% Trimmed Mean		7.71685990	
	Median		6.88666667	

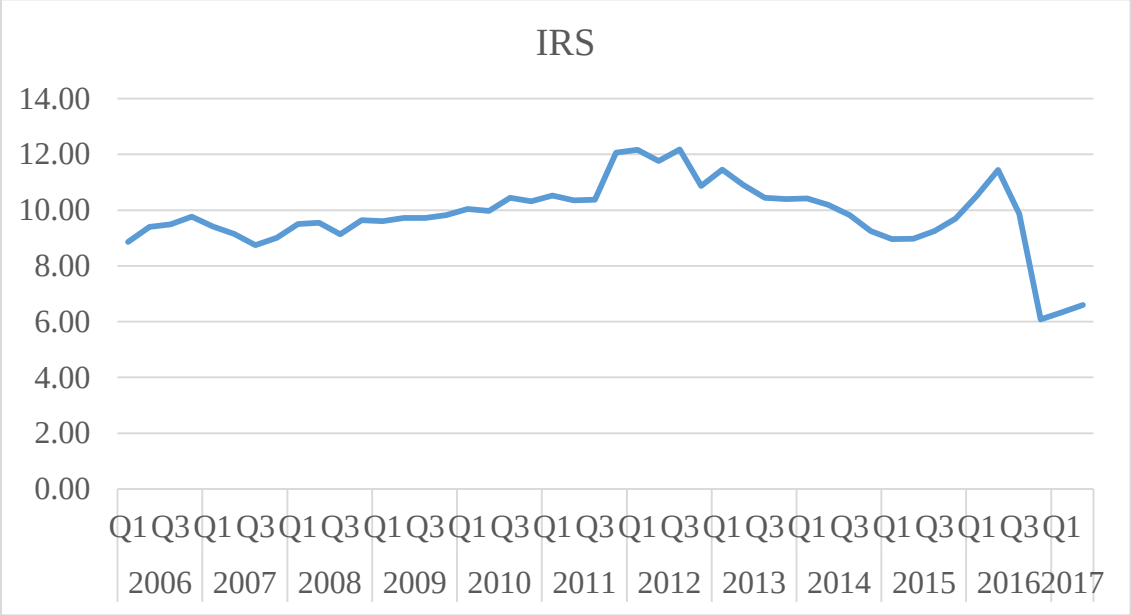
	Variance		21.685	
	Std. Deviation		4.656711164	
	Minimum		.000000	
	Maximum		19.186667	
	Range		19.186667	
	Interquartile Range		4.184167	
	Skewness		1.143	.350
	Kurtosis		.552	.688
	Mean		5.0107	.31583
	95% Confidence Interval for Mean	Lower Bound	4.3745	
		Upper Bound	5.6468	
	5% Trimmed Mean		5.0204	
	Median		5.2500	
GDP	Variance		4.588	
	Std. Deviation		2.14206	
	Minimum		.23	
	Maximum		11.60	
	Range		11.37	
	Interquartile Range		2.09	
	Skewness		-.114	.350
	Kurtosis		1.580	.688

Source; Research data (2017)

As indicated in table 4.1 above, the average mean of the interest rate spread for the ten and a half years is 9.686 with a standard deviation of 1.880, the central bank rate average mean of 9.088 with a standard deviation of 3.327.on the other hand, the inflation rate had an average mean of 7.965 with a standard deviation of 4.656, Treasury bill rate had a mean average of 8.107 with a standard deviation of 3.363, the gross domestic product had a mean of 5.010 with a standard deviation of 2.142, and the repos had a mean average of 6.701 with a standard deviation of and the forex exchange of the shilling to the dollar had a mean average of 81.574 with a deviation of 16.693. This implies that the high rates of exchange, bank rates, inflation rates and the bill rate were mainly due to the global financial crisis of 2007–2008.

The movement in interest rate spread in commercial banking sector in Kenya over the period of study are shown in figure 4.1.

Figure 4.1 Interest Rate Spreads In Kenyan Commercial Banking Sector



Source; Research data (2017)

As shown in figure 4.1, IRS variations have been rising and falling at different times over the period. From 2006 to 2010, IRS was below 10% but rose to high of 12% in 2012. It was then on a falling trend to a spread of about 9% in 2014.It then rose to about 11% in 2016.In 2017, IRS has been at 6% the lowest spread from the study period. This was on the ground of interest rate capping law that was enacted in September 2016 lowering the IRS.

4.3 Normality test

Normality tests conducted on the data of this study are shown in table 4.2 below

Table 4.2: Normality Test

	Kolmogorov-Smirnov[a]				
	Statistic	**df**	**Sig.**	**Statistic**	**Sig.**
IRS	.242	46	.000	.693	.000
A90DAYST_BILL	.183	46	.000	.900	.001
CBR	.177	46	.001	.878	.000
REPO	.172	46	.002	.879	.000
FOREXKES_USD	.126	46	.064	.789	.000
INFLATION	.253	46	.000	.861	.000
GDP	.105	46	.200*	.944	.028

Source; Research data (2017)

Normality tests were done to determine whether the sample data has been drawn from a normally distributed populace. Normality assessment can be done by using a graphical or numerical procedure. The numerical procedures include inferential statistics such as Kolmogorov-Smirnov and Shapiro-Wilk. The Kolmogorov-Smirnov test is considered appropriate for samples larger than 2000 while Shapiro-Wilk test is deemed appropriate for samples ranging from 40 to 2000. In this study, the usable sample was over 46 study periods hence Shapiro-Wilk test was used.

The typicality was tried utilizing the Shapiro-Wilk test which likewise has abiity to recognize take off from ordinariness due to either skewness or kurtosis or both. In the event that measurement ranges from zero to one and figures higher than 0.05 show the information is ordinary (Cooper & Schindler, 1998). Shapiro-Wilk test evaluates whether information is typically circulated against theory that:

H_0: Sample follows a Normal distribution.

$H_{a:}$ Sample does not follow a Normal distribution.

When the p-value is greater than the alpha value, then one fails to reject the null hypothesis and don't accept the alternative hypothesis. From the Shapiro-Wilk test all the value of variables were between zero and one and above 0.05 (IRS= 0.693 A90 days T_BILL=0.9, CBR=0.878, Repo=0.879, Forex KES_USD=0.789, Inflation=0.861, GDP=0.94) hence the data was normally distributed.

4.4 Correlation Analysis

Table 4.3: Residuals Statistics

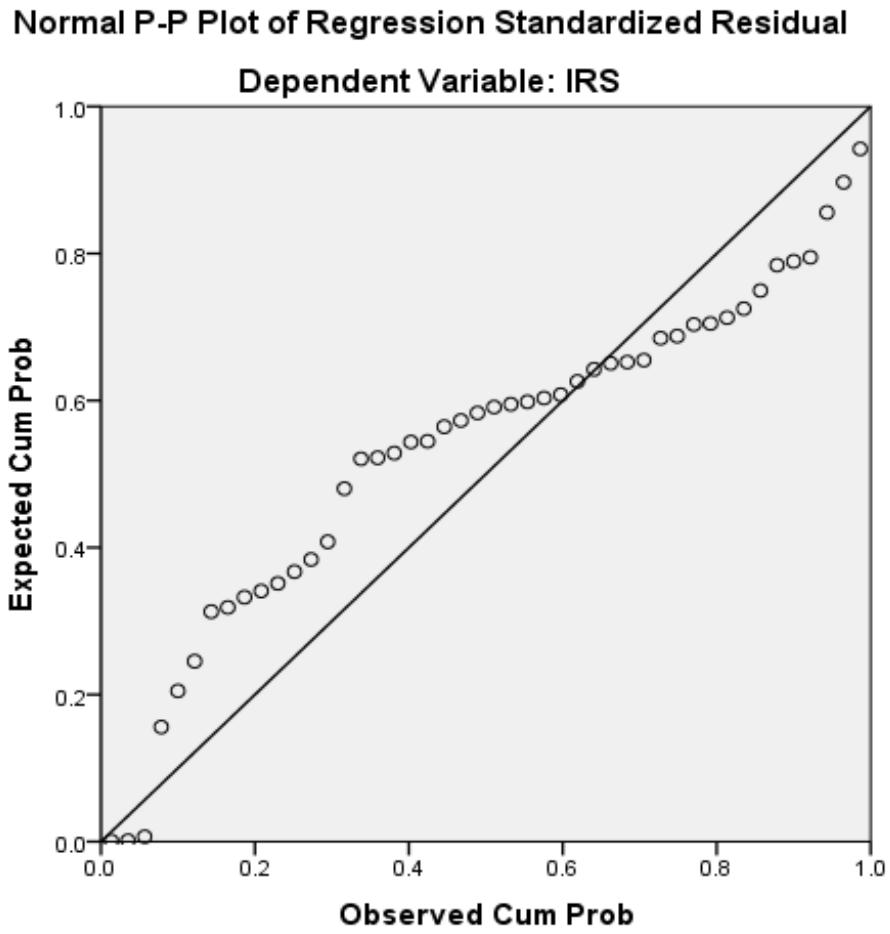
	Minimum	**Maximum**	**Mean**	**Std. Deviation**	**N**
Predicted Value	3.620	11.922	9.686	1.296	46
Residual	-4.647	2.303	.000	1.362	46
Std. Predicted Value	-4.679	1.725	.000	1.000	46
Std. Residual	-3.176	1.574	.000	.931	46

a. Dependent Variable: IRS

Source; Research data (2017)

When performing multiple regression, we assume that the relationship between the response variable and the predictors is linear. If this assumption is violated, the multiple regression will try to fit a straight line to data that do not follow a straight line. To assess linearity, the primary concern is to observe the scatterplot of the standardized residuals with the standardized predicted values.

Figure 4.2: Normal P-P Plot of Regression Standardized Residual



Source; Research data (2017)

From the graph it appears that the relationship of standardized predicted to residuals is roughly linear around zero. We can conclude that the relationship between the response variable and predictors is zero since the residuals seem to be randomly scattered around zero. From the graph the residual trend is centered around zero but also that the variance around zero is scattered uniformly and randomly. We conclude that the linearity assumption is satisfied if we run the fully specified predictive model.

4.5 Regression Analysis and Hypotheses Testing

In this study, a multivariate regression analysis was conducted to test the influence among predictor variables. The research used statistical package for social sciences (SPSS V 21.0) to code, enter and compute the measurements of the multiple regressions.

Table 4.4: Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.689[a]	.475	.395	1.463	.403

a. Predictors: (Constant), central bank rate, capital reserve requirements, inflation rate, Treasury bill rate, gross domestic product and repos

b. Dependent Variable: IRS

Source; Research data (2017)

The study used coefficient of determination to evaluate the model fit. The adjusted R^2, also called the coefficient of multiple determinations, is the percent of the variance in the dependent explained uniquely or jointly by the independent variables.

The model had an average adjusted coefficient of determination (R^2) of 0.395 and which implied that 39.5% of the variations in the interest rate spread are explained by the independent variables understudy (central bank rate, foreign exchange rate, inflation rate, Treasury bill rate, gross domestic product and repos). The study further tested the significance of the model by use of ANOVA technique. The findings are tabulated in table 4.5.

Table 4.5: Anova

Model		Sum of Squares	df	Mean Square	T	Sig.
1	Regression	75.646	6	12.608	5.888	.000[b]
	Residual	83.506	40	2.141		
	Total	159.152	46			

a. Dependent Variable: IRS

b. Predictors: (Constant), central bank rate, capital reserve requirements, inflation rate, Treasury bill rate, gross domestic product and repos

Source; Research data (2017)

From the ANOVA statics, the study established the regression model had a significance level of 0.000% which is an indication that the data was ideal for making a conclusion on the population parameters as the value of significance (p-value) was less than 5%. The calculated value was greater than the critical value an indication that central bank rate, foreign exchange rate, inflation rate, Treasury bill rate, gross domestic product and repos all have a significant effects on IRS. The significance value was less than 0.05 indicating that the model was significant.

Table 4.6: Model Coefficients

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	**Std. Error**	**Beta**	**T**	**Sig.**
1	(Constant)	3.557	1.160		3.067	.004
	A90DAYST_BILL	.011	.141	.019	.077	.939
	CBR	.288	.110	.509	2.610	.013
	REPO	-.123	.098	-.276	-1.265	.214
	FOREXKES_USD	.045	.018	.400	2.530	.016
	INFLATION	.064	.055	.159	1.162	.252
	GDP	.013	.118	.014	.108	.915

a. Dependent Variable: IRS

Source; Research data (2017)

As per the SPSS generated output as presented in table 4.6, the equation becomes:

$$\mathbf{Y= 3.557+ 0.011X_1 + 0.288X_2 + (- 0. 123\ X_3) + 0. 045\ X_4 + 0. 064\ X_5 + 0. 013\ X_6}$$

From the regression model obtained above, a unit change in central bank rate, while holding the other factors constant would increase interest rate spread by a factor of 0.011, a unit increase in CBR while holding the other factors constant would lead to an increase in interest rate spread by a factor of 0.288, a unit change in inflation rate while holding the other factors constant would decrease interest rate spread by a factor of 0. 123, a unit change in Treasury bill rate while holding the other factors constant would lead to an increase in interest rate spread by a factor of 0. 045. A unit change in gross domestic product while holding the other factors constant would lead to an increase in interest rate

spread by a factor of 0. 064. A unit change in repos while holding the other factors constant would lead to an increase in Interest rate spread by a factor of 0. 013.

The analysis was undertaken at 5% significance level. The criteria for comparing whether the predictor variables were significant in the model was through comparing the obtained probability value and $\alpha = 0.05$. If the probability value was less than α, then the predictor variable was significant otherwise it was not. The study also established a statistical insignificant negative relationship between repo (β= -0.276, t= -1.265, $p>0.05$) and IRS. The study also established a statistically positive relationship between CBR measured by quarterly Central bank rate (β=0.509, t=2.620, $p<0.05$) and Foreign exchanges measured by KES/USD exchange rate (β=0.400, t=2.530, $p<0.05$). Inflation rate measured by percentage change in consumer price index (β=0.159, t=1.162, $p>0.05$) had a positive insignificant relationship with IRS.

There was also statistically insignificant positive relationship between 90 days T-bill rate measured by 90 day T-bill rates (β=0.019, t=0.077, $p>0.05$) and GDP measured by quarterly GDP changes (β=0.014, t=0.108, $p>0.05$). These results show that 90 days T-bill, CBR, Forex, inflation and GDP a positive relationship with IRS while repo rate has a negative relation with the IRS.

4.6 Discussion of Research Findings

The study analyzed the effect of macroeconomic variables on IRS in commercial banking sector in Kenya. The study established that a unit change in central bank rate, while holding the other factors constant would increase Interest rate spread (beta coefficient value = 0.288). Descriptive results show that central bank rate affects the capability of the banks to transact business because high central bank rate means that borrowers of funds are being charged high interest rates on loans thus in the process decreasing their demands for all the loanable funds. High interest rate spread means that the banks are charging high interest rates on loans thus in the process decreasing their loan customer base. This also indicates that savers are paid low interest rates on their savings and hence reduce the supply of the loanable funds. The findings concurs with the research findings by Ndung'u and Ngugi (2000), that if CBR falls, there is a probability of interest rates charged on loans to fall and this leads to a large credit uptake from banks hence leading to increased economic activity hence growth.

The study also revealed that when Kenyan banks can borrow funds from the central bank at a less expensive rate, they are able to pass savings on to banking customers through lower interest rates charged on personal, corporate or mortgage loans. This creates an economic environment that encourages consumer borrowing and ultimately leads to an increase in consumer spending during the time in which rates are low. The findings agrees with the research findings by Jayaraman and Sharma (2003), that regulators have a major role in ensuring economic stability which it does through its monetary policy decisions.

The study established that foreign exchange rate has a positive significant influence on interest rate spread, test regression results show that a unit increase in Forex KES/USD while holding the other factors constant would lead to an increase in Interest rate spread (Beta coefficient value = 0.045).These findings show that when the local currency is more stable against the world's major currencies, investor confidence increases hence more investments likely to be undertaken locally.

Findings obtained show that that inflation rate has a positive insignificant influence on interest rate spread, test regression results show that a unit increase in inflation while holding the other factors constant would lead to an increase in Interest rate spread (Beta coefficient value = 0.064). These results therefore show that inflation rate have a minimal influence on the interest rate spread of the commercial banks. The findings concur with the research findings by Demirguc-Kunt and Huizinga (1998) that higher inflation rates are associated with low interest rate spread.

The study established that treasury bill has a positive insignificant influence on interest rate spread, test regression results show that a unit increase in capital reserve requirements while holding the other factors constant would lead to an increase in Interest rate spread (Beta coefficient value =0.011). Descriptive results also show that lower T-bill interest rates and yields drop, the more investors are encouraged to look for riskier returns elsewhere in the market. This is particularly true during times when inflation rates are higher than the returns on T-bills, essentially making the real rate of return on T-bills negative. The findings support the research findings by Brock and Franken (2002) that the

main components that influence Treasury interest rate include economic conditions, monetary policies, demand and supply of Treasury bills.

The research established that GDP has a positive insignificant influence on interest rate spread, test regression results show that a unit increase in GDP while holding the other factors constant would lead to an increase in Interest rate spread (Beta coefficient value = 0.013). Descriptive results also show that Slowing GDP growth tends to pull down interest rates, as there is not much demand for capital and consumers are unwilling to take on new debt and may be paying down old debt. Lower interest rates can stimulate GDP growth for the same reasons that higher interest rates reduced growth The findings concurs with the research findings by Were and Wambua (2013), inflation created by the government, results in high bank rates and higher investment. The result of higher investment is higher value addition leading to higher GDP or GDP growth. Once a country achieves high growth it may turn down the inflation by increasing the bank rates. The findings concurs with the research findings by Otuori (2013), that increased interest rate can depress investors for starting new and essential projects and might decrease GDP causing damage to the economy of the country.

The study established that Repos has a negative insignificant influence on interest rate spread, test regression results show that a unit increase in repos while holding the other factors constant would lead to an increase in Interest rate spread (Beta coefficient value = -0.123).

Descriptive results also show that the cut in repo rate likely to lower the cost of borrowing (spread rates) for both individuals and corporates. The findings concur with the research findings by Tofolawel *et. al*. (2008), the reduction in repo rate is likely to improve the availability of funds bringing in more liquidity to the system. The repo rate also likely to have a long-term impact on the interest rates and deposits. The study also noted that a rise or drop in the repo rate can significantly influence inflation investment power.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The objective of this study was to examine the effect of macroeconomic variables on interest rate spread in the commercial banking sector in Kenya. This chapter presents the summary of the findings, conclusions, recommendations and suggestions for further research.

5.2 Summary of Findings

The main objective of this study was to establish in more detail the effect of macroeconomic variables on interest rate spread.in commercial banking sector in Kenya. The study realized a rising trend in the levels of IRS but declined in some periods. After September 2016,the level of spread had remained stable below 6%.This is on the ground of the interest rate capping law that come into effect in the last quarter of 2016 capping the lending rate at CBR plus 4% as lending interest rate. The findings show that the six independent variables (GDP, inflation, CBR ,foreign exchange ,repo and 90 day T-bill) significantly influenced the dependent variable as shown by an R=0.689. The output indicates that the strength of association between the variables is very high (R= 0.475). The independent variables studied, explained only 47.5% of the IRS in the Kenyan banking sector. This therefore mean that other factors not studied in this research contribute 52.5% of the factors that affect the IRS.

5.2.1 Relationship between Central Bank Rate on Interest Rate Spread

The study established that a unit change in central bank rate, while holding the other factors constant would increase Interest rate spread (beta coefficient value = 0.288). Descriptive results show that central bank rate affects the capability of the banks to transact business because high central bank rate means that borrowers of funds are being charged high interest rates on loans thus in the process decreasing their demands for all the loanable funds. High interest rate spread means that the banks are charging high interest rates on loans thus in the process decreasing their loan customer base. This also indicates that savers are paid low interest rates on their savings and hence reduce the supply of the loanable funds. The findings concurs with the research findings by Ndung'u and Ngugi (2000), that if CBLR falls, there is a probability of interest rates charged on loans to fall and this leads to a large credit uptake from banks hence leading to increased economic activity hence growth

The study also revealed that hen Kenyan banks can borrow funds from the central bank at a less expensive rate; they are able to pass savings on to banking customers through lower interest rates charged on mortgage loans. This creates an economic environment that encourages consumer borrowing and ultimately leads to an increase in consumer spending during the time in which rates are low. The findings concurs with the research findings by Jayaraman and Sharma (2003), CBK has a major role in ensuring economic stability which it does through its monetary policy decisions.

5.2.2 Relationship between Inflation Rate and Interest Rate Spread

The study established that inflation rates has a positive significant influenced on interest rate spread, test regression results show that a unit increase in inflation rates requirements while holding the other factors constant would lead to an increase in Interest rate spread (Beta coefficient value = 0.064). These results therefore show that inflation rate have a minimal influence on the interest rate spread of the commercial banks. The findings concur with the research findings by Demirguc-Kunt and Huizinga, 1998). Higher inflation rates are associated with low interest rate spread.

The study also revealed that an increase in anticipated inflation leads to an increase in interest rate spread and when these banking firms approach infinity which is the competitive case, there is no correlation between interest rate spread and inflation because the spread tends towards marginal cost of intermediation as the number of banks increases.

5.2.3 Relationship between Treasury bill Rate and Interest Rate Spread

The study established that treasury bill has a positive significant influenced on interest rate spread, test regression results show that a unit increase in treasury bill while holding the other factors constant would lead to an increase in Interest rate spread (Beta coefficient value = 0.011). Descriptive results also show that lower T-bill interest rates and yields drop, the more investors are encouraged to look for riskier returns elsewhere in the market. This is particularly true during times when inflation rates are higher than the returns on T-bills, essentially making the real rate of return on T-bills negative. The findings support the research findings by Brock and Franken (2002) the main components that influence

Treasury interest rate include economic conditions, monetary policies, demand and supply of TB.

The research also noted that T-bills are more predictably impacted by changes in the central bank rate than other types of government securities. This is because T-bills directly compete with the central bank rate in the market for low-risk, short-term debt instruments. Institutional investors are particularly interested in the difference between the federal funds rate and T-bill yields. The findings support the research findings by Boldbaatar (2006) Treasury bills, bonds directly affect the interest rates spread in that When Treasury yields rise, interest rates rise as well. That's because investors prefer steady and safe investments.

5.2.4 Relationship between GDP and Interest Rate Spread

The study established that GDP has a positive significant influenced on interest rate spread, test regression results show that a unit increase in GDP requirements while holding the other factors constant would lead to an increase in Interest rate spread (Beta coefficient value = 0.013). Descriptive results also show that Slowing GDP growth tends to pull down interest rates, as there is not much demand for capital and consumers are unwilling to take on new debt and may be paying down old debt. Lower interest rates can stimulate GDP growth for the same reasons that higher interest rates reduced growth. The findings concurs with the research findings by Were and Wambua (2013), inflation created by the govt, results in high bank rates and higher investment. The result of higher investment is higher

value addition leading to higher GDP or GDP growth. Once a country achieves high growth it may turn down the inflation by increasing the bank rates.

The study also revealed that s GDP increases so does the interest rate. These two economic components are directly interrelated to each other. For example: An economic progress results to number of investor investing which result in increased amount of load and to meet up lender ask for the higher rate of return. GDP remarkably aid in increasing inflation and sometime the inflation might outpace GDP generating the negative impact of national economy. So, to control the inflation government pose higher interest rate to loans. This interest rate acts as a break to control investors on new investment. The findings concurs with the research findings by Otuori (2013), that increased interest rate can depress investors for starting new and essential projects and might decrease GDP causing damage to the economy of the country.

5.2.5 Relationship between Repos and Interest Rate Spread

The study established that Repos has a negative significant influenced on interest rate spread, test regression results show that a unit increase in Repos while holding the other factors constant would lead to an increase in Interest rate spread (Beta coefficient value = -.123). Descriptive results also show that the cut in repo rate likely to lower the cost of borrowing (spread rates) for both individuals and corporates. The findings concur with the research findings by Tofolawel *et. al*. (2008) that the reduction in repo rate is likely to improve the availability of funds bringing in more liquidity to the system. The repo rate also likely to have a long-term impact on the interest rates and deposits

The study also noted that a rise or drop in the repo rate can significantly influence inflation investment power. A decrease in the repo rate means the commercial banks shortly can borrow more money from CBK at a cheaper rate, meaning lending rates for consumers also decrease; the reduction in the prime lending rate gives investors the opportunity to borrow more money. However, a reduction in the repo rate and a subsequent increase in funds also lead to the Rand becoming more vulnerable to inflation. Findings concur with the research findings by Robinson (2002) if interest rates increase; consumers will have less money to spend, causing the economy to slow and inflation to decrease.

The study established statistically insignificant positive relationship between 90 day T-bill rate and GDP .In order to address the high spread, the government should not focus on these two macro variables. They have less impact on spread contrary to what was proposed in the literature reviewed. This also shows that the government through its open market operations particularly buying and selling of government securities has little impact on the spread. It would be therefore ineffective to control the levels of IRS using open market activities.

5.2.6 Relationship between Foreign Exchange and Interest Rate Spread

This study so as to establish the impact of foreign exchange used the KES/USD rate. The dollar was used being a global currency whose changes affect business fundamentals internationally. Findings of this study that this rate has a statistically significant positive impact on the spread shows that a more stable shilling in relation to major global currencies would lead to a low spread. The government should therefore look at policies likely to

empower the value of the shilling including but not limited increasing the level of exports the country makes.

5.3 Conclusion

This study establishes that interest rate spread in commercial banking sector in Kenya has been on a decline recently, especially after the interest rate capping law was enacted. Generally the study establishes that the 90 days T-bill ,GDP, repos and inflation rates are statistically insignificant in explaining the levels of spread hence they have little impact on the spread. This is in contrary to several past studies. This opens a discussion on the impact of open market activities by the government in lowering the cost of funds in the economy. CBR and foreign exchange rates have a statistically significant impact on the level of spreads. This is in consistent with several past studies done. The government therefore should come up with policies in regards to the above variables to ensure sustainable low spreads are experienced for greater economic growth and financial intermediation.

Based on the study findings the study concludes that central bank rate, capital reserves requirement, inflation rate, Treasury bill and GDP growth have a positive impact on interest rate spread, the study also concludes that Repos has a negative influence on interest rate spread. CBR while holding the other factors constant would lead to an increase in Interest rate spread. It helps convey whether financial institutions have the financial health to withstand financial hardship, that if CBK lending rates falls, there is a probability of interest rates charged on loans to fall and this leads to a large credit uptake from banks hence leading to increased economic activity hence growth, Treasury bills directly affect

the interest rates spread in that when then Treasury yields rise, interest rates rise as well. The study concludes that reduction in repo rate is likely to improve the availability of funds bringing in more liquidity to the system therefore repo rate is likely to have a long-term impact on the interest rates and deposits.

Repos from the findings have a statistically insignificant negative relationship with the spread. This is the rate that the central bank lends funds shortly to commercial banks to control inflation. If this rate is high, the cost of funds available to borrowers is will be lower as commercial banks would prefer to get funds from depositors thereby raising the deposit rate and ultimately lowering the spread. This is a good tool that the government can use to control the level of spread in the economy.

5.4 Recommendations

Some macroeconomic variables used in this study did not influence interest rate spread significantly. The study therefore recommends that other factors both microeconomic and macroeconomic that influence IRS of commercial banking sector be used. This will ensure that appropriate IRS is set for better performance of the sector in availing funds to investors at the optimal cost, this will also lead to increased financial intermediation as more people will be willing to deposit their funds with commercial banks.

The government through the CBK should be more vigilant and dynamic when coming up with policies and regulations of this commercial sector. Particularly when setting the CBR which has found out in this study acts as the main determinant of IRS.

Depositors would be more willing to save more if they are induced to do so based on returns they get. These are the funds to be availed for investments by borrower's hence economic growth. Open market activities done by the government should not be used as major tools for controlling the high cost of funds in the economy as the 90 day T-bill rate from this study has very little impact on the level of spread in commercial banking sector.

The study also recommends that the Government, through the Central Bank of Kenya should be instrumental in developing policies and regulations to guide commercial banks in setting up of optimal interest rate spreads in order to promote loan uptake as well as improve performance of these commercial banks. Increased loan uptake will lead to growth in the economy of the country. In the event of inflation, central banks increase repo rate as this acts as a disincentive for banks to borrow from the central bank. This ultimately reduces the money supply in the economy and thus helps in reducing inflation.

5.5 Limitations of the Study

This study focused on macroeconomic variables and accessed their impact on interest rate spread .However, there are not the only factors likely to impact on IRS. Microeconomic variables of each commercial bank has and impact especially on deposit rates. Data on such factors is not easily and readily available to the public and would require more time to get. The factors used in this study are therefore not exhaustive in explaining the IRS behavior of commercial banking sector. Other macroeconomic factors are also not considered yet they might be vital in explaining IRS.

This study relied on secondary data. This is only viable if the variable under study are absolutely quantitative. IRS depends on other factors especially microeconomic variables which are qualitative and were not able to establish .It would have been more viable to collect data using both secondary and primary methods .Findings of this study are also as accurate as the data analyzed by regression. Only the authenticity of the data was established not the accuracy of the data. Conclusion in regards to the accuracy of the data could not be made and to what extent.

The period of study was also from first quarter in 2006 to the second quarter in 2017. The period is not long enough to show the long run effect of inflation rate on interest rate spread in Kenyan commercial banks.to clearly understand the effect of the studied variables it would need a longer study period. This would lead to more confident comparisons with other economies when doing IRS comparison for better monetary decisions.

5.6 Suggestions for Further Research

Further studies can be done in regards to the this topic by particularly now looking at microeconomic variables of commercial banks and how this affects the aggregate interest rate spreads in the sector. Other macroeconomic variables can be added on those used in this study to clearly determine their effect on IRS.

Due to time constraints and data availability this study focused only on commercial banking sector but a further more detailed study can be done in other lending sectors particularly the SACCOs and microfinance institutions to determine the impact of

macroeconomic variables on their IRS. A regional study across East Africa can also be done to establish the impact of macroeconomic variables on each country's IRS. This should be done through a cross-sectional study.

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APPENDICES

Appendix I: Study Data

		IRS	90 DAYS T-BILL	CBR	REPO	FOREX(KES/USD)	INFLATION	GDP
2006	**Q1**	8.85	7.95	-	7.70	72.10	8.88	2.63
	Q2	9.40	6.88	9.75	6.62	72.16	4.73	4.41
	Q3	9.49	6.10	9.92	5.94	73.13	5.00	4.15
	Q4	9.77	6.32	10.00	6.30	71.01	7.06	0.47
2007	**Q1**	9.41	6.18	10.00	6.63	69.60	3.28	3.29
	Q2	9.14	6.65	9.50	6.98	67.45	2.63	2.31
	Q3	8.74	7.06	8.67	7.50	67.01	5.44	0.60
	Q4	9.01	7.31	8.75	7.00	65.21	5.72	3.78
2008	**Q1**	9.50	7.04	8.75	7.04	67.88	10.63	0.55
	Q2	9.55	7.61	8.83	7.23	62.65	17.53	2.93
	Q3	9.14	7.91	9.00	6.61	68.60	18.06	5.10
	Q4	9.64	8.24	8.83	6.22	77.62	18.70	5.91
2009	**Q1**	9.60	7.77	8.42	4.93	79.58	14.17	6.47
	Q2	9.72	7.37	8.08	5.12	78.45	10.21	6.85
	Q3	9.72	7.26	7.75	-	76.24	7.51	0.23
	Q4	9.82	7.10	7.25	-	75.14	5.65	3.31
2010	**Q1**	10.04	6.25	6.92	-	76.49	5.03	6.60
	Q2	9.97	4.12	6.75	-	78.94	3.68	7.60
	Q3	10.44	1.82	6.00	-	80.93	3.33	7.90
	Q4	10.32	2.20	6.00	-	80.58	3.84	11.60
2011	**Q1**	10.52	2.61	5.83	1.66	82.24	7.05	7.50
	Q2	10.35	5.85	6.08	5.32	86.12	13.16	6.60
	Q3	10.37	10.05	6.50	-	93.01	16.51	6.10
	Q4	12.06	16.41	15.17	18.32	93.87	19.19	4.40
2012	**Q1**	12.16	19.35	18.00	15.83	84.14	16.87	4.20
	Q2	11.77	12.43	18.00	16.68	84.12	11.78	4.30
	Q3	12.17	10.22	15.33	10.79	84.28	6.38	5.00

	Q4	10.87	9.03	11.67	8.14	85.58	3.53	4.70
2013	**Q1**	11.45	8.78	9.50	8.35	86.72	4.08	6.10
	Q2	10.91	8.68	8.83	8.34	84.61	4.37	7.50
	Q3	10.45	8.51	8.50	7.30	87.26	7.00	6.40
	Q4	10.40	9.73	8.50	7.95	85.91	7.42	3.50
2014	**Q1**	10.42	9.13	8.50	6.92	86.33	6.78	5.20
	Q2	10.19	9.14	8.50	7.76	87.25	7.03	6.00
	Q3	9.82	8.82	8.50	7.11	88.24	7.54	4.60
	Q4	9.25	8.63	8.50	8.28	89.88	6.18	5.60
2015	**Q1**	8.97	8.56	8.50	8.01	91.52	5.82	5.80
	Q2	8.98	8.31	9.00	8.86	95.84	6.99	5.60
	Q3	9.25	12.24	11.50	11.20	102.97	6.14	6.10
	Q4	9.70	14.60	11.50	10.37	102.38	7.35	5.50
2016	**Q1**	10.52	10.24	11.50	7.61	101.91	7.02	5.30
	Q2	11.44	8.11	10.83	7.09	101.04	5.52	6.30
	Q3	9.87	7.57	10.17	8.50	101.34	6.33	5.70
	Q4	6.09	8.14	10.00	7.05	101.73	6.50	6.10
2017	**Q1**	6.33	8.64	10.00	9.02	103.40	8.77	4.70
	Q2	6.60	8.64	10.00	4.91	103.36	10.80	5.00