

EFFECT OF INTEREST RATES ON ECONOMIC GROWTH IN KENYA

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DECLARATION

This research project is my original work and has not been presented for a degree in any other University or any other award.

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DEDICATION

A hearty dedication of this project to my wife and daughter who have always supported and inspired me throughout this course.

ACKNOWLEDGEMENT

My Profound Appreciation and regard to Doctor Muthoga Samuel; my Supervisor for the constructive critique, recommendations and guidance in formulating this project. I also extend my immeasurable honour to the Instructors and Auxiliary staff of Kenyatta University Particularly of the Department of Economic Theory for their input, comments, suggestions, ideas and prompt response to queries. Lastly, Gratitude and honour to my colleagues and immediate family for their aid.

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LIST OF ABBREVIATIONS AND ACRONYMS

ARDL	:	Autoregressive distributed lag model
CBK	:	Central Bank of Kenya
CBR	:	Central Bank Rate
COVID-19	:	Coronavirus disease 2019
CRS	:	Constant Returns to Scale
ECM	:	Error Correction Model
ER	:	Exchange Rates
EU	:	European Union
GDP	:	Gross Domestic Product
GMM	:	Generalized Method of Moments
IMF	:	International Monetary Fund
INF	:	Inflation
INR	:	Interest Rate
KNBS	:	Kenya National Bureau of Statistics
LIR	:	Lending Interest Rates
MDG	:	Millennium Development Goals
MPC	:	Monetary Policy Committee
NSE	:	Nairobi Securities Exchange
OECD	:	Organization for Economic Co-operation and Development
OLS	:	Ordinary Least Square
SMEs	:	Small and Medium Enterprises
UN	:	United Nations
US	:	United States
VIF	:	Variance Inflation Factor

OPERATIONAL DEFINITION OF TERMS

- Central bank rate** : This is the rate that central bank lends money to domestic banks in Kenya.
- Economic Growth** : Process in which economic goods and services increases resulting to better living standards and more profits to businesses for a specific time period in Kenya.
- Interest rates** : It represents percentage charged by financial institutions or lenders when they lend money to the debtors in Kenya.
- Lending Interest rates** : This is the percentage that financial institution like commercial banks, microfinance institutions charge while lending money to borrowers in Kenya.
- Inflation** : This is the rate of decrease in value of money resulting from general increase in prices of economic activities in Kenya.
- Exchange rates** : Refers to the price of Kenyan shilling in relation to other countries' currencies.

ABSTRACT

Economic growth for any economy is a prime macroeconomic variable since it is one of the determiners of people's living standards. Positive economic growth reduces poverty, unemployment, improves public services and reduces the debt to GDP ratio. Interest rates have either a direct or indirect effect on a country's economy as it affects both investors, borrowers as well as savings and investments which influences the economy. However, Kenya's ambition of achieving a 10% rate of economic growth in vision 2030 and becoming a middle-income nation has not been a walk in the park. The government institutions are still struggling to achieve their goals and agendas within their long-term development plans encompassed in the "Vision 2030." The country has continued to register low economic growth. The study sought to investigate interest rates effects on Kenyan economic growth. Specifically, the study assessed lending interest rates and central bank rates effects on economic growth. The study reviewed rate of interest classical theory, Solow Growth Model, Keynes Liquidity Preference Theory, loanable funds theory and theory of pricing. Research Design embraced in the study was longitudinal. This study was anchored on Solow's Growth model. Data on central bank rates, lending interest rates and growth in the economy were obtained from Central Bank of Kenya ranging from 2001 to 2020. Appropriateness of data was assessed through diagnostic tests which included multicollinearity, heteroscedasticity and autocorrelation in regard to regression analysis assumptions. Descriptive statistics such as central tendency measures, correlation, inferential statistics and regression analysis were involved in the analysis of Data. The study would benefit the Kenyan government, Central Bank of Kenya, commercial banks, Scholars and future researchers. The diagnostic tests established that data did not suffer from heteroscedasticity, autocorrelation or multicollinearity. Findings revealed that commercial banks' lending interest rates during study period was higher than the rates by central bank. The results showed that lending rate of interest depicted a positive but statistically insignificant link to GDP while central bank rates results depicted a positive and statistically significant link to GDP. The combined model results however showed that the model is significant hence interest rates significantly affect economic growth. Following study's findings, a conclusion drawn was that effects of interest rates on growth in the economy was significant. The study concludes that commercial banks' lending interest rates depicts positive but have insignificant economic growth effects. In addition, the study concludes that central banks rates have a positive effects and affects economic growth significantly.

CHAPTER ONE

INTRODUCTION

1.1 Background

Interest rates have either a direct or indirect effects on a country's economy as it affects both investors, borrowers as well as savings and investments. Interest rate being an important macroeconomic variable, it affects Country's growth in the economy. Variations in Country's growth in the economy have been experienced in developed and developing nations due to differences in technology growth advancements and growth of industries. (Boldeanu & Constantinescu, 2015). Majority of developing nations in twenty-first century have a lower GDP per capita relative to the nineteenth century Europe's GDP per capita. Economic growth being a peak of twentieth century, it ensured expansion of the Western World's growth raising living conditions of many people. Economic growth encourages investments, raises tax revenues, and boosts investor confidence. Data on economic growth in the world's most industrialized economies show wide variances relative to developing economies (Boldeanu, & Constantinescu, 2015).

Economic growth raises living standards, alleviates absolute poverty and brings rise in life expectancy. Accelerating progress toward the Millennium Development Goals (MDG) requires rapid and sustained growth. Growth has the potential to create wealth and opportunity (OECD, 2008). Through economic growth, population and society income transfer becomes easy. In a dynamic expanding society, redistribution of money is easier in comparison to a rigid society. A high rate of economic growth increases production of services and goods, job opportunities, people's living standards and reduces unemployment rate. (Haller, 2012).

In addition, Economic growth leads to human personality fulfillment, multilateral development, increase in people's material, spiritual prosperity, rise in civilization and culture. Economic growth dictates a progressive social evolution of society which encompasses human conditions improvement based on economic advancement. Economic growth lays the groundwork for a higher standard of living, better medical care, a better educational system, and a more equitable distribution of wealth in society (Anyanwu, Uchenna & Kalu Alexanda, 2015).

For the first (2008-2012) Medium Term Plan of vision 2030, average economic growth rate was 4.18% as compared to a targeted rate of 8.66% while the average investment was 20% of GDP as compared to a targeted rate of 27%. This was influenced by the financial recession of 2009 and post-election violence (Central Bank of Kenya 2020).

The Second Medium Term Plan (2013 - 2017), expected a growth of national investment from 24.7% in 2013 to 30.9% of the GDP in 2017 while expected growth of total national savings was projected to move from 16.4% to 25.7% in the same period but according to National Treasury, national investments expressed as GDP percentage was 21.7%, 23.5% and 23.5% for 2013, 2014 and 2015 years respectively. Economic growth rate during this season was majorly affected by introduction of new governance that was the first to operate under the new 2010 Constitution which repealed old constitution of 1969 that had major changes in governance including but not limited to devolved county governments, independent commissions, bicameral legislative houses, constitutionally tenured judiciary among other institutions (World Bank, 2021). Further, the Total National Savings in 2013, 2014 and 2015 were 12.7%, 14.5 % and 15.9% respectively. (Kenya National Bureau of Statistics 2016). Economic performance from 2015 to 2019 was an average of 5.7% and this was facilitated by strong confidence by investors, macroeconomic environment stability and resilience of the service sector (World Bank, 2020).

However, the economic growth rates for the years 2014, 2015, 2016, 2017, 2018 and 2019 were 5.4%, 5.7%, 5.9%, 4.9%, 6.3% and 5.6% respectively which is still very far from the target of 10% (Central Bank of Kenya, 2020). Several Factors were contributing to the slow rate of economic growth which necessitated this study that assessed effects that interest rates have on Kenyan economic growth.

However, Interest rates had a share of highs and lows where lending interest rates fluctuated from 16.51 in 2014 to 16.09 in 2015 to 16.56% in 2016 and 13.67% in 2017 which resulted from Central Bank of Kenya introducing capped interest rate. (World Bank, 2020). Central bank rate hit the highest in the year 2012 at 15.7% and lowest in 2010 at 6.4%. Commercial banks' lending interest rates was highest in 1999 and 1998 at 22.38% and 22.33% respectively but dropped significantly to 12.53% in 2004. Similar to the central banks rates, the lending interest rates had a sharp rise to 19.65% in 2019 due to the financial stability and resilience experienced by the financial sector during the year (Kenyan Central Bank, 2020). The unbalanced rates of lending and central bank rates could be a source of poor borrowing and low investment which could affect Country's economic growth. Rate of interest is a significant economic variable that affect economy's ability to grow (Lee & Werner, 2018). In fact, interest rates have a direct impact on an economy's essential consumption behaviors, production factors, monetary variables like exchange rates, inflation amongst other variables. This causes disruptions in aggregate supply and demand, which may eventually have an impact on economic growth (Mohanty 2012). Therefore, this study investigated interest rates effects on Kenyan economic growth

1.1.1 Economic Growth

1.1.1.1 Global Perspective

Since financial crisis of 2008-2009 the aftermath has been a slow growth in the global economy (IMF, 2019). In 2019, Economies slowed to a decade-low globally which was triggered by prolonged antagonistic trade disputes and high levels of policy uncertainties (IMF, 2019). These economic growth uncertainties have largely diminished capital goods demand and investment. The global based decline threatens to impede attempts to achieve creation of decent jobs, poverty alleviation and several other sustainable development goals.

East Asia has shown a remarkable growth worldwide, contributing largely to the global growth. Latin America and Caribbean, Output per capita in 2020 was 16.28 percent decline from 2019. Africa near stagnation in GDP per capita has been there for decades, although some countries like Côte D'Ivoire, Ethiopia and Rwanda have shown major improvement (Economic and Social Affairs, United Nations 2020). Global economic growth data shows that the GDP has been declining since the year 2017 to date due to restrained investments. The GDP for the year 2017 was 3.262%, 2018 recorded a drop of 3.098% and in 2019 the GDP declined further to 2.475% (World Bank, 2020). The economic growth for the year 2020 dropped significantly to -2.1% primarily due to the effect of COVID-19 (IMF, 2020).

The growth rate for the advanced economies dropped from 2.5% in 2017 to 2.3% in 2018 and 1.7% in 2019. The US economic growth for 2019 was at 2.3% and was projected to fall to 2.1 by 2020 (IMF, 2020). This was as a result of trade wars between China and United States. In Japan, resilient investment sustained economic growth, whereas the internal demand was more resilient. The weak economic performance of the country reflected weak external demand (United Nations,

2020). The slowest pace in the economy of China has been experienced in 30 years with latest data for the year 2019 showing that the economic growth for the country was 6.1% and fell to 2.2% in 2020 (IMF, 2020) as a result of Covid 19. There has been a growth downgrade in Latin America to 0.8% in 2019 from 1.4% in 2018 (United Nations, 2020). As a result of trade wars between advanced economies like China and United States, the European Union (EU) also registered decline to 1.5% in 2019 from 2.2% in 2018 and 2.8% in 2017 (United Nations 2020).

The figure below shows global economic growth rate.

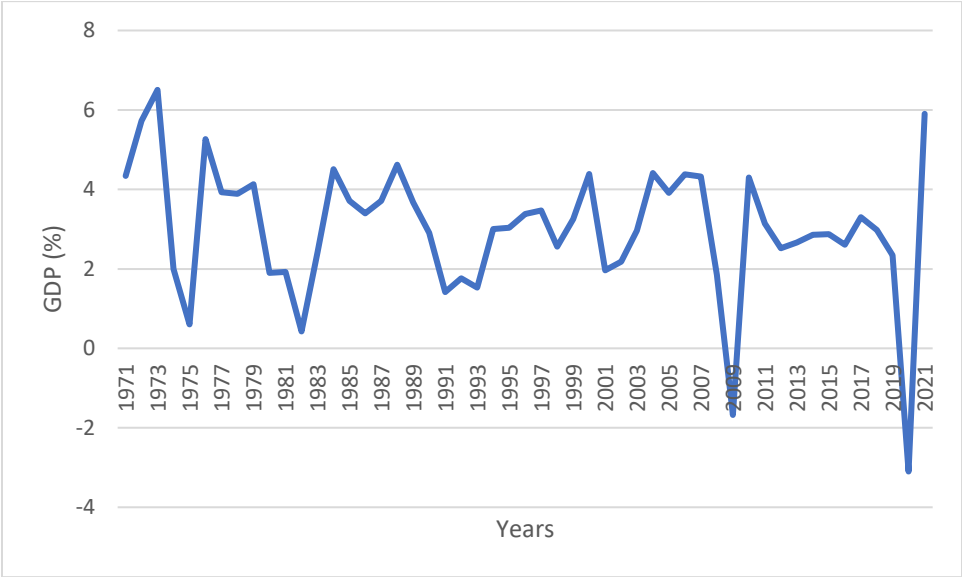


Figure 1.1: Global Economic Growth Rate 1971-2021

Source: World Bank (2022)

Statistics in Figure 1.1 shows that for the last five decades’ global economy has been experiencing inconsistency in economic growth. From the year 1971 and the forthcoming decade, it registered the highest rate at 6.50% in 1973 and lowest at 0.60% in 1975. The rate however grew up to 5.27% in 1976 but the decade closed at 1.90%. The rate continued to drop in the next decade reaching a

low of 0.42% in 1982 but grew to 4.62% in 1988. The next ten years from 1991 started at 1.42% and grew slowly reaching to 4.39% in 2000. However due to 2008 – 2009 worldwide financial crisis, the worldwide economic growth rate dropped to -1.67% in 2009. The last decade however had been at the slowest growth closing at -3.1% in 2020 due to the outbreak of Corona Virus which was a global health issue. At the end of 2021 global economies started recovering slowly with more increased economic activities, abolishment of travel bans across countries that were imposed during Covid period which allowed trade raising the global economic growth to 5.9%. The inconsistency in global economic growth from 1970's resulted from oil prices crises from 1973, short term economic policies embraced by the nations and global pandemics like Covid 19 (United Nations 2020).

1.1.1.2 Regional Perspective

African economic situation has been a challenge notwithstanding global economy meltdown which have affected prices of the commodities and fragilities of economies in some nations. (United Nations 2020). There are extensively divergent situations across sub regions. As East Africa experiences robust economic conditions while North Africa is improving, Southern, West and Central Africa remains insufficient in achieving scaling development challenges. The regional growth in GDP in 2019 was 2.9 percent and was speculated to rise in 2020 and 2021 to 3.2 and 3.5 percent respectively, arising from large downside risks and effective reforms implementation (United Nations, 2020). Achieving a more robust sustainable growth in Africa has been a challenge which has hampered the living standards. More broadly, 0.5 percent in 2010 – 2019 was the average GDP per capita, which in comparison with previous decade was way below, while marginally higher than the 1980s and 1990s. (United Nations, 2020).

Sub Saharan Africa was majorly impacted by COVID-19 pandemic where a 2 percent decline in economic activities was projected. South Africa and Angola being among giant economies in Southern and East Africa projected a 3 percent decline in 2020, which was less by 0.9 percentage as forecasted. Disruption in the tourism sector, lockdowns and temporary tariffs, caused significant economic melt downs in the African Island Countries including Botswana and Namibia while output reduced in mining economies like Mozambique and Zambia. Western and Central Africa's experienced a 1.1 percent decrease in growth in 2020, less than expected, partially due to a less severe decline in Nigeria's economy in remaining part of 2020. A 2.1 percent in 2021 and 3.0 percent in 2022 expansion was expected in the sub region's output (Renzaho, 2020). The economic growth rate for the Sub-Saharan region is shown in Figure 1.2 below.

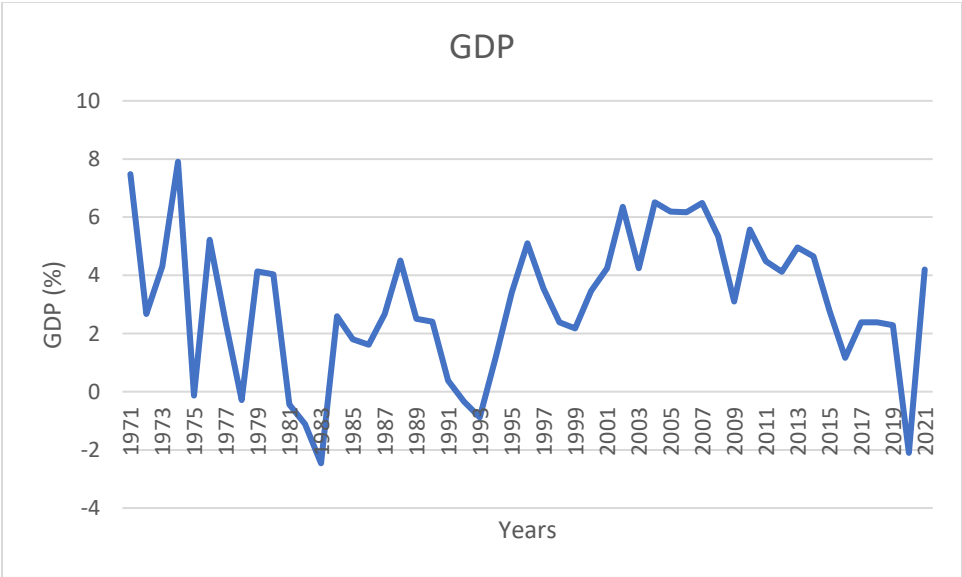


Figure 1.2: Sub-Saharan Economic Growth Rate 1971-2021

Source: World Bank (2022)

The figure above shows that Sub Saharan region economic growth is inconsistent. Starting from the year 1971 the rate of economic growth was 7.48% that dropped to 2.68% in 1972 then up to 7.90% in 1974 but later dropped to -0.13% in 1975. The next five years in the decade also registered highs and lows of economic growth but never reached the highest attained in 1974. As the decade in 1970 was ending, rate of economic growth declined to 4.04%. This continued to drop in the next decade reaching to a low of -2.46% in 1981. The highest rate attained in the decade was 4.51% in 1988. The following decade started by a drop down to -0.34% in 1992 before starting to slowly rise up to 5.1% in 1996. The decade closed at 3.46%. This inconsistent economic growth resulted from inadequate diversification in production, rigid economic policies and concentration of primary raw materials rather than value added products. Although the next decade started by a rise in economic growth the economic recession in the years 2008-2009 hampered this growth which led to a downward trend down to 3.10% in 2009. The region's economy has since then been growing slowly with the 2020 economic growth being at -2.1% due to the emergence of COVID-19 pandemic which has deteriorated the region's economic growth. At the end of 2021 sub Saharan economies started recovering slowly with more increased economic activities, abolishment of travel bans across countries that were imposed during Covid period which allowed trade raising the sub Saharan economic growth to 4.2%.

1.1.1.3 Local Perspective

Kenya's economic growth has been inconsistently rising and falling. The economic growth from the year 1999-2003 was below 5% but increased to 5.1% in the year 2005 where there was a rise up to the year 2007 (World Bank, 2020). The growth for the year 2008 dropped which was largely as a result of post - election violence and peaked on the year 2010 reaching a high of 8.41% but dropped to 4.56 in the year 2012 (World Bank, 2020). The latter years have experienced slight

risers and falls. Unemployment rate in Kenya was highest in 2002 and 2003 at 2.9% and lowest in 2008 at 2.6% (World Bank, 2020). During the period when economic growth was low between 1999-2003, employment rate was at its highest above 2.8% while it consistently and significantly dropped between the years 2013 through 2019 when economic growth was consistently above 5% (World Bank, 2020). Further, between the years 2002-2007, economic growth rose steadily from 0.55% to 6.85% while the debt to GDP ratio dropped steadily from 61.84% to 38.37% (Central Bank of Kenya, 2020). From 2015 to 2019, Kenya experienced an average rate of economic growth of 5.7 percent, putting the country among the rapidly growing nation’s in Sub Saharan Africa. This Kenyan economic performance was aided by a stable macroeconomic environment and positive confidence from investors (Central Bank of Kenya, 2020). The economic growth rate trend for Kenya is as shown in Figure 1.3 below.

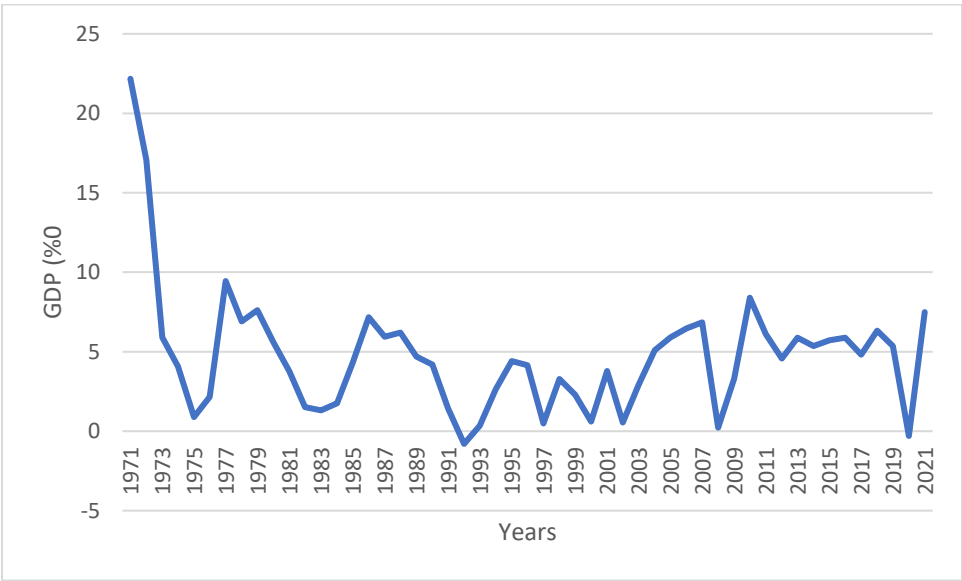


Figure 1.3: Economic Growth Rate for Kenya 1971-2021

Source: World Bank (2022)

The COVID-19 shock and a locust invasion across the country posed a challenge to the Kenyan economic growth as it hampered and to some extent halted several economic activities in the country mostly in 2020 and this resulted to economic growth declining to -0.3% from the previous 5.4% in 2019. This is reflected in 0.3 percent contraction of the real gross domestic product which was triggered by the foreign and domestic fronts shocks in demand and supply (Central Bank of Kenya, 2021). Sectors experienced the impact in different magnitudes with tourism and education sector being badly hit while output in agricultural sector increased and grew. Nonetheless, a considerable economic recovery has been underway as of 2021 with an economic growth rate 7.5%, although some sectors like tourism and education remains severely hampered causing a lot of uncertainty about the future. The Kenyan Tourism sector, inflow of remittances and exports have experienced jeopardy from the pandemic domestic economic activity new disruptions, weather changes, slippages in budget and a weak global economic recovery (World Bank, 2020). Many economies are affected either directly or indirectly by interest rates (Baldwin, 2020). Fluctuations in this macroeconomic variable in major industrial countries causes fluctuations of real output growth in other countries mostly in developing countries (Agénor, McDermott & Prasad, 2000).

1.1.2 Interest rates

Rate of Interest represents reward of lending funds in an economy and it determines the relationship between debtors and creditors. Interest rates are of different types but they are related and linked (Salami, 2018). Interest rates affect both the investors and the borrowers which influences the economy, Interest rate therefore affects both savings and investment and its effect on a country's savings and investment is major (Adelakun, 2015).

Interest rates by financial institutions forms the basis for decisions whether to save or spend money (Mushtaq & Siddiqui, 2016). When interest rates are high, savings will increase as it will lead to increased income while decreased interest rate raises investment within an economy since it lowers the cost of capital. Consequently, the overall economic activities and aggregate demand are impacted by borrowers and savers behaviours arising from investments and consumptions decisions. That is, when we have high interest rate less will be spent, consumption and investment will be less as there will be less borrowing but more money will be saved. (Ayodeji, Osifalajo & Taiwo, 2022). Conversely, when businesses and individual experience low interest rate, the savings reduces as returns from deposits becomes low. On the other hand, low interest rate reduces cost of borrowing where economic agent borrows money raising economic activities as a result of more spending.

According to Khan and Sattar (2014), individuals spend more when interest rates are low which raise services and goods demanded. This increased demand encourages businesses to raise production and hence economic expansion. Mostly, in several nations Central Banks or equivalent government institution is in charge of monitoring the money supply and interest rate and making required policy adjustments. Under interest rate instrument, central bank plays a role of setting an official interest rate that is short term (Muchiri, 2012).

Central Bank's rate in Kenya is the minimum interest rate charged by CBK on credits to banks. CBK Act, requires CBK to issue the CBR which is the minimum interest rate charged to bank loans. Monetary policy committee reviews CBR after two months. For efficiency, certainty, transparency and clarity in policies related to monetary execution, CBR serves as the foundation for all policy activities in monetary policy related operations. CBR is the lowest permissible rate used by CBK when it injects liquidity via a Reverse Repo while on the other side is a maximum

CBK rate in rewarding received bids if it withdraws liquidity via vertical repo. (Central Bank of Kenya, 2020).

In theory, the CBK can influence interest rate direction in one of two ways: – by raising or reducing the CBR rate: By influencing the direction of the treasury bill rate indirectly; When interest rates are too high, a recession and, in extreme situations, deflation can occur, both of which can be economically catastrophic. When interest rates are low, capital is easier to come by. This has the potential to stimulate economic growth (Central Bank of Kenya, 2020). Figure 1.4 presents interest rates for the years 1971 to 2019 in Kenya

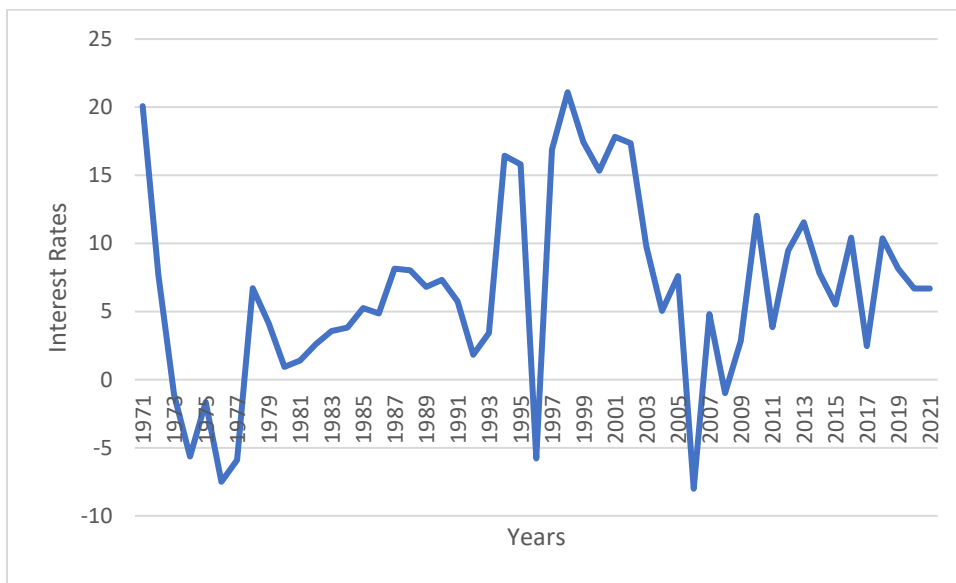


Figure 1.4: Interest Rates for Kenya 1971-2021

Source: World Bank (2022)

Figure 1.4 showed that interest rates in Kenya was high at 20% but dropped drastically to -5% in 1974. There was a slight increase form -5% to 0.5% in 1975 but then a drop was witnessed in 1976 where it went as low as -7.5%. The rise in 1977 was not significant as it only went up to -5%.

Nonetheless, the following two years recorded an upward trend from -5% to 7.5%. A slight decrease was recorded in 1981 after which the country recorded an upward trend in the interest rates up to 8.02 in 1988. The following years also witnessed seasons of rising and falling of the rate of interests but had the highest in 1998 which was 21.09%. The country's interest rates have never rose to this level again and has been experiencing rises and falling with the lowest at-8.0% in 2006. The interest rate for the year 2019 was 8.16% while it reduced further to 6.7% in 2020 and the same rate of 6.7% was maintained in 2021. The increase and decrease of interest rate over time since 1970s resulted from increase in money demand and credit while decrease of interest rate resulted from decreased demand for credit and monetary policies by the central bank like capping interests' rates.

1.1.3 Interest Rates and Economic Growth

Rate of interest is a significant macroeconomic variable that affect economy's ability to grow. The central bank uses it as a tool to manage inflation and promote economic growth (Lee and Werner 2018). If all other variables are held constant, managing and setting rates will bear a notable economic performance. (Irungu 2013),

Poor interest rate decisions have a major impact on the economic indicators across industries, particularly finance related sectors (Salami and Oluseyi 2013). For monetary policy, central bank employs rate of interest as a financial mechanism, which when it increases its own interest rate it signals to other financial institutions such as commercial banks who will follow suit. Since almost all financial institutions are profit-driven, the central bank's high interest rate will force other institutions to charge similarly high rates, which will negatively influence the overall performance of the economy. Banks advance overdrafts and loans to economic agents so as to foster

development plan activities and investments in order to support their own growth as well as national growth (Lekan, Adekola and Braide 2018). Lower rates therefore stimulate the economy and/or inflation, whilst higher rates have a deterrent effect on economy growth.

Studies have demonstrated that lowering rates of interest resulting from expansionary monetary policy may stimulate growth due to an uptick in economic activity, leading to an improvement in economic growth (Jelilov, Waziri & Isik, 2016). However, low economic growth that is possibly brought on by a restrictive monetary policy through a regime of relatively high interest rates might cause a decline in economic growth. (Lee & Werner, 2018).

1.2 Statement of the Problem

Economic activities growth for a nation is a noteworthy macroeconomic variable in determining people's living standards. (Mutinda, 2014). Positive economic growth reduces poverty, unemployment, improves public services and reduces the debt to GDP ratio. Accelerating economic growth also encourages inward investment, leads to improved tax revenues and increases confidence to invest all which improves the standards of living (William & Andrew, 2014). Interest rates have either a direct or indirect effect on a country's economy. Interest rate affects both the investors and the borrowers, savings and investments which influences the economy (Khan & Sattar, 2014).

However, Kenya's ambition of achieving a 10% rate of economic growth in vision 2030 and becoming a middle-income nation has not been a walk in the park. The government institutions are still struggling to achieve their goals and agendas within their long-term development plan encompassed in the "Vision 2030" as the country has continued to register low levels of growth in the country's economy.

A number of studies have been done on interest rates and growth in the economy but have failed to capture various aspects. Mushtaq and Siddiqui (2016) conducted a study on how economic performance in Islamic and Non Islamic economies are affected by interest rates. The study conducted involved Islamic countries which forbids interest rates and it focused more on the effect of the religious guidelines on financial decisions. Drobyshevsky, Trunin, Bogachkova and Sinelnikova - Muryleva (2016) investigated rates of interest effects on growth in the economy. However, the inquiry was conducted in a developed country whose monetary policy vary from the monetary policy adopted in Kenya and hence the rates of interest impacts on growth in the economy may be different. Mutinda (2014) assessed lending rates of interest impacts on Kenyan economic growth. Otieno (2015) studied lending interest rate and Kenyan economic growth. The two inquiries emphasized on lending interest rates while leaving out rate of central bank which determines commercial banks' lending rates and which may contribute to economic performance in the country. The study therefore will fill the gaps above by assessing rates of interest effects on both central bank rate and lending rates by commercial banks on Kenyan economic growth. In particular, the inquiry sought to investigate lending interest rates and central bank rate effects on Kenyan economic growth from 2001 to 2020.

1.3 Research Questions

This study looks for responses to the following questions.

- i. How does lending interest rates affect Kenyan economic growth?
- ii. How do central bank rates affect Kenyan economic growth?

1.4 Objectives of the Study

The general objective of the study was to investigate interest rates effects on Kenyan economic growth.

Specific objectives were;

- i. To investigate lending interest rate effects on Kenyan economic growth.
- ii. To investigate central banks rate effects on Kenyan economic growth.

1.5 Significance of the Study

The Study would benefit several stakeholders. First, Central Bank of Kenya may access study's findings and recommendations for practice on the way forward in formulating country's interest rate related policies. The study might also be of significance to the commercial banks as it will ease their understanding of how rates of interest affects economic growth and therefore come up with regulatory measures that will ensure that the central bank rates as well as the lending interest rates do not impact negatively on economic growth of the country. Scholars and future researcher will also find the study to be of benefit as they would use the study for their empirical review and a source for literature.

1.6 Scope and limitations of the Study

The Study focused on interest rates effects on Kenyan economic growth. The specific focus of study was on central bank rates and lending interest rates. It was done in Kenya where Central Bank data from 2001 to 2020 was used as this period has experienced major constitutional and governance changes. Longitudinal research design was adopted for the study. Major limitation is

that statistics from government institutions may be biased as it may reflect interests of those in power.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter reviews theoretical, empirical literature on interest rates and economic growth as well as overview of existing literature.

2.2 Theoretical Literature Review

Theories under review included: classical interest rate theory, Keynes liquidity preference theory, Theory of Loanable Fund, Theory of Pricing and Solow Growth Model.

2.2.1 Theory of Classical rate of interest

The theory was anchored on ideologies postulated by classical pioneers like Marshall, John Stuart Mill and Pigou who believed in interest rates being a real phenomenon exclusively shaped by real factors like capital supply and demand. Capital supply is manipulated by thrifts like time preference and saving while Capital demand is governed by capital productivity expectations.

The classical pioneers viewed time preference of consumption as a major tool in saving and investment. That is saving meant for investment was available from those who postponed their current income consumption to a date in future hence creating resources to those who wanted to invest.

Rates of interest are viewed as reward of time by the classical proponents due to the nature of current consumption postponement in favour of higher consumption later. Interest rates determines

the motive of saving and consumption. Savings gains higher attractiveness when interest rates are high compared to consumption creating a substantial effect Blanchard (2019).

Fluctuation of rates of interest indicates equity and debt financing substitution. As a result of Competitive returns gained through expansion of equity market, deposit rates in banks increases due to competition of public funds whereas a reduced risk absorption by banks is experienced making banks reduce rates of interest margins due to lending rate competitiveness Blanchard (2019).

2.2.2 Theory of Keynes Liquidity Preference

Keynes (1936) postulated Theory of Keynes Liquidity Preference where rates of interest determination was through money demand and supply. Keynes elaborated that major influence of interest rate is preference in liquidity and not decisions in savings. Money demand implies desire of having money in liquid form and not the desire to borrow money where interest rate is the price for money. The theory posits that as money supply increases, rates of interest reduces leading to increased investment and then higher income.

Keynes advocated that the fundamental way aggregate level of output is impacted by interest rate is via the effects rates of interest have on spending in planned investments as rate of interest is a significant factor in investment demand schedules Keynes (1936). Keynes spearheaded the usage of government monetary policy to influence interest rate though he recognized other powerful macroeconomic variables that influence schedules in investment demand in achieving sufficient investments levels so as to maintain full employment.

Keynes (1937) emphasized on how rates of interest assigns funds available to investment and omitted consumption. When interest rates are low, liquidity available will influence consumption tendencies. In his view, Keynes proposed a slight monetary policy to influence rates of interest up or down as the desired situation. This resulted from the ideology that speculations will take charge of the market in the direction of expectations and arbitrage rates of interest fluctuations depending on rates expected. Therefore, for markets to have rates of interest in a desired level that is below the rate in the market, an expansion monetary policy will be required.

2.2.3 Theory of Loanable funds

Doctrine of loanable funds (credit) was postulated by its proponent Economist Wicksell and later expounded by Dennis Robertson, Bertil Ohlin in 1930s. It is an improvement of Classical interest theories which ignored the fundamental function of money in investments and saving activities. The theory embraces the distributive role money acts during investments and saving activities resulting to different levels of income.

Loanable funds being total amount of money demanded and supplied in money market at a specific time, interest rate is the price equating credit fund supply and demand. Disparities in credit supply, availability of lending credit funds and credit demand leads to rate of interest fluctuations.

In long run, the theory recognizes that investments and savings determines rates of interest while in short run economic prevalent financial condition determines the rates of interest. Appetite for commercial bank credit is manipulated by rates of interest where demand of credit is affected if

Policy in monetary is stiff as interest rate increases Bernanke (2000). Though interest rate cannot be purely monetary phenomenon, credit has effects on the interest rate the same way policies in

monetary affects it Wray (1992). Critics of loanable fund theory criticizes its combining nature of real factors with monetary factors which seems unrealistic.

2.2.4 Theory of Pricing

According to the theory of pricing, a commodity's price is a result of economic forces like commodity's supply and demand. (Mandel, 1969). Supply and demand relationship is a fundamental determinant on whether prices of economic services and goods will decline or rise.

In a perfect market, supply and demand economic forces will determine equilibrium price in the market Streissler (1990). Price is the services', assets' or goods' monetary value numerically assigned. A downward pressure will be exerted on prices if money supply is in excess while upward pressure on prices will be exerted if demand for money is excess in the market Clarke and Davies (1982)

Rate of interest being the price creditors charge debtors on credit, attainment of rate of interest equilibrium in the market will be influenced by market supply and demand economic forces. This postulation conforms to classical economic theory. In this money market, we have supply and demand side where supply side represents supply of credit while demand side is the demand for credit hence equilibrium interest rate occurs where supply and demand intersect Cumby and Mishkin (1986),

2.2.5 Solow Growth Model

Robert Solow and Treva Swan (1956) developed this long run exogenous growth model where they got their motivation and insight from Keynesian Harrold Dormar Model. The Solow growth model analyses economic growth levels over time in an economy as a result of variations in

advances in technology, saving and growth in population rates. This economic growth model emphasizes on accumulation of capital, labour (expansion in population) and productivity advancement arising from advancement in technology (Daron 2009). Solow growth model depicts aggregate output function mostly of Cobb Douglas nature that predicts the convergence of long run equilibrium in steady state where technological advancement will be the only way to achieve permanent growth. Variations in the long run of population and saving increase, will only have level effects.

The growth in population is constant at rate g . if the current population is N , then the link between the population growth and current population gives us future population $N' = N(1+g)$. where future population is depicted by N' . It assumes Consumers have a fixed proportion of saving (s) in the incomes and consumes the rest hence Equation of the consumer $C = (1 - s) Y$ which links consumption C and Output Y . The Model assumes that economic agents in an economy use similar technology in production their inputs being capital (K) and labour (L). Therefore, equation for the production function will be $Y = aF(K, L)$ which links output level (Y), Labour (L), Capital(K) and a being a measure of productivity.

In addition, a constant return to scale (CRS) production function is assumed by the model which implies that when amount of labour and capital stock is doubled, the output level will be doubled. The model puts more emphasis on more capital that result in increased output per worker rather than capital in aggregate, output, current capital K , future capital stock K' , rate of capital depreciation d and level of capital investment I all of which are tied up via capital accumulation equation. $K' = K(1-d) + I$. (Solow, 1956).

2.3 Empirical Review

2.3.1 Lending Rates of Interest and Economic Growth

Obamuyi (2009) assessed how economic growth in Nigeria was affected by interest rates from 1970 – 2006. To capture short and long run changes in interest rates and economic growth, time series analysis was done where error correction model and co-integration were used and their findings depicted significant impact on economic growth as a result of dynamics of real lending rates.

Mutinda (2014) sought an investigation of lending rate of interest on Kenyan economic growth. A sample size of 10-year period from 2003 – 2012 was used. KNBS and CBK secondary data was quarterly regressed and empirical results indicated a negative link between Kenyan economic growth and rates of interest.

Adede (2015) assessed relationship between lending rates of interest on general Kenyan economic growth. The researcher used causal research design in the analysis of KNBS and CBK secondary data for a period 2000 – 2014. From this sample size of 15years the regressed results established negative link between lending rate of interest and growth in the economy.

Mushtaq and Siddiqui (2016) conducted a study on how economic performance in Islamic and Non Islamic economies are affected by interest rates. It adopted general method of moments(GMM) and random effect of non-Islamic and Islamic countries which were 17 in number respectively for a period of 2005 – 2013. From the analysis, rate of interest indicated positive significant effect of economic performance in Non-Islamic countries while inflation, rate of

interest and investments depicted negative impact on investment in both Islamic and non-Islamic countries.

Hariz et al (2017) did an inquiry on how economic development is impacted by rate of interest in Asian Countries. Through Convenience Sampling Techniques, 20 companies were sampled from 20 different Asian countries from a target population of 48 countries for a period of 2006 – 2015. The study used regression, correlation and descriptive analysis using Eviews software where results found significant negative impact of rate of interest on output.

2.3.2 Central Banks Rates and Economic Growth

Muchiri (2012) investigated how market rate of interest of Kenyan mercantile banks are affected by the Kenyan central bank rates. A correlation study was undertaken in addition of descriptive research adopted. 43 commercial banks registered by CBK by December 2011 was study's population where structured questionnaires were used to collect primary data while secondary data collected was from annual financial statement and CBK. Analysis of data was conducted via SPSS where findings showed that rates of Kenyan Central Bank impacted on Kenyan Commercial banks rate of interest consequently affecting economic growth.

Meshack and Nyamute (2016) determined how Kenyan Commercial banks in the Nairobi security exchange roll are affected by monetary policy. 11 mercantile banks from NSE roll registered by then 30th June 2015 was the target population where descriptive survey was adopted. Data used came from NSE and Kenyan central bank where after analysis, results depicted that tools of monetary policy negatively impacted on NSE listed mercantile banks financial performance.

Naftal Abuya (2018) investigated how monetary policy affects Kenyan retail interest rates from 2003 to 2016. Engle Granger two step Error estimations correction method was adopted. The study established that Kenyan monetary policy effects on retail interest was low hence needed an improvement.

Acha (2018) investigated how Nigerian growth in SMEs was affected by monetary policy from 1986 – 2016. Analysis of data adopted error correction model and exposit facto designs where Johansen test revealed that growth of Nigerian SMEs was slightly affected by monetary policy where this impact on SMEs eventually translate into effects on whole economy growth.

Hawaa Faraj Said (2018) determined how monetary policy affected inflation in Kenyan economy. Analysis of data adopted descriptive statistics using SPSS where descriptive research design was embraced. Significant interrelation between inflation and monetary policy was identified by the researcher hence a conclusion drawn that monetary policy affects inflation.

2.4 Overview of literature

An evaluation of literature review has shown that several studies have tried to investigate how growth in economy is affected by rates of interest either directly or indirectly. Part of studies investigating lending rate of interest effects on economy growth and economic performance established a positive relationship between the study constructs (Obamuyi, 2009) while others identified a negative relationship (Mutinda 2014, Adede 2015, Hariz et al 2017). Other studies identified that Kenyan Central Bank rates influenced Commercial Banks rate of interest (Muchiri 2012) while other scholars identified that mercantile banks performance and rates of central bank had a negative relationship (Meshack and Nyamute 2016), growth of Nigerian SMEs was slightly affected by monetary policy Acha (2018), Kenyan monetary policy effects on retail interest was

low hence needed an improvement. Naftal Abuya (2018) and a significant relationship was identified between the monetary policy and inflation Hawaa Faraj Said (2018). Therefore, impacts of these rates of interest economic growth variables eventually will affect the economic growth. The review of the above studies has revealed gaps that need be addressed. Although the study by Obamuyi (2009), linked interest rates with the growth in the economy, methodology adopted were error correction model and co-integration while Mushtaq and Siddiqui (2016) used GMM to analyze data. The present study will close the gap by using Autoregressive distributed lag model (ARDL). More so, most of the above studies were conducted in other economies and not on the Kenyan economy (Obamuyi 2009, Mushtaq and Siddiqui 2016, Hariz et al 2017). Other studies failed to directly link interest rates with economic growth but assessed interrelations between rates of interest and other economic growth variables. (Muchiri 2012, Meshack and Nyamute 2016, Acha 2018, Hawaa Faraj Said 2018) hence presenting the conceptual gap.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The chapter presents methodology adopted by the study, research design, theoretical framework, model specification, research instruments, measurement and variable definitions, data processing and finally analysis methods.

3.2 Research Design

Study's design outlines the systematic manner in which the research was carried out. The researcher uses this strategy for study elements integration and effective handling of the study's problem. (Labaree, 2013). Longitudinal research design was adopted for the study. A longitudinal study engages observing the behavior of same variables within a certain duration of time. Usage of longitudinal design facilitates causal links establishment of direction and strength as well as patterns changes descriptions where each of the variables is measured for different periods hence enabling researchers track changes of variables over time. The design enables changes of pattern with time by measuring variable variations over time. Longitudinal design of the study was therefore applicable for the study since researcher aimed at collecting data for the study variables over a period of time ranging from 2001 to 2020. The researcher hence established the magnitude and direction of study's responsive and predictor variables relationship by checking changes over the years.

3.3 Theoretical Framework

The study was anchored on an exogenous Solow's Growth model of economic growth that shows economy's output changes due to dynamics of saving rates, rate of growth in population and technological advancements. According to the Solow's Growth model, the growth in population is constant at rate g . if the current population is N , then the link between the population growth and current population gives us future population $N' = N(1+g)$. where future population is depicted by N' hence growth in population equation is presented as:

$$N' = N(1 + g) \dots\dots\dots(3.1)$$

The model assumes Consumers have a constant proportion of saving (s) from their incomes and they consume the rest hence Equation of the consumer $C = (1 - s) Y$ which links consumption C and Output Y

$$C = Y(1 - s) \dots\dots\dots (3.2)$$

The Model further assumes that economic agents in an economy use similar technology in production with capital (K) and labour (L) as inputs. Therefore, equation for the production function will be $Y = aF(K, L)$ which links output level (Y), Labour(L), Capital(K) and a being a measure of productivity.

$$Y = aF(K, L) \dots\dots\dots (3.3)$$

An assumption by the model on capital accumulation with current capital (K), rate of capital depreciation d and level of capital investment I hence future capital stock (K') can be represented by an equation which links future capital stock, capital depreciation rate and investments.

$$K' = K(1-d) + I \dots\dots\dots (3.4)$$

The exogenous economic growth model acknowledges that addition of more inputs (labour and capital) and technological advancement brings growth. It further asserts that capital investment increment leads to a temporary increase in rate of growth. However due to diminishing returns, a decline of marginal product of capital units added is experienced making economy move back to growth path in long run. Therefore, steady state growth rate is only achievable when the growth rate of capital output and labor is same. To raise trend in economic growth, we need increased supply of labour, higher capital and labour productivity level.

Amount of capital that a firm uses has major implications on the economic growth of a nation. When a firm decides to expand its capital, it can do this through several ways which include borrowing from banks or selling bonds and this comes with the liability of paying interests. Therefore, interest rates are a critical factor that determines a firm's decision of acquiring or holding capital and how to finance it. When rates of interest are low, a firm decides to acquire more capital and hold as it leads to more capital with positive net present values. Contrary, when interest rates are high, less capital is acquired bringing about negative net present values. Therefore, interest rates both lending and central bank rates will indirectly affect the economic growth by affecting the amount of capital a firm acquires or holds. Further when rates of interest are low, current consumption will increase while cost of credit will reduce encouraging more productive investments in capital. Due to consumption and investment demand increment, demand for labour increases. When rates of interest are high, consumer spending will reduce as well as less investment will be experienced resulting to low demand for labour. Interest rates therefore affect labour demand by affecting the marginal product of capital.

3.4 Model Specification

Interest rates would affect capital and labour in Solow's growth model while output would be the GDP. Interest rates was broken down into lending rates and central bank rates. The amount of capital that businesses use to produce products and services bears a reasonable effect on economic activities. Capital increase leads to increased marginal product of labour, wages and aggregate output. When a company intends to increase its capital stock, it can finance the purchase of capital via different ways like borrowing money from bank. The interest rate is a crucial consideration when a company decides whether to acquire and maintain capital as well as how to finance capital. Therefore, interest rates would affect both labor and capital, both of which influence output and as a result economic growth.

The price down demand down relationship applied in this model. When commodity's price increases, the demand of the commodity reduces while when commodity's prices reduce, the demand for the commodity increases. The price for acquiring capital in this study is interest rate. Capital demand will be lower as interest rate becomes high contrary to high capital demand when rate of interest is low and this affects economic growth. Capital being a determinant of labour, it finances labour and therefore rates of interest effect on capital will have indirect labour effects. Therefore, variables for this study obtained from the relationship will be lending interest rate and central bank rate which substitutes prices. Control variables for the study will be inflation and exchange rates.

Interest rates affect capital structure by the way it impacts on the capital debt cost. More so labour supply is affected by rate of interest due to its effects on marginal product of capital. Interest rates

in the study will therefore be a determinant of capital as well as labour hence will substitute Labour and capital as determinants of output (economic growth) in the production function equation.

Substituting equation 3.3 above with study variables, lending interest rate, rate of central bank and growth in the economy in which lending interest rate and rate of central bank are determinants of capital and labour (K, L), the following model is derived. $Y = aF(LIR, CBR)$ Where; LIR is Lending Interest Rates, CBR is Central Bank Rates and a represents productivity measure in the economy. Hence the model to be estimated is

$$Y_t = \beta_0 + \beta_1 LIR_t + \beta_2 CBR_t + \beta_3 INF_t + \beta_4 ER_t + e \dots\dots\dots (3.5)$$

Where: LIR_t is a percent of output Lending Rates of Interest, CBR_t is a percent of output Central Bank Rates, β_0 Dependent variable intercept, $\beta_1, \beta_2, \beta_3, \beta_4$ represents explanatory variable's coefficients, INF_t represents inflation, ER_t represents exchange rates, Y_t represents economic growth measured as GDP and e is the standard error

The study's focus was to investigate how economic growth is affected by the rates of interest and hence conceptualizes interest rate as lending interest rates which is interest rates that commercial banks lends money to borrowers and the rate of central bank being the rate central banks extends credit to mercantile banks. Therefore, other factors that affected economic growth in the study were control variables.

Autoregressive distributed lag (ARDL) model was adopted in analysis of study's data as it is a better model for studying short and long run effects by independent variables. ARDL model in nature is an ordinary least square model which can be applied in time series data having mixed order of integration and non-stationarity.

ARDL model facilitated efficient achievement of the study's objectives as data used was collected over time and included the lagged values of the data. The response variable which was economic growth and explanatory variables which included lending rates and central bank rates association was considered to be both presently and historically.

The short run relationship of the model takes the form;

$$W_t = \alpha + \beta S_t + \delta Z_t + \varepsilon_t \dots \dots \dots (3.6)$$

The ARDL model in general form is depicted as;

$$\phi(L)W_t = \alpha + \Psi(L)S_t + u_t \dots \dots \dots (3.7)$$

in which

L represents the lag operator

$\phi(L)$ is an order-p polynomial while $\Psi(L)$ represents an order-q polynomial.

Through expansion of lagged polynomials in equation 3.7

$$w_t = \delta + \phi_1 W_{t-1} + \phi_2 W_{t-2} \dots \dots + \phi_p W_{t-p} + \Psi_0 S_{t-1} + \Psi_1 S_{t-2} + \dots + \Psi_q S_{t-q} + u_t \dots \dots \dots (3.8)$$

In which W_t represent response variable

δ is a constant

ϕ_1 and ϕ_p are coefficients associated with lags of W_t

Ψ_0, Ψ_1 and Ψ_q are the coefficients associated with lags of the independent variables

$St, St - 1$ and $St - q$ are predictor variable

μ_t represent error term

In data analysis there might arise the problem of multicollinearity, heteroscedasticity and autocorrelation. The researcher performed diagnostic tests to determine presence of these problems as discussed below.

3.5 Diagnostic Tests

A thorough Diagnostic procedure to assess data appropriateness regarding regression analysis assumptions was done. Diagnostic tests included; multicollinearity, heteroscedasticity and autocorrelation.

3.5.1 Multicollinearity

Multicollinearity was detected via Variance Inflation Factor. A high VIF exceeding 10 indicates presence of multicollinearity (Aloe, Kim and Thompson 2017). A high VIF exceeding 10 indicates perfect presence of multicollinearity while a VIF of less than 10 and more so close to a VIF of 1 of a given predictor variable indicates collinearity absence between predictor variables. The results tabulated from table 4.2 indicated that all study variables depicted a less than 10 VIF. This was an indication that the data did not suffer from multicollinearity. Hence the data was suitable for carrying out the regression analysis. If multicollinearity was detected, the researcher would have solved the problem by collecting additional data for the affected variable(s).

3.5.2 Heteroscedasticity

Heteroscedasticity was tested through Breusch Pagan test that uses null and alternative hypothesis. The Null hypothesis shows presence of homoscedasticity (that errors have equal variance distribution) while Alternative hypothesis shows presence of heteroscedasticity (that errors do not have equal variance distribution). It measures how errors increase across the dependent variable (Breusch, & Pagan, 1979). Probability value (p Value) for the study variables was 0.3504. Since it was higher than 0.05 significance level, we failed to reject the null hypothesis and concluded that homoscedastic is present. These data hence did not have heteroscedasticity problems and was suitable for regression model analysis. If heteroscedasticity was present weighted least square would be used where more weight is assigned to high quality observations and less weight to the unreliable observations.

3.5.3 Autocorrelation

Autocorrelation was tested through Durbin Watson values ranging from 0 – 4 where a value of 2 and below Predicts no autocorrelation while Durbin Watson values above 2 indicated presence of autocorrelation. Table 4.4 results revealed absence of Autocorrelation as Durbin-Watson value was 1.514 which was less than 2 a value that show no autocorrelation detected. Values 0 – 2 indicates Positive autocorrelation while values 2 – 4 indicates negative autocorrelation. If autocorrelation presence was detected Cochrane-Orcutt transformation would be used to correct it.

3.6 Definition and Measurement of Variables

Central bank rates it is country's borrowing rate in which domestic commercial banks are lend money by Central bank mostly a percentage grand sum of Central bank income.

Economic Growth Process in which economic goods and services increases resulting to better living standards and more profits to businesses over a period of time measured as an output in the economy.

Interest rates It is the percentage charged by financial institutions or lenders when they lend money to the debtors. Interest rates was measured as a relative percentage of national income.

Lending Rates of Interest This is the percentage that financial institution like commercial banks, microfinance institutions charge while lending money to borrowers. It was a percent measure of grand sum of bank income

Inflation This is the rise of prices generally for economic activities affecting consumption behavior by the consumers. It was measured as prices rate of change.

Exchange Rate It is one nation currency rate of change relative to another nations currency where its measurement is bilateral.

3.7 Processing of Data and Analysis

Gathered data was recorded in a designed excel worksheet. The data was then cleaned up and sorted. The researcher put the data into STATA and coded it. Data analysis and summary used descriptive, regression analysis and correlation while direction and strength of responsive and explanatory variables relationship were assessed via correlation and regression analysis respectively.

For the first objective which sought to investigate how Kenya economic growth is affected by lending interest rates, correlation analysis investigated what directional effects of explanatory variables had on responsive variables while regression assessed effects of statistical independent variables on dependent variables. These were then being used to answer the research question by testing the significance level at 95% confidence interval.

The second objective sought an investigation of central banks rates on Kenyan economic growth where correlation analysis assessed two constructs directional relationships. Multiple Regression analysis tested statistical significance level relationship at 95% confidence interval hence helped in answering the research question.

CHAPTER FOUR

EMPIRICAL FINDINGS

4.1 Introduction

The Chapter presents the empirical findings of the study. This is done in line with the study objectives. The chapter first present the results of descriptive statistics and then diagnostic results. The correlation and regression analyses results are also presented.

4.2 Descriptive Statistics

Table 4.1 shows data results summary for descriptive statistics where Mean, Standard Deviation, Minimum and Maximum values are provided.

Table 4.1: Results for Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Lending Interest Rates	20	15.126	2.366272	11.99583	19.66667
Central Bank Rates	20	9.331452	1.956514	6.357143	16.5
Inflation	20	8.06803	2.891993	4.765	14.2775
Exchange Rates	20	85.66871	12.4017	67.31917	106.4508
GDP	20	4.28	2.069732	-.3	8.1

Table 4.1 results showed that lending interest rates in Kenya for the study period between 2001 and 2020 ranged between 11.996 and 19.667. The average lending rate for the period was 15.126 having a 2.366 standard deviation. During the period, central bank rates averaged at 9.331 having a 1.957 standard deviation. Central Bank's Minimum Rate was 6.357 while maximum rate was 16.5. This indicated that the central bank rate for the period was always lower than the commercial banks' lending rates. Average rate of inflation was 8.068 for the same period having a 2.892

standard deviation while minimum and maximum values were 4.765 and 14.278 respectively. This period reported 67.319 and 106.45 being minimum and maximum exchange rates respectively which averaged at 85.669 deviating by 12.402. On the GDP value a measure of growth in the economy, results revealed that the country registered an average of 4.28 economic growth deviating by 2.067 during this period having a minimum value of -3 and maximum value of 8.1.

4.3 Diagnostic Tests Results

The diagnostic test results which were performed prior to testing the regression model included test for multicollinearity, heteroscedasticity and autocorrelation. The test results are as shown herein

4.3.1 Multicollinearity

Table 4.2 presents results of Multicollinearity tested via Variance Inflation Factor (VIF).

Table 4.2: Multicollinearity Test Results

Variable	VIF
Central Bank Rates	1.52
Inflation	1.51
Lending Interest Rates	1.30
Exchange Rates	1.29
Mean VIF	1.40

A high VIF exceeding 10 indicates perfect presence of multicollinearity while a VIF of less than 10 and more so close to a VIF of 1 of a given predictor variable indicates collinearity absence

between predictor variables. The results tabulated from table 4.2 indicated that all study variables depicted a less than 10 VIF. This was an indication that the data did not suffer from multicollinearity.

4.3.2 Heteroscedasticity

Heteroscedasticity was tested by Breusch - Pagan test. Table 4.3 tabulates Heteroscedasticity Results.

Table 4.3: Heteroscedasticity Test Results

Breusch-Pagan / Cook-Weisberg heteroscedasticity test
Ho: Constant variance
Variables: fitted values of GDP
chi2(1) = 0.87
Prob > chi2 = 0.3504

Probability value (p Value) for the study variables was 0.3504. Since the p Value was higher compared to 0.05 significance level, we failed to reject the null hypothesis and concluded that homoscedastic was present. These data did not have heteroscedasticity problems.

4.3.3 Autocorrelation

Autocorrelation in the data for the study variables was tested through the Durbin-Watson test where results were tabulated in Table 4. 4.

Table 4.4: Autocorrelation Test Results

Durbin-Watson	d-statistic(5,	20)	=	1.514551
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Table 4.4 results revealed Autocorrelation absence as Durbin-Watson value was 1.514 which was less than 2 a value that show no autocorrelation detected. Values 0 – 2 indicates Positive autocorrelation while values 2 – 4 indicates negative autocorrelation.

4.4 Correlation Analysis

Response and predictor variables correlation was conducted and table 4.5 tabulates its results.

Table 4.5: Correlation Matrix

	GDP	Lending Rates	Central Rates	inflation	Exchange Rates
GDP	1.0000				
Lending Interest Rates	-0.1853	1.0000			
Central Bank Rates	0.0966	0.4448	1.0000		
Inflation	-0.2498	0.3003	0.4063	1.0000	
Exchange rate	-0.1615	-0.1465	0.0663	-0.3818	1.0000

According to the results as presented in Table 4.5 GDP depicted negative correlation with lending interest rates (correlation coefficient (r) = - 0.1853). This implied that increase by a unit in lending interest rates would decrease GDP by 0.1853. It was however revealed that the correlation between GDP and central bank rate is positive but weak (r = 0.0966). Hence increasing Central bank rate by a unit, would increase GDP by 0.0966. The correlation between inflation and GDP was shown to be negative with a correlation coefficient of -0.2498. Therefore, this depicted that, an increase of inflation by a unit would decrease GDP by 0.2498.

Similarly, correlation between exchange rates and GDP was negative with a coefficient of - 0.1615. This implied that increase of exchange rates by a unit would decrease GDP by 0.1615.

4.5 Regression Results

4.5.1 Test for cointegration

Test for cointegration was conducted using the Bounds test for cointegration

H0 No Existence of Cointegration

H1 Existence of Cointegration

When the value of F statistics test is higher compared to upper bounds (I (1)) critical values, we reject null hypothesis of No Existence of Cointegration and draw a conclusion of Cointegration presence. By rejecting null hypothesis, we assume time series variables will have long run relationships hence estimating a long run Error Correction Model. Contrary, if the F statistics value is lower compared to lower bounds (I (0)) critical values, we fail to reject the null hypothesis of No Existence of Cointegration and draw a conclusion of no presence of Cointegration implying relationship not long run between time series variables. With no Cointegration, we estimate the ARDL Model as in Table 4.6.

Table 4.6: Bounds test for cointegration

	Pesaran/Shin/Smith (2001) ARDL Bounds Test							
	H0: no levels relationship				F = 0.549			
					T = -0.244			
	Critical Values (0.1 - 0.01), F-statistic, Case 3							
	[1_0]	[1_1]	[1_0]	[1_1]	[1_0]	[1_1]	[1_0]	[1_1]
	L_1	L_1	L_05	L_05	L_025	L_025	L_01	L_01
K - 4	2.45	3.52	2.86	4.01	3.25	4.49	3.74	5.06

Since the F statistics test of 0.549 was lower in comparison to lower bounds (I (0)) critical values, we failed to reject the null hypothesis of No Existence of cointegration and concluded that there was no presence of cointegration.

4.5.2 Stationarity Test

This test was done via Augmented Dickey-Fuller test.

Table 4.7: Stationarity Test for GDP

Augmented Dickey - Fuller test for unit root							Number of Obs = 18	
Interpolated Dickey - Fuller								
	Test statistic	1% Critical Value	5% Critical Value	10% Critical Value				
Z(t)	1.105	-2.660	-1.950	-1.600				

Augmented Dickey - Fuller test for unit root							Number of Obs = 17	
Interpolated Dickey - Fuller								
	Test statistic	1% Critical Value	5% Critical Value	10% Critical Value				
Z(t)	-2.095	-2.660	-1.950	-1.600				

Results showed that at first difference the variable GDP was stationary as – 2.095 p Value was less than -1.950 at 0.05 significance level. Hence the ARDL could be performed.

Table 4. 8: Stationarity Test for Lending rates

Augmented Dickey - Fuller test for unit root							Number of Obs = 18	
Interpolated Dickey-Fuller								
	Test statistic	1% Critical Value	5% Critical Value	10% Critical Value				
Z(t)	-1.016	-2.660	-1.950	-1.600				

Augmented Dickey - Fuller test for unit root							Number of Obs = 17	
Interpolated Dickey - Fuller								
	Test statistic	1% Critical Value	5% Critical Value	10% Critical Value				
Z(t)	-3.778	-2.660	-1.950	-1.600				

According to results, at first difference the variable lending rates was stationary as – 3.778 p Value was less than -1.950 at 0.05 significance level. Hence the ARDL could be performed.

Table 4.9: Stationarity Test for Central Bank Rates

Augmented Dickey - Fuller test for unit root		Number of Obs = 18					
		Interpolated Dickey - Fuller					
	Test statistic	1% Critical Value	5% Critical Value	10% Critical Value			
Z(t)	-1.550	-2.660	-1.950	-1.600			

Augmented Dickey - Fuller test for unit root		Number of Obs = 17					
		Interpolated Dickey - Fuller					
	Test statistic	1% Critical Value	5% Critical Value	10% Critical Value			
Z(t)	-5.257	-2.660	-1.950	-1.600			

Results showed that at first difference the variable central bank rate was stationary as – 5.257 p Value was less than -1.950 at 0.05 significance level. Hence the ARDL could be performed.

4.5.3 Lag Length Determination

Table 4. 10: Lag Length Determination

e (lags) [1,5]					
	GDP	Lending Interest rate	Central Bank rates	Inflation	Exchange rates
r1	1	0	0	0	2

The lag length for the dependent variable GDP was 1 and the lag length for the independent variables lending interest rates and central bank rates were 0.

4.5.4 Autoregressive Distributed Lag Model

Since there was no cointegration, a relationship of a long run nature between variables was not confirmed in time series data, hence a short run relationship was tested using Autoregressive

Distributed Lag model to analyze predictor variables effects on the response variables. Predictor variables for the study were lending interest rates and central bank rates while response variable was growth in the economy in terms of GDP as per the results tabulated in Table 4.11.

Table 4.11: ARDL Model Results

F(7, 10)	=	34.27					
Prob > F	=	0.000					
R-squared	=	0.96					
Adj R-squared	=	0.932					
Log likelihood	=	53.225557					
Root MSE	=	0.0169					
GDP	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]	
GDP							
L1.	1.05314	0.100696	10.46	0.000	0.828776	1.277504	
Lending Interest Rates	0.008297	0.002112	3.93	0.003	0.003592	0.013001	
Central Bank Rates	-0.00947	0.002706	-3.5	0.006	-0.0155	-0.00344	
inflation	-1.783378	.2289541	-7.79	0.000	-2.324768	-1.241987	
Exchange rates							
-.	.0051159	.0002155	23.74	0.000	.0046358	.005596	
L1.	-.003813	.0013787	-2.77	0.020	-.0068849	-.0007412	
L2.	-0.06531	0.03923	-1.66	0.127	-0.15272	0.0221	
_cons	-0.11824	0.259425	-0.46	0.658	-0.69628	0.459794	

Table 4.11 results of 0.000 being a p Value for F statistics test implied statistically significant overall model as the p Value is less compared to the 0.05 significance level. 0.96 was the R-squared which depicted that 96% of GDP was explained by the variables lending interest rates, central bank rates, inflation and exchange rates. Further, the relationship between the first lag of GDP and GDP was statistically significant ($p=0.000<0.05$). It was also revealed that a Percentage difference on the GDP first lag increased economic growth (GDP) by 1.05314 Percentage respectively on average at 0.05 statistical significance.

Lending rates of interest and economic growth (GDP) relationship results revealed moderate positive and statistically significant relationship ($\beta_1=0.008297$ $p=0.003$). Therefore, a one percent unit change in lending rate of interest was associated with an increase of 0.008297 percent to the GDP. Central bank rates and economic growth relationship revealed a negative but a significant relationship ($\beta_2= -0.00947$ $p=0.006$). Hence a one percent unit change in central bank rates is associated with a decrease of 0.00947 to the GDP.

The results for inflation and GDP relationship revealed a negative but statistically significant relationship ($\beta_3= -1.783378$ $p=0.000$). Hence a one percent unit change in inflation will decrease GDP by 1.783378 percent. In addition, Exchange rates and GDP relationship revealed a positive and statistically significant relationship ($\beta_4=.0051159$ $p=0.000$). Therefore, this depicts that a one percent change in rate of exchange will increase GDP .0051159 percent. First lag of exchange rates showed a significant relationship whereas the second lag revealed no statistically significant relationship. From the analysis of the data the model with coefficients was.

$$Y=-0.11824+0.008297LIR-0.00947CBR-1.783378INF+.0051159ER$$

Where: LIR represents Lending Interest Rates, CBR represents output Central Bank Rates, INF represents inflation, ER represents exchange rates and Y represents economic growth.

4.6 Discussion of Results

Findings from the study established the following: commercial banks' lending interest rates for the period between 2001 and 2020 was higher than the central bank rates. The GDP during this period was however low with average of 4.28. The combined model results revealed a model which

was significant and predictor variables explained 96% of the GDP. This implied that rates of interest changes significantly affect Kenyan economic growth.

Moreover, findings identified that lending rates of interest and GDP depicted negative correlation. However, regression results revealed a positive and significant effect of lending interest rate on GDP. Although the results showed that increasing the lending interest rates had a positive impact on growth in Kenyan economy, this positive effect of lending rates was arising from the fund's increment available to banks for lending through the interest rates paid. This means that more loans are issued for investment which translates to increased economic growth. More so the banks are able to pay more tax to the government increasing government revenue which is used to finance government projects leading to an increased GDP. These findings concur with the findings by Obamuyi (2009) who found that rate of interest affected economic growth positively. However, findings were contrary to Mutinda (2014) and Adede (2015) who established that lending rates of interest and growth in the economy depicted negative relationship.

Through regression, results revealed that central bank rate and GDP relationship was negative though significant. Implication of this was that increasing central bank rate will lead to a decrease in GDP. In addition, it is seen that central bank rate and GDP relationship is large enough to lead to a change in Kenyan growth in the economy. These findings concurred with Acha (2018) findings who identified that rates of interest impacted on changes in economic growth. More over findings did not fall short of findings by Muchiri (2012), Meshack and Nyamute (2016) who found a negative relationship.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Introduction

The chapter presents summary of the results as discussed in chapter four. It consists of sections on summary of results, Conclusions, Contribution to Knowledge, Policy Implications and Areas of further research.

5.2 Summary

The study's main purpose was to investigate on effects interest rates has on Kenyan growth in the economy. Specifically, it assessed lending interest rates and central bank rates effects on economic growth. The data was obtained for the period from 2001 to 2020 and analyzed through descriptive, correlation and regression analysis. The test for multicollinearity, heteroscedasticity and autocorrelation were also conducted prior to assessing the ARDL model. It was observed that data used never suffered from multicollinearity, heteroscedasticity or autocorrelation.

Results revealed that during the study's period, commercial banks' lending rate of interest was higher than the central bank rates averaging at 15.126 against 9.331 central bank rates. The mean of inflation for the period was 8.068 and the mean of exchange rates for the same period was 85.669 while the mean of the economic growth was 4.28.

The results of the first objective in relation to effect of lending rates of interest on growth in the economy revealed that lending rates of interest and GDP were negatively correlated. However, regression results showed that the relationship between lending rates of interest and GDP was

positive and statistically significant. Second objective results for central bank rates effects on economic growth showed a positive correlation with GDP. However, Regression results between central bank rates and GDP depicted a negative but significant relationship. The combined model results depicted a significant model hence rates of interest affects growth in economy significantly.

The correlation of GDP and inflation was observed to be negative. Similarly, regression analysis revealed a negative and significant relationship among inflation and GDP. Negative correlation was depicted between Exchange rates and GDP. Moreover, the regression results of exchange rates and GDP relationship depicted positive and a significant relationship.

5.3 Conclusions

Based on study's findings, a conclusion is drawn that interest rates effects on growth in the economy is significant. In addition, the study draws a conclusion that commercial banks' lending rate of interest have a positive and significant impact on economic growth. Increasing lending interest rates by commercial banks will steer increase in the economy's GDP and hence translate to an increased economic growth. This is explained in terms of increasing the funds available in the banks due to increased incentive to save to enjoy higher interest rates.

Further the study draws a conclusion that central banks rates bear a negative and impact significantly on growth in the economy. Therefore, increasing central banks' lending rate of interest will decrease the GDP for the country. As a result of this, stalled economic growth for the country will be experienced. Increasing the central bank rates of lending will mean that less loans are advanced hence less money supply for investment leading to a decreased economic growth.

5.4 Contribution to Knowledge

In matters of knowledge contribution, study has identified a significant effect of rates of interest on growth in the economy. The study showed that combined effect of lending interest rates and central bank rates is significant but independently lending interest rates depicted positive and significant effect while central bank rates had negative and significant effect. The study is hence relevant since it provides current knowledge on rates of interest effects on growth in the economy. These findings could therefore be of essence to future researchers for the base of their studies where they will establish gaps that will need to be addressed.

5.5 Policy Implications

Following study's conclusions that combined rates of interest significantly affects growth in the economy, policy makers can therefore adopt the study findings in order to formulate policies that relate to rates of interest and growth of economy for the country. Policy formulators should develop policies that will see adjustment of the central bank rates and commercial bank rates to levels that will lead to increased GDP for the country and hence a better position in terms of economic growth.

Since the study found that commercial banks' lending rate depicts positive effect on growth in the economy, the government formulated policies should control interest's rates charged by mercantile banks to lenders. This will ensure that the banks do not charge exorbitant amount on lenders which might discourage borrowing but at the same time the amount charged should be sustainable for banks to have enough money supply in order to increase their lending capacity for more investments. The government should therefore control the lending interest rates to ensure a stable and growing economy. The government should also come up with measures to increase the supply of money among the banks for borrowers.

The study however found that central bank rates depicted negative effect on growth in the economy. Central bank of Kenya therefore will be encouraged to come up with measures to ensure that the rates charged are not too high scaling down growth in the economy. Government should formulate policies that regulate central bank rates as this will ensure that the rates are able to sustain the operations of the institution while encouraging more borrowing. In addition, government should formulate policies that will guide it to increase its borrowing from commercial banks as opposed to central bank without crowding out the borrowing capacity of other economic agents in the economy as this may lead to increase in commercial bank's money supply.

5.6 Areas for Further Research

The study's main purpose was to investigate on effects interest rates has on Kenyan growth in the economy. Future studies may be conducted on effect of rate of interests on individual sectors in the economy such as SMEs or large enterprises in order to understand how they are affected by interest rates. Moreover, future studies may focus on savings interest rates as opposed to lending rates of interests which may have diverse impacts on economic growth.

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