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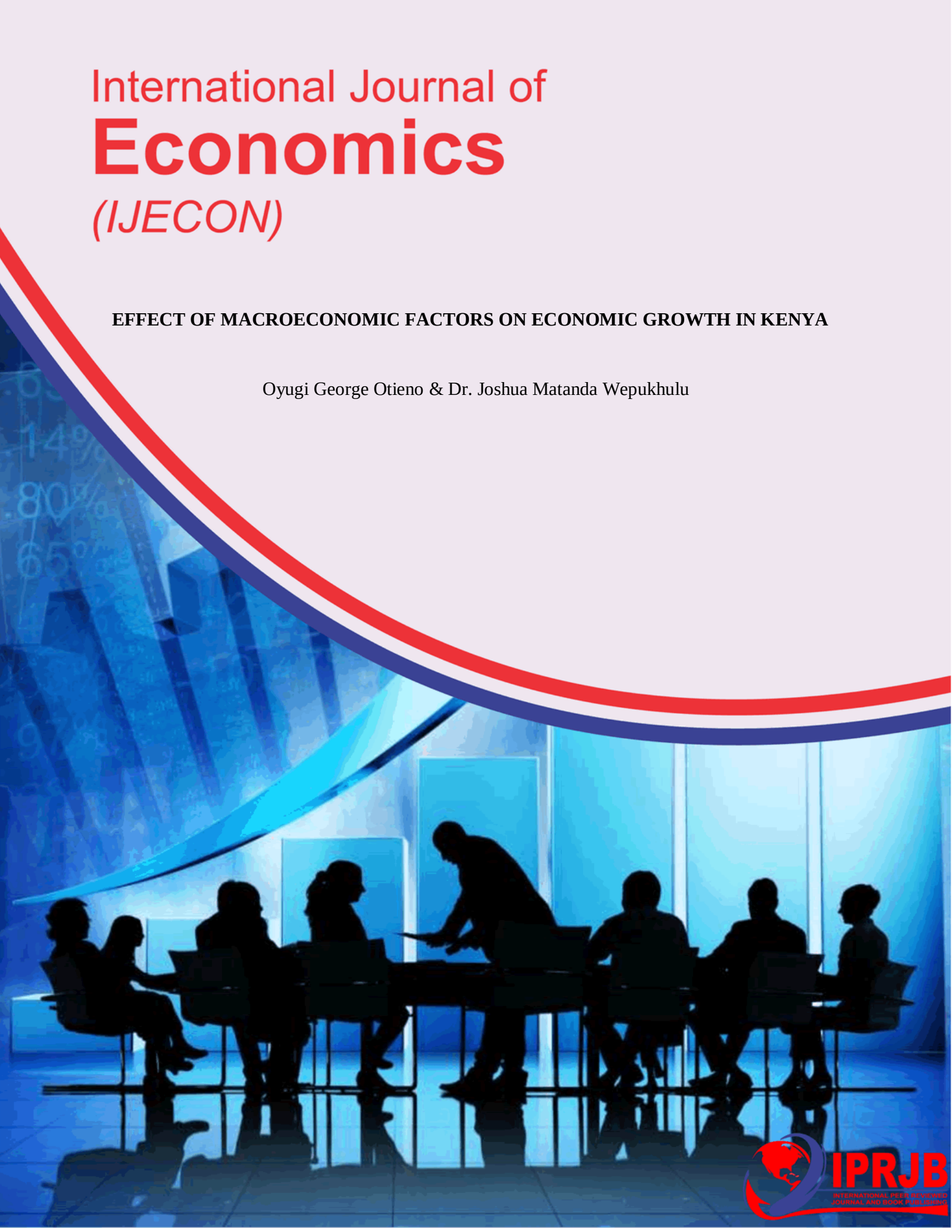

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# EFFECT OF MACROECONOMIC FACTORS ON ECONOMIC GROWTH IN KENYA

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## Abstract

**Purpose:** The main aim of this investigation was to establish the effect of macroeconomic factors on economic growth of Kenya.

**Methodology:** Descriptive research technique was applied. The sampling frame in this investigation was composed of the monetary enumeration of data of the variables under investigation, that is, a list of Inflation, interest rate and exchange rate data obtained from CBK and unemployment list and that of economic growth in terms of GDP obtained from the KNBS for the periods 2008 to 2017. The study utilized the census approach which means that all the data from the sampling frame was used. The gathering point for this research was secondary sources. The data was collected from the Kenya Central Bank's and Kenya National Statistical Bureau's (KNBS) economic reports and documents. The study utilized panel data analysis techniques.

**Findings:** The long run effect was negative but insignificant (β= -0.1211, p=0.3419). While else in the short run the results indicated that interest rate spread was found to positively and insignificantly affect economic growth in the short run. Additionally, in the long run effect, the link between unemployment and economic growth was negative and significant as shown by (β= -3.29756, p=0.0009). However, in the short run, unemployment was also found to have a negative and a significant effect on the economic growth.

**Unique contribution to theory, policy and practice:** The policy makers should set strategic measures that will guarantee stable trade rates in a way that it is going to improve the exports. The government should come up with effective macro-economic policies and ensure improvements in the structure and functioning systems of governance for stabilizing economic growth along with job creation. The government needs to create a conducive environment and flexible labor market policies or legislations that entice many private sector and small businesses which will in turn consolidate the existing entrepreneurship activity with new entrepreneurial entrants so as to create more employment and absorb a large pool of unemployed population.

**Keywords:** *Macroeconomic factors, inflation, interest rate spread, economic growth, exchange rates.*

## 1.0 INTRODUCTION

Macroeconomic variables are outside influence elements that are out of dominance or power of the management of any firm or company. Macroeconomic measures are variables that are in the

external environment and therefore have an indirect effect on the company growth and progress (Nurlaily, Suhadak, Rahardjo & Hsu, 2013). Macro-economic factors include interest rates, exchange rates, money supply, inflation and unemployment. An increase of a country's total output is a measure definition of economic growth (Wambui, 2013). It is a reflection of the value increase or decrease of the total products and services of a country plus the income produced per annum (Bednarczyk, 2014). The country's Growth Domestic Product (GDP) analysis over the years is considered as a measure of the economic performance and growth. Whenever, the economic factors of a country are poor then the progress of economy is limited and at stake (Suheyli, 2015).

Macroeconomic variables are estimates or primary measurements of present economic developments. As with all specialists, the state needs to research, evaluate and comprehend the main factors determining the present conduct of the macroeconomics to do a great job of economic macro management. Thus, the state has to know why and when there are recessions or inflation, and anticipate these developments, as well as the policy mix that will best curb any financial ills.

According to Talvi (2014), all countries around the globe face economic risks, according to his study the likelihood of extreme events is ruled out: the prospect that interest rates in the United states may rise up beyond what is expected; the tenderness of the recuperation in the eurozone may ignite concerns about the feasibility of the euro; possessions and asses prices failing in China to a point of causing financial distress and ultimately causing fall in growth; or emergence of geopolitical tensions which may cause increase in oil costs and a world slump (Talvi, 2014).

It was expected that the United States will grow at a standard rate of 2.7% between the year 2014 and the year 2018, which is close to how the country has performed in the past at 3%, on the other hand, eurozone was expected to have a growth rate below its historical standard. The current output is already significantly below the earlier prediction that was made before the financial calamity, it was noted that monetary policy is highly vitalizing and interest rates are almost zero, the eurozone was not able produce its past average rate of growth and in US it's rarely done. Due to these challenges a debate about "secular stagnation" is on rise: which seems to be the new normal (Talvi, 2014).

The momentum and resilience in African economies have been excellent. This is seen through the real output growth between years 2017 to 2019. Where there was a 3.6 rise in the output growth in 2017 and then went to 4.1 percent in 2018 and 2019. In general, growth recovery in particular among non-resource–intensive nations have been faster than predicted (African Economic Outlook, 2018). This recuperation in growth could be a changing point of net product-exporting nations, among which the prolonged turn down in export costs declined export revenues and caused a rise in macroeconomic imbalances. In these countries though revenues decreased as expenditures increased, there was an increase in current account position as well as inflation in 2017, due to improved policies in exchange rate (African Economic Outlook, 2018).

Overall macroeconomic fundamentals were stable in 2016. Body's mandated to make follow ups on the macroeconomic factors emphasized on exchange rate, fiscal and monetary policies. Policy rate was maintained at 10% to affix inflation at 6.3%, which is a single unit value. Another policy concentrated on putting more money on infrastructural big projects, such a policy is known as a fiscal policy. However, the government spending was so high as well as the mobilization of funds was poorly done which led to a budget deficit of 8% (Muchai, 2016). Further, the ratio of public debt to GDP went to 54%. Debt sustainability as conducted by the International Monetary Fund

assisted the country to manage the debt risks. This was reflected by the improvement in balance of payments deficit which moved from 1.7% in 2016 to 0.6% in, on the basis of improved capital, current, and financial account balances (Government of Kenya, 2017). As a result, the reserves in foreign exchange increased (to 7.8 billion dollars) plus the precautionary arrangement with the IMF totaling up to $1.5 billion, ultimately this was reflected in the stability currency conversion rate (Ndikumana, 2016). Year 2017, the economic progress assessment was assorted. Performance can be likened to the presidential crisis and drought in the same year which caused turbulence in the macroeconomic environment. Inflation went up to approximately 8.8%; deficiency experienced in budgeting was high; on the other hand, the current deficit rose to 5.9% of the overall GDP (Muchai, 2016).

In Kenya 2016, the real economic growth measured in GDP was strong at 5.6% being dictated by services, industry and agriculture. Services contributed 66%, where 56% was attributed to real estate, and 10% to storage and transport services. As for the industry, it contributed 19% of the growth, with 8.2% from the construction sector and 6.2% from the manufacturing sector. Lastly, Agriculture contributed 15% of growth. But in 2017, real economic growth went down recording an estimated 5%, reason being that the credit growth was placated caused by; caps on lending rates by commercial banks, presidential election crisis with prolonged drought. From the estimates of January to June the record shows that the economy remained resilient growing at 4.8%. 82% of the growth can be attributed to Services, 17% to industry; performance of agriculture continued to be poor. Economic growth is predicted to rebound to 5.6% in 2018 and be at 6.2% in 2019 (African Development Bank, 2018).

Ever since the year 2008, the nation of Kenya has experienced growth at a percentage rate 3.5% yearly, this is below the standard growth rate for Sub-Saharan Africa (5.5 percent) with an exception of South Africa. The rate of this growth is remarkably slower than that of its neighboring countries in East Africa, some of which have been ranked as the most developing nations in the world. An example is Rwanda, Uganda, and Tanzania who economically grew at 7.9%, 7.2% and 6.7% respectively between the years 2008 to 2011.

The low growth of economy in Kenya has led the government to have a low tax income, which has caused budget deficits (CBK, 2018). This low rate of growth in the Kenyan economy can be attributed to the turbulent macroeconomic environment in the country over time. For instance, in the period 2008-2011 the average inflation rate was at 11% in Kenya. The unemployment rate was at 10.93% in 2008, which later in year 2011 rose by 1.06% (KNBS, 2011).

Moreover, the interest rate for the periods 2008-2011 was averaged at 14.56%, which is high compared to 13.47% which was the interest rate in the year 2018. During this period (2008-2011) the GDP was captured to grow at a slow rate, while else the Kenyan shilling declined against the US dollar. In the year 2008, the mean exchange rate was 72.91, and it rose to 78.27 in 2009 and to 103.23 in 2018. Recently according to CBK (2019), the Kenyan shilling has declined further against the US dollar; it is now at 100. 890. This investigation focuses on determining whether the aforementioned macroeconomic factors have contributed to the slow rate of the Kenyan economic growth.

Several scholars have investigated the effect of macroeconomic factors like inflation rates, percentage rates of interest and unemployment rate on economic progress and growth but among the conducted studies none have emphasized the overall impact of crucial macroeconomic factors

on Kenyan economic growth. A research conducted on the unemployment rate effect on the South African economy stipulated that the association between progress of the economy and unemployment was negative (Makaringe & Khobai, 2018). However, the findings of South Africa could not be primarily used to make inferences in the context of Kenya due to differences in the economy between the two nations. This is because Kenya is less developed and has a lower economic status compared to South Africa and this could mean possibility of high value of negative but significant unemployment consequences on growth rate of the economy. Jakob (2015) also in his study investigated the influence exchange rate trends and its impact on the progress of the economy. 74 nations were used as the study population. Although, he found out that the measure of growth in the economy and exchange rate regimes are related, this study focused on 74 countries which is quite a high number to really get comprehensive results that can be conclusive for Kenya in this case. In this study, the focus will be Kenya. Further, Misati, Nyamongo and Mwangi (2013) did a research about linkages connecting product prices and both general inflation (non-food and non-fuel inflation), but he failed to show how the inflation affected the economic progress, specifically in Kenya. Therefore, from the three research studies it is perceptible that there is a scarcity of literature that shows the impact of macroeconomic factors on the progress of the economy especially in Kenya. Therefore, this research paper was necessary to reveal the effects that macroeconomic elements had on the economic growth of Kenya.

### 1.2 General Objective

The main aim of this investigation was to establish the effect of macroeconomic factors on economic growth of Kenya. The specific objectives of the study are as follows:

i. To establish the effect of interest rate spread on economic growth of Kenya.
ii. To determine the effect of unemployment on economic growth of Kenya.
iii. To examine the effect of exchange rate on economic growth of Kenya.
iv. To establish the effect of inflation on economic growth of Kenya.

## 2.0 LITERATURE REVIEW

This study was informed by financial intermediation theory, Balance of Payment Theory, the Monetarist Theory of Inflation and Keynesian Theory of Employment.

### 2.1 Theoretical Review

**Financial Intermediation Theory**

This was initiated by Diamond in the year 1984 to expound on how banks function as the connectors between them who deposit and take loans from the bank. The responsibility of the financial institutions is the linkage of finances, is to provide access, monetary diversification and utilization of the finances. The level of inclusion affects the level of stability as supported by literature. Such that Financial intermediation is perceived as the level which financial institutions unite both surplus and deficit spending units together (Ndebbio, 2004).

According to Diamond (1984), banks play the task of monitoring borrowers very well. This is a Comparative advantage because the costs needed for that monitory duty is not incurred. A model by Diamond and Dybrig (1983) in their analysis of the position of liquidity, which involves the change of illiquid assets into liquid liabilities via the banks, investors or depositors that are alike are risk disinclined and seem not to be certain about the time they will need their assets in the

future for consumption. In the absence of an intermediary then all the investors are only limited to illiquid long term investments that are highly beneficial to the individuals who consume in the future.

Financial Intermediation Theory reveals that, risks are mitigated through the spreading and sharing out of the risks between investors which is done by developed financial intermediaries (Acemoglu & Zilibotti, 1997). However, the theory assumes the fact that the risk for producers and investors to raise productions through specialization is too high especially in nations with unproductive financial markets. Another weakness of the theory is that it lacks sufficient reflection of the process of financial intermediation; the theory depends on financial depth indicators in determining the consequences of financial expression on overall growth and progress in an economy which may in turn not give the accurate association (Beck, 2013). Even with the weaknesses the theory remains useful to the current research study since it reveals the effect of percentage rate of interest spread (used as a predictor variable) on growth of the economy.

**Balance of Payment Theory**

In her authoritative 1969 survey of balance of payments theory, Anne Krueger observed that 'there is no theory of international monetary economies', only a cluster of theories bearing on particular aspects of international monetary problems. The position remains the same since Krueger wrote; no all-embracing tightly knit theory has emerged. Despite a great deal of technical sophistication, we are still at the level of 'approaches' (at least three) when it comes to the analysis of international monetary problems. This seems at first sight a trifle odd, since as John Chipman reminds us: 'The emergence of economic science in Great Britain in the seventeenth to nineteenth centuries was to some extent an offshoot of the development of the theory of adjustment of the balance of payments (Mode, 1976).

The theory analysis showed that the authorities must have fiscal or monetary policy to control aggregate domestic expenditure, and devaluation or controls over international trade and payments to control the allocation of domestic and foreign expenditure between domestic and foreign output (Kruger, 1987). Note that, insofar as the authorities maintained exact balance-of-payments equilibrium, actual and desired money holdings would balance and there would be no inconsistency with monetary-theoretic requirements. The theory could therefore be used to explain the influence of domestic and foreign expenditure on foreign exchange and economic growth.

**Keynesian Theory of Employment**

Keynesian theory of unemployment was developed in 1936 by John Keynes. The theory covers the concepts of employment, demand and spending and job creation which is considered as the engine for high demand, and spending leading to more supply which demands more labor. However, the theory has faced criticism by different researchers. Afonso and Sorolla (2012) while analyzing the solutions to explain higher rate of unemployment found that the implementation of Keynessian aggregate expenditure model could destroy the existing jobs. Similar critic was brought up by Straub and Coenen (2005) in their study of establishing whether government spending as the aggregate expenditure components, could crowd-out consumption in the private sector in Europe zone. They realized that government spending do not have significant impact on private consumption.

The money which is spent by the government can only increase the household consumption or be used to subsidize producers which suggest that government spending can improve hiring ability of

the private sector. Additionally, López-Salido and Vallés (2005) found that government spending increased both wages and employment. These controversies around the effect of spending on employment are indications that the Keynesian aggregate expenditure model may work in favour of employment in some countries, while it might be a misfortune for others. This study looked at how unemployment affects the economic growth. According to the Keynesian theory of employment, unemployment is a function of government spending and therefore this theory may be useful in linking government spending, unemployment and economic growth for the study period.

**The Monetarist Theory of Inflation**

This theory argues that, uncontrolled money supply into an economy leads to high inflation levels which are termed as a monetary phenomenon (Friedman, 1956). According to Fischer (1986) the monetary theory of inflation is represented by the equation; MV=PT, where M represents Money Supply, V is money Velocity, P is the price Level and T is the transactions number. As a result of the impossibility that exist in determining the of transactions number (T), it is substituted with (Y) which is the National Income. The new equation becomes MV = PY. This implies that the total cost for goods and services equates to total output always. According to monetarists, excessive pumping of money into an economy leads to inflation. Velocity (V) is considered constant since the number of times employees are paid equates to the money circulation rate in the country. A rise in money supply reveal that consumers have enough money to spend which is the reason why the output of demand has increased causing a demand curve shift. The positive difference between National output and equilibrium creates an inflationary gap. Firms react by hiring more workers rising wages; thus, subsequently leading to increase in costs and prices (Fischer, 1986). So, inflation advances at an analogous pace at which the cash supply develops. In this examination the cumulative supply is believed to be unchanging and that there is sufficient employment in the economy. Typically, when the supply of money develops, it makes more interest in items but it is impossible to increase commodities supply due to the sufficient employment benefits. This prompts increment in costs (Friedman, 1956). This study informs this paper through its explanation as to how inflation arises, which is used as predictor variable in this study.

**2.2 Empirical Review**

**Interest Rate Spread and Economic Growth**

Factors that determine interest rate spread can be specific to one particular bank and at the same time the factors can significantly determine interest rates spread on that bank. This was established by a study Were and Wambua (2014) who conducted a research on the factors determining rates of interest spread with a focus on the Kenyan economy. A sample of 44 banks in Kenya was used in their study. The analysis report found that those factors were individually specific to one given bank significantly impacted the determination of Interest Rate Spread (IRS) in each bank. These specific factors included the size of bank which was seen in terms of its, liquidity risk, credit risk profile, return on average assets, assets portfolio and cost of operation. The research work found that the macroeconomic variables was less significant in the evaluation of their effect on interest rates spread in financial institution. Similarly, it was also found that policy rates have also constructive but fragile effect on the IRS. In a nutshell, the study concluded big banks were found to have larger spreads than the small banks. This study reveals a conceptual gap because its focus was on banks in Kenya and not the Kenyan economic growth which for our case is the aim of our study.

Foreign banks in Uganda have lower interest rates spread as opposed to the indigenous banks. This is a finding by Beck and Hesse (2012) on their research on how interest rate spread influenced the individual banks. Their study failed to realize the reality that there is a relation of interest spread, privatization, Entry of foreign banks, structure of the market and banking efficiency. Additionally, the authors also never found any significant association between IRS and the macroeconomic factors like GDP. The study suffers from contextual gap as it focused on Ugandan economies while this study aims on the Kenyan economy.

Brock and Franken (2013) also did a similar study concerning the interest spread rates, this time the target area being Chile using a two-step procedure. Results of their study showed the following; that concentration in the industry, variables on monetary policy, business cycle variables influenced interest rate spreads differently and this depended on location of computing the spreads either on disaggregated loan and deposit data or on the balance sheet data. In other studies, they came to a conclusion that individual bank features have a tendency of not correlating with the interest rate spreads mainly because they are determined at the industry level. The study reveals contextual gap as it concentrated on Chile economies while the current study will concentrate on Kenyan economies.

**Unemployment and Economic Growth**

Using a data set for 13 years (1996-2009), Kalim (2013) investigated the interconnection that exists between population and unemployment as well as the converse interconnection between growth of economy and unemployment. From the outcomes of his study the two variables, economic and population growth were established to be crucial variables of unemployment in the economy.

A similar study but with different timeline (2001-2011) investigated the drivers of unemployment (Muhammad, 2013). The outcomes showed that the GDP growth rate, and development of the service industry and private sector investment had a greater effect compared to the public sector investment to lessen unemployment. From the point that other macroeconomic variables may affect unemployment, they included population, private investment (PI), economic growth, ED, and FDI as the drivers of unemployment. High unemployment was attributed to the fact that there was low investment and economic growth.

According to a study by Kabaklarli (2011) drivers such as, productivity and inflation were established to positively affect the unemployment level among the youths, while investment and economic growth had negative effects within a long term period of observation. The study used Gross Fixed Capital Formation, Productivity and Price Index as the predictor factors of the study (Eita & Eshipala, 2010).

A long run interconnection exists between growth of an economy and unemployment according to a study by Khobai and Makaringe (2018). They did a study on the way unemployment affected the South African economic. Quarterly data was utilized in their study, that is, 1994Q1 to 2016Q4. Further, their study adopted descriptive design and regression analysis for testing to examine if there existed relationships among the experimental and explanatory variables. From the outcomes of the research a negative association was realized between economic growth rate and unemployment. A recommendation was made by this study to discrete the existing support growth policies from the policies of minimization of unemployment rates reason being that the initial policies depended on government spending but the second policies depended on raising awareness and motivating investment so that more jobs would be created.

**Exchange Rate and Economic Growth**

According to Fetai (2013) in his study of the econometrics results revealed that the macroeconomic stability could be easily disturbed with no significant benefits in the economy if a different strategy to govern exchange rate was introduced as a way of promoting rapid economic growth. On the bases of a long term, the exchange rate coefficient reveals that a change in variation with 1% of the exchange rate causes a hike in prices level of 0.52%, demonstrating that 52% of contrasts in the rate of exchange supply into the price levels. Therefore, the study concluded that introduction of a new strategy of exchange rate would most likely lead to more expenditure than profits.

Kurtishi-Kastrati *et al*., (2016) did a study that focused at examining the influence of exchange rates on the Macedonian level of economic advance. The level at which the exchange rate influences the growth was tested by use of Granger causality test and VAR model. Further, OLS approach was applied to obtain and present the model of regression which was considered to analyze the impact of the exchange rate on the growth of the economy. The research findings implied that exchange rates had a direct and remarkable impact on the Malaysian Economic growth. The argument supported the current regime, that is, the fix regime which supports the macroeconomic stability of Malaysia.

Still in Malaysia, a study was conducted and looked into the influence of exchange rates on the development of the economy. The study used time series data per annum. It was realized that both real and nominal exchange rates had similar impacts on the progress measure of economy growth. The causal effects of both the exchange rates was also found to be the same, this finding was arrived at though the utilization of ECM-based ARDL. The outcomes of the research work concluded that policies of unsystematic exchange rates may cause instability in the economy and may ultimately develop a set of interconnected problems towards the economic growth of a nation (Kogid, Asid, Lily, Mulok & Loganathan, 2012).

Jakob (2015) did a study on consequences of exchange rates systems had on progress of the economy. He used for 74 countries as the study population. He used control variables such as index of human capital per person, inflation rate, index of government spending and gross capital formation (%GDP). From the outcomes of the study it was clear that a direct and remarkable correlation was in existence rate of exchange fluctuation and the impact on the overall economic progress. It was realized the confidence to conduct business in the country was dependent on the stability of the currency, that is, if the currency was stable then the confidence was high and if the currency was unstable then the confidence declined. Therefore, the higher economic output can be produced.

**Inflation and Economic Growth**

Benjamin and Lydia (2012) in assessing on how monetary policy is transmitted in Kenya used quarterly data to estimate a Bayesian vector autoregressive (BVAR) model with the Kalman filter while taking into account a number of analytical innovations and found out that on average, for every 30 basis points of monetary policy tightening using the policy rate, a 1 basis point reduction in the headline consumer price index could be achieved. However, the 30 basis points of monetary policy tightening would also penalize the economy to the level of 0.6 source points of decreased real output.

Ansar and Asghar (2013) did a study that aimed on investigating the relationship of prices of oil on the Pakistan stock market and inflation. Secondary data was obtained of both CPI and KSE-

100 Index was utilized for the years 2007 to 2012. In data analysis, the multiple regression models were utilized in conjunction with the test of Johansen cointegration. This enabled the study to obtain outcomes from the data collected. A conclusion was made that a positive association existed among KSE-100 Index, oil price and CPI. But the association was established to be weak.

The resultant sharp rises in prices of food and oil between 2008 and 2011, led to Misati, Nyamongo and Mwangi (2013) conducting a research on the linkages between product prices and both general inflation (non-food and non-fuel inflation). It was believed that food price and oil prices shocks had a key role in building up of relentless inflationary pressures in Kenyan context. Analysis was done through the use structural vector autoregressive (SVAR) and Granger causality techniques. Food and oil prices were found to have a significant role in predicting inflation. But the effect of oil prices was more persistent on determining inflation than that of food prices. The only gap of left by their investigation is that it did not establish the association that prevail between the rates of inflation and growth and progress in the economy.

Ngwen, Amba Oyon, and Mbratana (2015) paper evaluated the association among inflation, growth abd progress of the economy and government expenditure, in case of Cameroon. The study employed econometric tools to investigate such interconnections between the study elements. The study outcomes revealed occurence of a long run association between growth and progress of economy, expenditure by the government and inflation. Further, the study realized that in the short term both the inflation indicator (CPI) and government disbursements directly affected the progress of the economy. In the long term CPI Granger led to the current government expenditure however no pointer link was noted.

**Critique of the existing literature**

Wambua and Were (2014) did a research on factors determining the Kenyan interest rates spread but this study failed to explain how the interest rates caused variation in the rates of economic growth. Beck and Hesse (2012) on their study investigated the impact of rate of interest spread in Ugandan Economy; however, the research work failed to realize the existence of a strong association between banking efficiency, interest spread, admission of foreign banks privatization, and structure of the market. It also failed to tell the link between economic growth and interest spread.

Kabaklarli (2011) in his study he realized that drivers such as, productivity and inflation were established to positively the unemployment level among the youths, while investment and economic growth had negative effects within a long term period of observation. However, Kabaklarli (2011) used economic growth as the explanatory variable and unemployment rate as the experiment variable, which is opposite of this present study. Ansar and Asghar (2013) did a research that analyzed the effect of oil prices on the Pakistan stock market and inflation. A conclusion was made that a positive association existed among KSE-100 Index, oil price and CPI. However, the relationship was not strong. Kurtishi-Kastrati *et al*. (2016) evaluated the influence of exchange rates on the Macedonian growth rate of economy, the research concluded that exchange rates had a direct and remarkable impact on the Malaysian Economic progress and growth; however, the results of that study cannot be generalized for the Kenyan context bearing in mind that the currencies for Macedonia and Kenyan are different.

## 3.0 METHODOLOGY

In this study, descriptive research technique was applied. This is a technique that describes the findings of a study quantitatively to aid in explaining the association between the variables in the study (Orodho, 2002). Therefore, this particular design is suitable in this particular study that focused on realizing the effect of macroeconomic variables (interest rate spread, unemployment, inflation, and exchange rate) on the Kenyan growth and progress of the economy. This study's target population was the growth and progress of the economy in Kenya from the year 2008 to year 2017. The research population covered data of the independent variables under investigation; unemployment, exchange rate, interests and inflation from 2008 to 2017.

The sampling frame in this investigation was composed of the monetary enumeration of data of the variables under investigation, that is, a list of Inflation, interest rate and exchange rate data obtained from CBK and unemployment list and that of economic growth in terms of GDP obtained from the KNBS for the periods 2008 to 2017. The study utilized the census approach which means that all the data from the sampling frame was used. According to Kothari, (2004), a census is a complete account of all items in the population.

The gathering point for this research was secondary sources. The data was collected from the Kenya Central Bank's and Kenya National Statistical Bureau's (KNBS) economic reports and documents. To assist collection of secondary data, a secondary data model was built. The data included the Central Bank's financial assessments of economic indicators and KNBS information.

The study utilized panel data. The descriptive statistics were calculated and included minimum, mean, standard deviation and maximum. When it comes to inferential statistics correlation and regression was incorporated to determine the impact of macroeconomic elements on the Kenyan economic growth. The collected data was sorted and cleaned to ensure its accuracy and quality. This study analysis was done using SPSS software. The outcomes of the study were then visualized and presented in form of tables and graphs. The following regression model was utilized to show the interconnection that exists between predictor factors and the outcome variable as follows;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where ;

$Y$ = Economic growth (Measured by GDP)

$X_1$ = Interest Rate Spread (Measured by default risk, lending rate and operation costs)

$X_2$ = Unemployment (Measured by unemployed period, real wages and incidence of poverty)

$X_3$ = Exchange Rate (Measured by rate of exchange of Kenya shillings to Chinese Yuan, US Dollar and Euro)

$X_4$ = Inflation (measured by personal consumption index, consumer price index and producer price index).

$\beta_0$ = the constant term while the coefficient $\beta i = 1 \ldots 4$ was used to measure the sensitivity of the outcome variable (Y) to unit change in the predictor variables $X_1$, $X_2$, $X_3$ and $X_4$.

$\varepsilon$ is the error term which represents the unexplained variables outside the model.

## 4.0 EMPIRICAL FINDINGS

### 4.1 Descriptive Statistics

The measures of central tendency of the variables under study are summarized in this section. These variables are; Economic Growth (measured in GDP), Interest rate spread, unemployment, exchange rate and inflation. Table 1 shows the summary of results.

**Table 1: Descriptive Statistics**

| | GDP GROWTH | INFLATION | INTEREST RATE SPREAD | UNEMPLOYMENT | ECHINESE YUAN | EUSD |
|---|---|---|---|---|---|---|
| Mean | 4.80 | 8.37 | 9.33 | 9.54 | 13.65 | 89.00 |
| Median | 5.15 | 7.00 | 9.82 | 9.63 | 14.11 | 86.84 |
| Maximum | 7.50 | 19.20 | 12.17 | 9.79 | 16.45 | 103.89 |
| Minimum | 0.30 | 3.30 | 5.00 | 8.93 | 9.08 | 62.95 |
| Std. Dev. | 1.68 | 4.30 | 2.04 | 0.25 | 1.87 | 11.11 |
| Skewness | -1.04 | 1.08 | -0.95 | -1.35 | -0.70 | -0.24 |
| Kurtosis | 3.51 | 3.04 | 2.85 | 3.80 | 2.58 | 2.19 |
| Jarque-Bera | 8.47 | 8.49 | 6.64 | 14.52 | 3.92 | 1.61 |
| Probabilit | 0.01 | 0.01 | 0.04 | 0.00 | 0.14 | 0.45 |
| Sum | 211.00 | 368.10 | 410.63 | 419.56 | 600.79 | 3916.05 |
| Sum Sq. Dev. | 122.02 | 794.26 | 179.03 | 2.61 | 150.63 | 5305.90 |

The outcomes in the Table 1 conveyed that overall mean of GDP growth was 4.795455% which indicates the average of GDP Growth in Kenya for the last 10 years (2008 - 2018). The median of the GDP Growth was 5.15% implying that half of the observations of the GDP Growth had attained a value 5.15% for the period 2008 and 2018. The GDP standard deviation was 1.684534.

Furthermore, the results above also showed that the average rate of inflation was 8.365909 for the ten years. The median inflation rate was 7 implying that half of the observations in the study had achieved this value for the ten years (2008 - 2018). The standard deviation for the inflation rate was 4.297806.

Further, the average interest rate spread was 9.3325 for the period 2008 to 2018. While else the median was 9.82, an implication that half of the observations between the ten years had achieved the value, 9.82. The standard deviation for the inflation rate was 2.040453.

The results in the above table also conveyed that the average mean of unemployment to be 9.535455% for the period 2008 and 2018. The median for the unemployment was 9.63%, which means that half of the observations had achieved the value for the period 2008 – 2018. The standard deviation was 0.24659.

On the exchange rates, the average mean for the Chinese Yuan was 13.65432, while for the USD was 89.00114. The median for the Chinese Yuan was 14.105, implying that out of all the observations in the period 2008 – 2018 half of them had attained 14.105. As for the USD, the

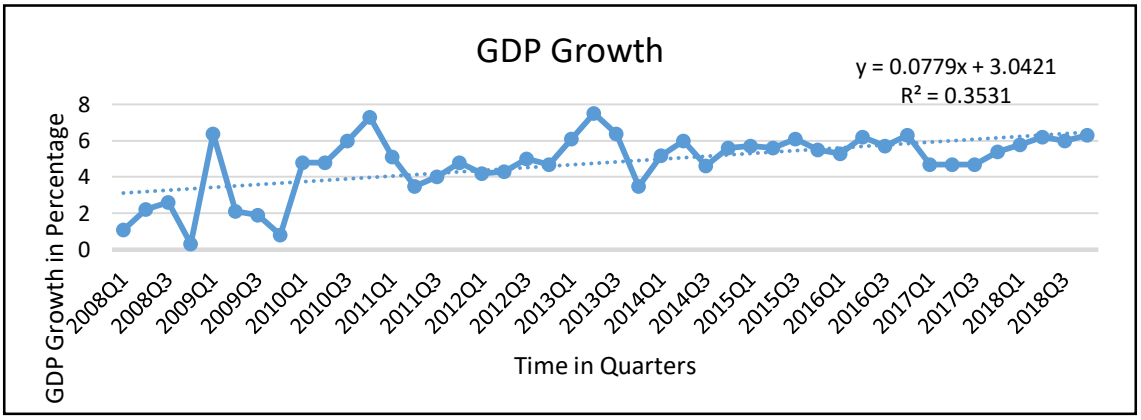
median was 86.835, which means that half the observations had attained this value. Standard deviation for both Chinese Yuan and USD was 1.871615 and 11.10824 respectively.

**Trend Analysis**

**Quarterly Trend Analysis of GDP**

Figure 1 demonstrates the trade analysis of quarterly GDP between the year 2008 and 2018 for Kenya. The trend line shows that the GDP for Kenya has been fluctuating though with a rise in trend values. For instance, in year 2008, the Growth in GDP in the first quarter was recorded to be 1.1% which steadily expanded by 1.5% in the third quarter in the same year but it dropped to 0.3 in the fourth quarter. The fluctuation in the GDP growth can be attributed to the spillover effects of the post-election chaos in Kenya. In 2009, the GDP growth expanded in the first quarter to 6.4% from 1.1% in 2009 same quarter, however, it steadily decreased to 0.8% in the fourth quarter. First quarter GDP growth in 2010 was recorded at 4.8% a decrease by 1.6% from 6.4% same quarter in 2009, the GDP growth expanded throughout the second, third and fourth quarter of 2010 and was recorded at 7.3% in the fourth quarter of 2010. In 2010, the weather conditions were favorable. In 2011, GDP growth in the first quarter was 5.1% better than the GDP growth in the same quarter and the year before, however by the end of 2011 the GDP in the fourth quarter was at 4.8% a drop compared to 7.3% which was the GDP value of the fourth quarter in 2010. The GDP growth in 2012 was stable throughout the year recorded at 4.2% in the initial quarter and 4.7% in the last quarter. In 2013, the first quarter GDP was 6.1 an expansion from 4.2% GDP growth same quarter in 2012, however the growth decreased by 2.6% in the fourth quarter of 2013.

**Figure 1: GDP Growth in Percentage**

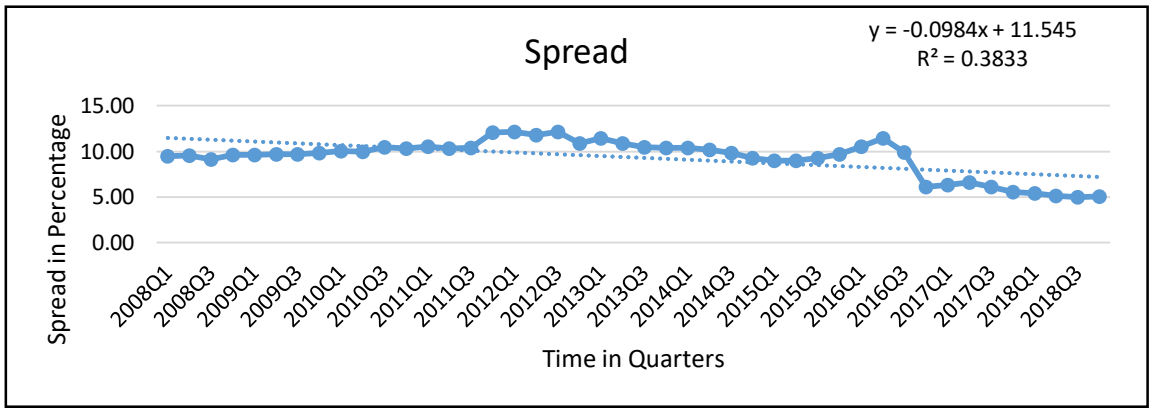



In 2014, GDP first quarter was 5.2% a drop compared to the GDP in the same quarter of 2013, however, GDP growth in the fourth quarter was at 5.6% which was better compared to GDP fourth quarter in 2013, which was 3.5%. The following year the growth in GDP was slightly inclined to 5.7% in the first quarter compared to 5.2% first quarter GDP growth in 2014. Further, the growth in GDP increased in the first quarter of 2016 recorded at 6.1%. In 2017, the GDP growth in the first quarter was 4.7% a drop by 1.4% from 6.1% same quarter in 2016. The growth remained stable throughout both the second and third quarters and inclined to 5.4 in the last quarter of the same year. First quarter 2018 GDP was at 5.8% an improvement from 4.7% from the previous year in the same quarter. From these findings the fluctuation in GDP growth is evident.

**Quarterly Trend Analysis of Interest Rate Spread**

The outcomes in Figure 2 above conveys the trade analysis of quarterly rate of interest spread between the year 2008 and 2018 for Kenya. The trend line shows that this rate spread for Kenya has been fluctuating. The trend is observed to be decreasing. Interest rate spread was recorded at 9.5% in the first quarter of 2008, and at 9.64% in the last quarter of the same year. In 2010, the spread was at 10% in the first quarter an incline by 0.1% from 9.6% in the same quarter in the year 2009. In 2011, the fourth quarter interest rate was at 12.1% an increase by 1.5% from the fourth quarter spread of 9.64% in 2008. In 2012, the fourth quarter spread was at 10.87% a decline from 12.1% in 2011 same quarter. The spread declined further in the fourth quarter of 2013 at 10.45%. In 2014, a significant decline in the interest rate was noted in the third quarter at 9.82 from 10.45% in the year 2013 same quarter. In 2015, a sharp decline in interest rate spread was observed recorded at 6.09 from 9.70% in 2014 same quarter, a further decrease was observed in 2017 at the fourth quarter recorded at 5.58%. In the first quarter of 2018, the interest rate spread was still at 5.58% but later declined to 5.07 in the fourth quarter same year.

**Figure 2: Interest Rate Spread**




**Quarterly Trend Analysis of Unemployment**

The outcomes in Figure 3 demonstrates the trade analysis of quarterly Unemployment rate between the year 2008 and 2018 for Kenya. According to the trend line pattern above, the unemployment rate has been constant for the last ten years. In 2008, the unemployment rate was recorded at 8.93% at the fourth quarter of the year, there was a rise in the rate of unemployment in the following year 2009 where the unemployment rate was recorded at 9.6% in the fourth quarter of 2010. In 2010, the unemployment rate increased to 9.73% in the first quarter all through to the fourth quarter, in 2013 the unemployment rate slightly increased to 9.79% in the first quarter. In the first quarter of 2014, the unemployment rate was 9.59% a drop from 9.79%, and year before still in the first quarter. In 2016, the unemployment rate was at 9.63% in the first quarter dropping to 9.29% in the first quarter of 2017. The unemployment rate in 2018 first quarter was recorded at 9.31% remaining constant in the second, third and fourth quarter.

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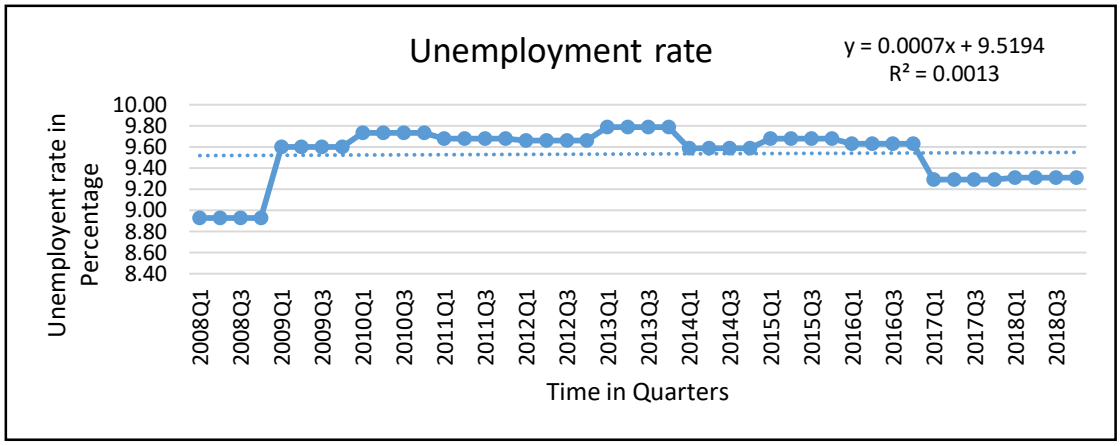
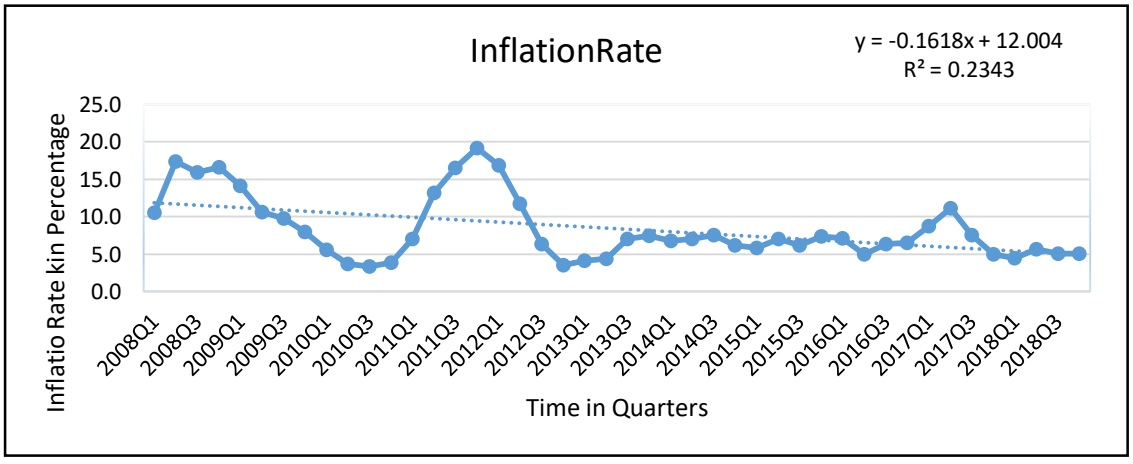
**Figure 3: Unemployment**




## Quarterly Trend Analysis of Inflation

The outcomes in Figure 4 shows the trade analysis of quarterly Inflation rate between the year 2008 and 2018 for Kenya. The trend line shows that the Inflation rate for Kenya has been oscillating with a reducing trend. In 2008, the inflation rate was recorded at 10.5% in the first quarter, and rose to 17.4% in the subsequent quarter. In 2009, the inflation rate had expanded recorded at 14.1% in the first quarter however it dropped to 8% in the last quarter of the same year. In 2010, inflation of the first quarter had increased to 5.5% from 14.1% the previous year, but in the second quarter the inflation rate had rapidly decreased to 3.7%. However, the inflation rate drastically rose to 13.2% in the second quarter of 2011, by 9.5% from the one in the same quarter in 2010. In 2012, the inflation rate was at 3.5% in the fourth quarter a drastic drop from 19.2% in the fourth quarter of year 2011. In 2014, the inflation rate was recorded to be 7.4% in the fourth quarter and 5.0% in the second quarter. By 2017, the inflation rate of the second quarter had inclined to 11.2% in 2017. However, at the start of 2018, in the first quarter the inflation rate was at 4.5% an improvement from the previous rate of 8.8% in the same quarter 2017.

**Figure 4: Inflation Rate Trend**



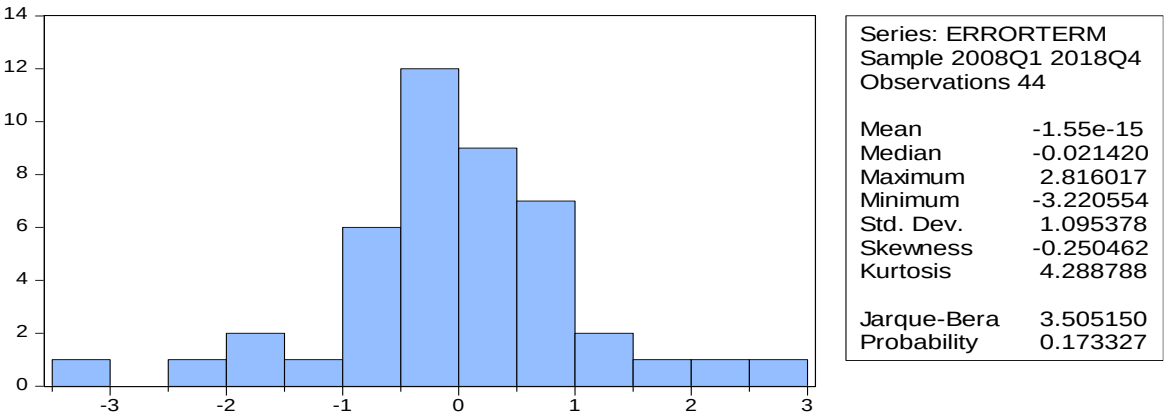
## 4 Diagnostic Tests

Various diagnostic tests were conducted to avoid generating spurious regression results and they include the normality tests, heteroskedaticity tests, multicollinearity tests and stationary tests.

### Normality Test

Jarque-Bera test was used to test the normality of the error term/residual. The figure 5 shows that the error term was normally distributed. This implied that the data was fit for a parametric analysis like regression analysis. This was supported by Jarque-Bera statistic of 3.505150 and a significance of 0.17332.

**Figure 4.7: Normality of the Error Term**




### Heteroscedasticity

Among the assumptions of Ordinary least squares (OLS) is that the error terms or the residuals should have a constant variance, that is, they must be homoscedastic. Therefore, in this study heteroscedasticity test was used to test whether the error term was constant across all the observations. The study used the null hypothesis that stated that the data is not heteroskedastic. According to the outcomes in Table 2, the null hypothesis was not rejected, implying that the data was homoscedastic. This was supported by the F-statistic, 1.509345 and the p- value of 0.1704.

**Table 2: Test for Heteroscedasticity**

| | | | |
|---|---|---|---|
| **F-statistic** | 1.509345 | Prob. F(20,23) | 0.1704 |
| **Obs*R-squared** | 24.97276 | Prob. Chi-Square(20) | 0.2025 |
| **Scaled explained SS** | 30.6291 | Prob. Chi-Square(20) | 0.0603 |

### Auto Correlation

In this satisfy Breusch-Godfrey Serial Correlation LM Test was used to check for the correlation of the error terms across the time periods. Table 3 shows the summary of results.

**Table 3: Breusch-Godfrey Serial Correlation LM Test**

| | | | |
|---|---|---|---|
| F-statistic | 0.752075 | Prob. F(4,34) | 0.5636 |
| Obs*R-squared | 3.576635 | Prob. Chi-Square(4) | 0.4663 |

The null hypothesis was that no first category auto correlation exists. According to Table 4.3, the p- value was, the results conveyed the p-value to be 0.5636 which is greater than the critical value, 0.05 implying the rejection of the stated null hypothesis. This means that there was autocorrelation, and in order to correct for the auto correlation the variables under study were lagged.

**Test of Multicollinearity**

Multicollinearity is the presence of correlations in between the independent variables (William, Burke, Beckman, Morgan, Daly & Litz, 2013). With multicollinearity the residual/ standard errors expand which leads to unstable estimates of coefficients of predictor variables. Multicollinearlity was identified, between the rate of currency exchange between Kenyan shilling and US dollar & Chinese Yuan, unemployment and rate of interest spread. The presence of multicollinearity was eliminated through use of white heteroscedasticity test to produce robust standard error.

**Table 4: Multicollinearity**

| | GDP Growth | Inflation Rate | Spread | Unemployment | EUSD | E Chinese Yuan |
|---|---|---|---|---|---|---|
| GDP Growth | 1 | | | | | |
| Inflation Rate | -0.57446 | 1 | | | | |
| Spread | -0.14674 | 0.238034 | 1 | | | |
| Unemployment | 0.482712 | -0.36946 | 0.51055 | 1 | | |
| EUSD | 0.570763 | -0.3515 | -0.51936 | 0.13708 | 1 | |
| E Chinese Yuan | 0.624052 | -0.37062 | -0.34156 | 0.290009 | 0.950163 | 1 |

**Test of Unit Root**

This test helped this study to check if the variables were stationary. Augmented Dickey-Fuller (ADF) test was used to test for stationarity. The results of Table 5, are obtained after conducting the test.

**Table 5: Unit Root Test**

| Variable name | ADF test | 1% Level | 5% Level | 10% Level | Comment |
|---|---|---|---|---|---|
| GDP Growth | -5.14 | -4.19 | -3.52 | -3.19 | Stationary |
| Inflation | -4.47 | -4.19 | -3.52 | -3.19 | Stationary |
| Spread | -1.52 | -4.19 | -3.52 | -3.12 | Not Stationary |
| Unemployment | -2.61 | -3.59 | -2.93 | -2.6 | Not Stationary |
| E Chinese Yuan | -3.75 | -4.19 | -3.52 | -3.19 | Not Stationary |
| EUSD | -4.5 | -4.19 | -3.52 | -3.19 | Stationary |

GDP growth, rate of inflation and rate of currency exchange between US dollar and Kenyan shilling were found to be stationary at 1%, 5% and 10% levels of significance. However, as per the results in Table 4.4 unemployment, Exchange rate between Chines Yuan and Kenyan shilling and Interest rate spread were not stationary at levels 1%, 5% and 10% of significance. As a result, first difference was conducted on the non-stationary variables because without them being stationary then the study would not make inference on the turbulent data.

After the conduction of unit root first differencing only the variables unemployment, interest rate spread and Chinese Yuan exchange rate with Kenya shilling then all were found to be stationary. The Table 6 showed the outcomes of the first differencing.

**Table 6: Unit root tests After Differencing**

| Variable name | ADF test | 1% Level | 5% Level | 10% Level | Comment |
|---|---|---|---|---|---|
| Spread | -5.69771 | -4.19234 | -3.52079 | -3.19128 | Stationary |
| Unemployment | -6.35816 | -3.59662 | -2.93316 | -2.60487 | Stationary |
| EChineseYuan | -6.10223 | -4.1985 | -3.52362 | -3.1929 | Stationary |

**Regression Analysis**

The researcher regressed the dependent variable GDP growth against each independent macroeconomic variable. This shows a long run relationship.

**Interest Rate Spread and Economic Growth**

The outcomes were indicated in table 7 and conveyed that the spread of interest rate and the growth of economy are negatively but insignificantly related (β= -0.1211, p=0.3419). This implied that a unit increase in spread of the interest's rate led to a decrease in the economic growth by 12.11%. However, the change caused by Interest spread rate on the growth of the economy is insignificant, implying that in the long run interest rate spread does cannot be used to predict GDP. The results were consistent with that of Irungu (2013) whose study aimed at assessing the influence of interest spread on the monetary performance of Kenyan commercial banks. The study established a direct and significant interconnection between financial performances and interest rate spread.

**Table 7: Regression of Coefficient**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 5.926 | 1.20314 | 4.92546 | 0 |
| SPREAD | -0.1211 | 0.12601 | -0.9614 | 0.3419 |

**Unemployment and Economic Growth**

The investigation examined the effect of unemployment on growth of the economy. The summary results were shown in table 8.

**Table 8: Regression of Coefficient**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -26.648 | 8.80556 | -3.0263 | 0.0042 |
| UNEMPLOYMENT | -3.29756 | 0.92315 | -3.57206 | 0.0009 |

The outcomes in Table 8, indicates that unemployment and economic growth are negatively and significantly related, this was supported by (β= -3.29756, p=0.0009). This means that the change caused by unemployment on the growth of the economy in the long run is insignificant. The results were in tandem with those of Kalim (2013) who investigated the interconnection that exists between population and unemployment as well as the converse interconnection between unemployment and economic growth. From the outcomes of his study the two variables, economic and population growth were established to be key determinants of unemployment in the economy.

**Exchange Rate (United States Dollar/ Kenya Shilling) and Economic Growth**

According to the results in Table 9 showed that the exchange rate (United States Dollar/ Kenya Shilling) and economic growth are significantly and positively linked (β= 0.08656, p=0.0009). This implied that a unit increase in United States Dollar/ Kenya Shilling exchange rate led to rise of economy size by 8.65%.

**Table 9: Regression of Coefficient (EUSD)**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -2.908 | 1.72302 | -1.6877 | 0.0989 |
| EUSD | 0.08656 | 0.01921 | 4.50481 | 0.0001 |

The findings were similar to that of Kurtishi-Kastrati (2016) who looked at the influence of exchange rates on the Macedonian economic growth. Their study concluded that that exchange rates had a direct and remarkable positive impact on the Malaysian Economic growth. The argument supported the current regime, that is, the fix regime which supports the macroeconomic stability of Malaysia.

Further, the study examined the effect of Chinese Yuan exchange rates on the economic growth. Table 10 shows the summary results of regression.

**Table 10: Regression of Coefficient (E Chinese Yuan)**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -2.8738 | 1.49528 | -1.9219 | 0.0614 |
| ECHINESEYUAN | 0.56167 | 0.10852 | 5.17584 | 0 |

Similarly, the exchange rate between Chinese Yuan and Kenya shilling was regressed against economic growth. Results in Table 10 shown that exchange rate (between Chinese Yuan and Kenya shilling) and economic growth had a significant relationship and were positively related,

linked (β= 0.56167, p=0.000). Implying that a unit increase in the exchange rate between the Chinese Yuan and Kenya shilling would lead to an increase in economic growth by 56.17% in the long run.

The findings were similar to that of Kurtishi-Kastrati *et al*., (2016) who investigated the influence of exchange rates on the Macedonian economic growth. Their study concluded that that exchange rates had a direct and remarkable positive effect on the Malaysian Economic growth. The argument supported the current regime, that is, the fix regime which supports the macroeconomic stability of Malaysia.

**Inflation and Economic Growth**

Further investigation was done on the relationship between growth of the economy and inflation. The regression results were summarized in Table 11.

**Table 11: Regression of Coefficient (Inflation)**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 6.679138 | 0.464497 | 14.3793 | 0 |
| INFLATIONRATE | -0.22516 | 0.049504 | -4.54833 | 0 |

The linear association between inflation and growth of the economy was also sought. Table 4.16 depicts that inflation and growth of economy are have a negative linear association which is significant, (β= -0.22516, p=0.000). This shows that in the long run a unit increase in inflation causes 22.52% decrease in economic growth.

The results echoed those of Misati, Nyamongo and Mwangi (2013) who did a research on the linkages connecting product prices and both general inflation (non-food and non-fuel inflation). Analysis was done through the use structural vector autoregressive (SVAR) and Granger causality techniques. Food and oil prices were found to have a significant role in predicting inflation which had a negative relationship with rate of economy growth.

**Co-integration Tests**

These are tests that check for stability and long run associations between sets of variables that have unit root tests (Rao, 2007). This study utilized the Johansen test of co-integration to test the co-integration. According to the results in Table 12, there exist at most 1 co integration equation as supported by a trace statistic of 107.7224 at a p-value of 0.032. This implied that the variables in the model are co-integrated.

**Table 12: Johansen Co-Integration test**

| Hypothesized No. of CE(s) | Eigenvalue | Trace Statistic | 0.05 Critical Value | Prob.** |
|---|---|---|---|---|
| None * | 0.571039 | 107.7224 | 95.75366 | 0.0058 |
| At most 1 * | 0.493334 | 72.17403 | 69.81889 | 0.032 |
| At most 2 | 0.440668 | 43.61811 | 47.85613 | 0.1182 |
| At most 3 | 0.269308 | 19.2156 | 29.79707 | 0.4775 |
| At most 4 | 0.123765 | 6.037551 | 15.49471 | 0.6911 |
| At most 5 | 0.011563 | 0.488455 | 3.841466 | 0.4846 |

**Regression Results in Short Run**

Due to the outcomes of co-integration between the variables used in the model, an error-correction model linking both associations in short and long run was formed. The error correction term was formed by using the residuals from the co-integrating regression, that is, the lagged residuals. The results are presented in Table 13.

**Table 13: Short Run Regression**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| DIE_CHINESEYUAN | -0.314 | 0.339023 | -0.92618 | 0.3605 |
| DISPREAD | 0.035606 | 0.235363 | 0.151128 | 0.8806 |
| D1UNEMPLOYMENT | -4.21453 | 1.51292 | -2.78569 | 0.0085 |
| INFLATION | -0.17717 | 0.045017 | -3.93554 | 0.004 |
| EUSD | 0.062975 | 0.017987 | 3.501148 | 0.0013 |
| ERRORCORRECTERM | 0.146351 | 0.16878 | 0.867109 | 0.3916 |
| C | 0.726042 | 1.777028 | 0.410129 | 0.6841 |
| R-Squared | 0.5614 | Mean dependent Var | 4.88814 | |
| Adjusted R-squared | 0.4883 | S.D dependent var | 1.603902 | |
| S.E of regression | 1.147323 | Akaike infor criterion | 3.547347 | |
| Log likelihood | -63.1038 | Hannan-Quinn Criterion | 3.366369 | |
| F-statistic | 7.679883 | Durbin-Watson Stat | 1.499407 | |
| Prob (F-statistic) | 0.000023 | | | |

The outcomes showed that the Exchange rate between Kenya and the Chinese Yuan was negatively and insignificantly related to economic growth in the short run, as shown by the regression coefficient of -0.314 and the p-value, 0.3605. The results also revealed that the Exchange rate between Kenya and the United States Dollar was positively and significantly related to Economic growth in the short run. This was supported by the regression coefficient of 0.062975 and the p-value of 0.0013. This indicated that one unit rise in the US – Kenya exchange rate led to an increase of the economic growth of Kenya by 0.062975 units.

Further, the spread of the interest rate had an insignificant but positive relationship with the growth of the economy in the short run as depicted by the regression coefficient of 0.035606 and a probability value of 0.8806. This implied that a unit rise of interest rate spread has no effect on

Economic growth in the short run. Further, unemployment had a positive but significant effect on the growth of the economy in the short run as indicated by the regression coefficient of 4.214527 and a probability value of 0.0085. It implied that a unit rise in unemployment rate caused a growth of the economy by 4.214527 units. Inflation was also had negative but significant effect on the growth of the economy in the short run as revealed by the regression coefficient of -0.17717 and a p-value of 0.0004. This implied that one unit rise in inflation led to a decrease in the economic growth by 0.17717 units

Model summary in Table 13 shows the output for model fitness and value of adjusted R squared to be 0.4883. This shows that the variables (Chinese Yuan, Interest rate spread, unemployment, inflation, exchange rates for US dollar, and error corrected term) tested explained 48.83% variation of the economic growth. This implies that other factors not studied in this research contribute 51.87% of changes in economic growth. Further research should therefore be conducted to investigate the other factors (51.87%) that affect economic growth.

Additionally, the ANOVA results depicted in Table 13 were used in establishing the significance of the model. The results reveal a p-value of 0.000023 which when compared to the critical value at 95% confident level, is less than 0.05 hence significant. In that regard, the F-ratio of 7.679883 is significant. This outcome therefore depicts that the independent variables combined have significant effect on the dependent variable. As such, the regression model was therefore significant.

## 5.0 CONCLUSION AND RECOMMENDATION

### 5.1 Conclusions

The study concluded that there was at most one integrating equation in the short run. Additionally, it also concluded that both in the long and short run inflation had significant negative effect on Economic growth. As such, a rise in inflation led to decrease in growth of economy. Likewise, the exchange rate for USD/ Kenya shilling was found to have a significant positive impact on growth of economy both on long and short run. Thus, a unit increase in the exchange rate increases the growth rate of the economy. As for unemployment, the study concluded that its effect was negative on growth of economy in both the long run and short run. The spread of interest rate however, has insignificant impact on growth of economy in both long and short run.

### 5.2 Recommendations

Given that the effect of exchange rate was positive on economic growth. The policy makers should set strategic measures that will guarantee stable trade rates in a way that it is going to improve the exports. Exports raises the foreign exchange rate of a country. Thus if this is achieved then the economic growth of Kenya will be boosted. Recently, the Central Bank of Kenya set a fixed interest rate for all banks in Kenya, as a way of reducing interest rate and in turn cushioning inflation. This study recommends that such fiscal policies should be upheld and the CBK should consider even reducing the interest rate further over time with an aim to reduce inflation and in turn boost the economic growth. On the basis that unemployment affects economic growth negatively, the government should consider creating more job opportunities, and also encourage investors to come in the country. Investors settling in the country can create job opportunities which means that the unemployment level will decrease and as a result increase the economic growth. According to the Keynesian theory of employment, unemployment is a function of

government spending and therefore this theory is useful in linking government spending, unemployment and economic growth for the study period.

The government should come up with effective macro-economic policies and ensure improvements in the structure and functioning systems of governance for stabilizing economic growth along with job creation. The government thus needs to create a conducive environment and flexible labor market policies or legislations that entice many private sector and small businesses which will in turn consolidate the existing entrepreneurship activity with new entrepreneurial entrants so as to create more employment and absorb a large pool of unemployed population.

Since the economic environment usually changes over time due to new political grounds and new policies. Future studies should be conducted to establish the relationship between macroeconomic factors and the economic growth using other theories such as Okun's law theories and other methodologies such as Autoregressive Distribution Lags. This will allow for comparison and establish whether these factors have the same influence on economic growth. Additionally, the future studies can be extended to include all the East African countries with an aim of establishing unified economic environment or optimal currency to ensure growth across the countries.

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