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Effect of Macroeconomic Variables on Balance Of Trade in Kenya

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Abstract
Changes in the international trade patterns in the era of globalization have caused the need for a clearer understanding and addressing of determinants of a country's balance of trade position. Over the years, Kenya has been experiencing deficits in the balance of trade. The widening deficit is piling pressure on the shilling against global currencies such as the dollar, denying Kenya an opportunity to create more jobs because locals lose out to foreign manufacturer. In addition, a wider deficit is watched closely by global investors, especially when Kenya seeks foreign debt, as it affects the recommended external debt service to exports ratio of 21 per cent, which Kenya has already breached. The current research sought to examine the effect of macroeconomic variables on balance of trade in Kenya. The study's specific objectives were to determine the influence of foreign exchange rate, interest rate, foreign direct investment and inflation on balance of trade in Kenya. Quantitative data was collected during the study and then it was coded into statistical package known as Stat Version 14 for statistical analysis. Inferential and descriptive statistics were used to analyze quantitative data. Descriptive statisticsentailed computation of mean, percentage and standard deviation. In addition, regression analysis was conducted after diagnostic tests. The study found foreign exchange rate has an inverse, but insignificant effect on the balance of trade in Kenya. In addition, interest rate has an inverse and significant effect on the balance of trade in Kenya. Further, foreign direct investment has positive and significant effect on the balance of trade in Kenya. Also, the study found that there is an inverse and significant relationship between inflation and balance of trade in Kenya. The study recommends that policy makers including the central bank of Kenya should review policies on interest rates and ensure the lowest possible interest rates are charged so as to support expansion of businesses and hence subsequently increase exportation of goods to other countries. The government of Kenya should improve conditions that can make the Kenyan market more attractive to invest in so as to increase exports to other countries. These strategies should include the use of tax subsidy and tax relief and tax holiday. Also, the government of Kenya should come up with policies to curb inflation rate. The government of Kenya through the Central bank should seek to develop or improve monetary and fiscal policies so as to ensure the stability of the exchange rate.

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I. Introduction

1.1 Background of the Study

In the last three decades, economies have increasingly been opening up through global trade due to economic factors associated with globalization among other factors. Global trade facilitates economic performance as well as social performance mostly in developing countries (Shawa & Shen, 2016). The extent to which global trade ensures development is determined by the objective of service and context of work. A lot of studies have empirically established the advantages of global trade by use of various channels, these includes h influence of trade on economic growth or economic development, influence of global trade on poverty and influence of global trade on inflation (Mwega, 2018). Nevertheless, the usefulness of information about trade balance depends on the country. The greater the effect is generally seen in countries having limited forex reserves, where the release of trade data can have a greater influence in their currencies. Current account has trade data as its largest component; this makes market professional and investors to keep in touch with the trade data since it is a key indicator for the economy state (Sharif, Yassin & Sheikh, 2016). Deficits in the current account in terms of GDP percentage is particularly monitored for indication of management failure furthermore currency devaluation may also be as a result of deficit. Nevertheless, a short term deficit may be seen as acceptable for it is an indication of a fast and strongly growing economy hence the need of imports to facilitate the growth (Toroinch, 2017).

Currently as many developed nations used to, the countries facing industrialization recently are taking the advantage of global trade to ensure improved growth and development of their economy within a very short period of time, most of the developing nations, on the other hand, have dwelt on the unilateral and multilateral removal of trade barriers which yields less economic growth and development (Zewudie, 2016) the global trade

benefits to different countries can be established through the countries' trade balance, which can either be in deficit or surplus. Cergibozan (2017) indicates that, theoretically, trade surplus is seen as good and affects a countries economy in a positive way since the excess exports increases the foreign money inflow from other countries to the local economy. The economic national income increases together with some specific indicators such as tax revenue, savings consumption and investment which are viewed as "favorable" for every economy. A certain level of both growth and development is experienced by countries with constant surplus. For example, according to Duasa (2016), developed countries such as Canada, Japan and Germany enjoy sustainable economy which grown and developed as a result of trade surpluses.

On the other side, trade deficit is seen as harmful to an economy as it is taken as a drawback to any nation for it ensures foreign reliance at the expense of local production and employment creation (Alhanom, 2016). Deficit indicates current consumption at the expense of future growth. This is so because the country's purchases exceed production hence implicating future investment is consumed currently. The economy can be influenced negatively by large deficits as they create good surrounding for financial crisis. Akoto (2019) indicates that it is essential to know that deficits are detrimental to an economy. They indicated that, the level of growth and employment can be negatively affected by trade deficits. Erandi and Tissa (2019) revealed that, the investment activities in a country are lowered by high volatility of deficits which results to insecurities concerned with the profitability of these securities in the long run.

Some industrialized nations like USA, Greece, Portugal, Spain, United Kingdom and Australia indicate larger and consistent deficits (Kennedy, 2019). Countries from eastern and central Europe reveal large trade deficit. On the other hand, some countries from Western Europe like Germany, Austria, Finland, Netherlands, Switzerland, Sweden and Ireland have attained large trade surpluses determined as a fraction of gross domestic product. In India, since the independence in 1947, the balance of trade in India was on deficit except two fiscal years, 1972-73 and 1976-77. Recently, in two fiscal years, 2002-2003 to 2008-2009 the balance of trade has been experiencing deficits (Dang, 2017). In 2011 Ghana attained a trade deficit of US$3,183 million compared to that recorded in 2010 which amounted to USD 2,647.9 million. This increase was as a result of high imports as compared to export value (Turkson, 2019).

Trade, as a percent of the GDP, has been increasing in some of the East African region countries and decreasing in others. As shown in Table 1.1, Kenya had the highest trade as a percent of the GDP in the year 2006 (55.24%), followed by Burundi (54.15%), Uganda (43.63%), Tanzania (42.11%) and Rwanda (37.10%). However, in the year 2016, Rwanda had the highest trade as a percent of the GDP (48.03%), followed by Uganda (47.22%), Tanzania (42.33%), Burundi (38.16%) and Kenya (36.75%), implying that while trade may be increasing in other countries in the East African region, it has been decreasing in Kenya.

Table 1. 1: Trade (% of GDP) in East Africa Community

Country Name	Burundi	Kenya	Rwanda	Tanzania	Uganda
2006	54.15	55.24	37.10	42.11	43.63
2007	41.48	53.89	40.88	50.60	46.78
2008	47.42	57.58	42.38	49.44	56.26
2009	49.93	50.86	41.41	43.65	46.74
2010	48.10	54.23	42.03	47.88	45.72
2011	47.02	60.45	43.89	56.80	52.94
2012	46.42	57.85	44.57	54.40	53.34
2013	41.64	53.13	46.02	48.72	50.90
2014	41.31	51.30	47.63	49.20	46.32
2015	35.99	44.21	52.55	46.40	47.66
2016	38.16	36.75	48.03	42.33	47.22

Source: UNCTAD (2017)

In the last two decades, trade imbalances for East African countries have been increasing and the pattern shows a continuation of the phenomenon. Burundi has the largest imbalance followed by Rwanda and Kenya. Uganda and Tanzania have trade imbalances of less than 20 percent of the GDP (for details Figure 1.1). East African countries like many other sub-Saharan countries depend highly on agricultural commodity exports for their growth. As a result, they suffer when commodity prices drop. However, when commodities are expensive, they can account for a larger share of exports and imports. Chiu and Sun (2016) pointed out that, like most African economies that depend heavily on commodities' exports, Mozambique suffered from the price

drops, with the government being advised to find ways to diversify the economy to rekindle its momentum. Cergibozan (2017) answered on whether the poor economic growth and development of African nations was as a result of local export dependency. They pointed out that in relation to the manufactured goods prices the price reduced in less than half of the expected price; moreover, prices were highly variable and some nations assumed that exports determined the gross domestic product.

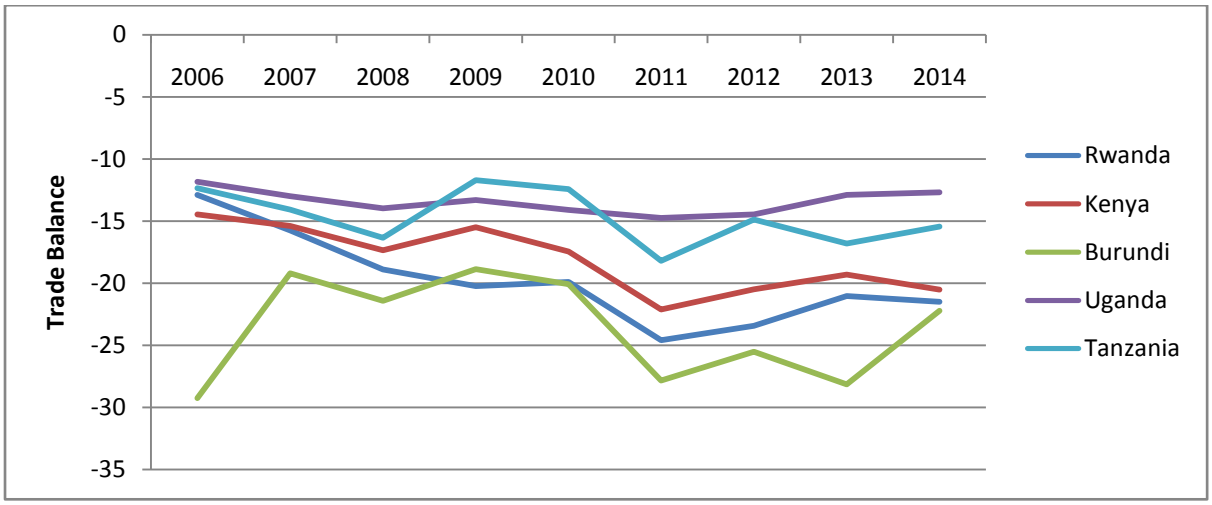

Figure 1. 1: Trade Balance in East Africa Community

Source: UNCTAD (2017)

Latest data released by the government indicates Kenyan economy dropped from a surplus of KSh 8.8billion in the first three months of 2014 to a trade deficit of KSh 14.3 billion in the first three months of 2015. The decline of current account balance of payment mostly comes with more imports and less exports (Central Bank of Kenya, 2017). In the first three months of 2015, merchandise trade deficit declined by 6.4 % to KSh224.1 billion from KSh 210.6 billion attained in the first three months of 2014. Imports raised by 3.0 % to KSh 355.7billion whereas exports declined by 2.3 per cent to KSh 131.5 billion in the quarter under review. As a result, the current account balance attained a trade deficit of KSh 101.5 billion in the first three months of 2015 in relation to a trade deficit of KSh 63.8 billion in the first three months of 2014.

In 2016, Kenya was the ranked number one hundred and seven in terms of global export economy. In 2016, Kenya managed to export $4.7B as well as importing $15.8B; this reflected a trade deficit of $11.1B. In 2016 the Kenya's GDP read $70.5B, the GDP per capita read $3.16k. Kenya's major exports are Tea ($1.09B), Cut Flowers ($673M), Coffee ($219M), Legumes ($139M) and Titanium Ore ($106M), using the 1992 revision of the HS (Harmonized System) classification. Its major imports include Refined Petroleum ($1.28B), Packaged Medicaments ($495M), Cars ($442M), Delivery Trucks ($278M) and Telephones ($271M) (Central Bank of Kenya, 2017).

1.1.1 Macroeconomic variables and balance of trade.

There are various views on how macroeconomic factors influence the balance of trade in a country within a certain period of time. Theories of exchange rate have it that, depreciation of exchange rate increases the amount of exports while at the same time reducing the imports. In the country, the theory differs with the empirical data as the amount of trade balance continues to worsen with a depreciation of the exchange rate (Kennedy, 2019).

FDI as a foreign capital has been known to increase the amount of domestic capital available for investment purpose (Erandi & Tissa, 2019). This is supposed to increase the amount of goods and services produced in a country. This is expected to reduce the balance of trade deficit which has not been the case in the country.

On the other hand, inflation refers to a general rise in the price level in a country. This raises the cost of doing business a factor that also discourages investment. This is supposed to increase imports as goods cannot be produced in the country due to high costs (Dang, 2017). In the country, there has been stability in the rate of inflation for the last few years. This observation should encourage both domestic and foreign investment in the country. The end result is an increase in the productive capacity of the country. Although the country has experienced relatively low rates of inflation, little can be said about improvement in the balance of trade (Akoto, 2019).

There are contradicting views on how the rate of interest affects various macroeconomic variables such as investment and the exports. Classical economists for example maintain that, the principal determinant of investment in any country is the cost of borrowing which in our case is the rate of interest. Alhanom (2016) for example observed that, a lower interest rate encourages business firms to borrow money for investment purpose. This increases the locally produced goods and services in the economy. Some of the commodities are exported while others are consumed within.A lower interest rate encourages investments a factor that encourages exports. This being the case, most countries especially in the developing countries have been trying to maintain low and stable rates of interest with the aim of encouraging investments.

Kenya in particular passed a bill in parliament that has since been signed into law of maintaining a rate of interest of not more than 4 % of the central bank rate (Central Bank of Kenya, 2017). This development is expected to encourage more investments in the country a factor that would encourage more exports from the country. Put it differently, more production can also reduce the amount of goods and services imported outside the country. The end result is a favorable balance of payment.

Although Kenya adopted a policy on interest rate capping so as to control the cost of borrowing, the policy may not have yielded the expected results as the amount of goods exported remains low, a factor that has affected the country's balance of trade (Erandi & Tissa, 2019).If good policies are to be formulated with regard to maintaining a favorable balance of trade, it is important to relook at the issue to see whether or not there is a link between the two variables as postulated by economic theory.

1.2 Statement of the Problem

Changes occurring in the global trade patterns in the time of removing trade barriers have caused the need for a better knowledge and addressing of trade balance determinants of a country (Shawa & Shen, 2016). Information about imports and exports is revealed by trade balance data, it also shows the competitiveness of a country in the international market. Balance of trade can either indicate a surplus or a deficit.in case of a deficit it show that a country imports more than it exports while trades surplus shows more exports as compared to imports (Shawa & Shen, 2016). The Kenya National Trade Policy acknowledges the importance of foreign trade in the realization of the Kenya Vision 2030 by facilitating an efficient domestic market and competitive export led economy. In an effort to ensure that there is trade balance in Kenya the government has adopted measures such as duty/VAT remission, Export Promotion Programme, Export Processing Zones (EPZ), Manufacturing Under Bond (MUR), establishment of Export Promotion Council (EPC) and even participation in international trade arrangements (Mengo, 2017).

Various studies have been conducted to reveal the impact of various macroeconomic variables on the balance of trade performance in a country. The main factors that have been considered include the exchange rate, inflation and the rate of interest (Toroinch 2017; Mwega, 2018). The findings by different studies however have not been unanimous and the findings change when different regions are considered.

Taking an example of Kenya, and how the identified macroeconomic factors have affected the balance of trade components, it can be seen that, imports in the country have been increasing, exports have been decreasing or remained constant. At the same time foreign exchange rate has been increasing while inflation and foreign direct investments have been fluctuating.The rate of interest has remained low since the capping a factor that was expected to raise the exports and reduce the amount of imports. These macroeconomic variables have not had the intended effect because, in January 2017, Kenya's trade deficit for the first time crossed the Sh1 trillion mark. The deficit — the gap between imports and exports — widened to Sh 1.034 trillion in the 11 months to November, up from Sh 778.04 billion in the same period in 2016 (Central Bank of Kenya, 2017). Imports increased by 20.93 per cent to Sh 1.58 trillion in the period to November 2017 while exports rose by 3.37 per cent to Sh 549.18 billion (Kenya National Bureau of Statistics, 2017). Over the years, foreign exchange rate in Kenya has been increasing reaching a figure of 104 shillings against the dollar in 2017. This depreciation of exchange rate is supposed to expand exports and contract imports which was not the case in the country. In addition, inflation in Kenya has been fluctuating over the years. In the year 2013, it was at 5.7%, increased to 6.9% in 2014, decreased to 6.6% in 2015 and 6.3% in 2016. In the year 2017, inflation increased to 8%. FDIs in Kenya have been fluctuating over the years. In the end of 2010, Kenya attracted only 12.9 percent of FDI in the EAC region while Tanzania and Uganda attracted 30.1 percent and 56.9 percent respectively. In the year 2012, Uganda's FDI increased by 92.51% to $1.721 billion from $894 million in the year 2011, while Tanzania attracted $1.706 billion in 2012, a 38.81% increase from $1.229 billion in 2011. Meanwhile, Kenya's FDIs went down by 27.04 % to $259 million from $355 million (UNCTAD, 2017). Before interest rate capping in the august of 2018, the weighted average rates of the commercial banks had been varying irregularly from 2007 reading a value of 20.53% in the third month of 2012. Prior to reducing the rate of interest to 13% in September 2016, they were reading 18% in August 2016. This development of maintaining low interest rate is expected to lower the cost of borrowing a factor that increases investment. It also raises production and therefore the amount

of goods and services exported. In addition, foreign exchange rate increased by 2.82 from 98.69 between 2015 and 2016. In 2017 there was further increase by 1.88 (NSE, 2017).

The widening deficit is piling pressure on the shilling against global currencies such as the dollar, denying Kenya an opportunity to create more jobs because locals lose out to foreign manufacturers (Mengo, 2017). In addition, a wider deficit is watched closely by global investors, especially when Kenya seeks foreign debt, as it affects the recommended external debt service to exports ratio of 21 per cent, which Kenya has already breached (Kenya National Bureau of Statistics, 2017). Therefore, it is important to determine the influence of macroeconomic variables on the balance of trade in Kenya so as to guide policy formulation to improve the trade balance.

Various studies have been done in Kenya on the determinants of the balance of trade. For instance, Mwega (2018) carried out a study with a purpose of establishing the determinants of trade balance in Kenya (2012-2014); and Toroinch (2017) conducted a study on the determinants of the trade balance in Kenya (1970-2010). However, these studies showed mixed findings. While Toroitich (2017) found that real exchange rate, inflation, government consumption expenditure was negatively related to balance of trade, Mwega (2018) found that they had no significant effect. Although the two studies that have been mentioned in this case did not consider the effect of the rate of interest, it is an important variable identified by economic theory. This development could be the cause of contradicting results due to the error of omitted variables in the model specification. For this reason, the current study goes further to find out how all the identified macroeconomic variables affect balance of trade as empirical data indicate different type of relationship. It is on this background that the current study focused on the following objectives.

1.3 Objectives of the Study

1.3.1 General Objective

The general objective of the study was to examine the effect of macroeconomic variables on balance of trade in Kenya.

1.3.2 Specific Objectives

The specific objectives of the study were;

i. To determine the effect of foreign exchange rate on balance of trade in Kenya
ii. To assess the effect of inflation on balance of trade in Kenya
iii. To examine the effect of interest rate on balance of trade in Kenya
iv. To establish how foreign direct investment affects balance of trade in Kenya

1.4 Study Hypotheses

$H_0$1 Foreign exchange rate has no significant effect on balance of trade in Kenya
$H_0$2 Interest rate has no significant effect on balance of trade in Kenya
$H_0$3 Inflation has no significant effect on balance of trade in Kenya
$H_0$4 Foreign direct investment has no significant effect on balance of trade in Kenya

1.5 Significance of the Study

The current account balance of every country has trade balance as the key component, this indicates that trade balance can have a greater impact on economic growth and development as well as balance of payment. Therefore, to the government of Kenya and policy makers the study provides information on the relationship between foreign rate of exchange, rate of interest, foreign direct investment, inflation and balance of trade, which can be used to formulate policies geared towards achieving a balance of trade in the country. Determining the reasons for these continuous trade imbalances is very essential since the country cannot permanently be recording trade deficits. In addition, the study on the determinants of trade imbalances identifies the nature and the cause of these imbalances and recommends the necessary policies to be implemented.

In addition, information on trade balance of the economy is very important to organizations like, the World Bank, Central bank of Kenya, IMF and Ministry of Finance. Therefore, to these organizations, the study provides information that can used to develop policies to guide trade between countries, liberalization of trade and external debts. In addition, economic trade contributes heavily to the country's GDP; therefore information on trade balance drivers is essential for growth and development.

The study adds more information to the body of knowledge on the determinants of the balance of trade. To other researchers and academicians, the study provides information on the on the determinants of balance of trade that they can use as research material in other related studies. The study also forms a basis upon which further studies can be conducted on balance of trade in Kenya and in other developing countries.

To investors the study provides information on the determinants of balance of trade that can be used to guide decision making on where to invest. Having a favorable balance of trade avails foreign currencies which are essential for importing goods and services as well as capital which cannot be produced locally.

1.6 Scope of the Study

Balance of trade is wide and detailed concept, therefore there might be need for several determinants in terms of macroeconomic variables that could have an impact on the trade balance in anyway but only the major determinants were considered by the study and these include: interest rate, foreign exchange rate, foreign direct investment and inflation. The study was conducted in Kenya and used an explanatory research design. Data, which was collected by use of a data extraction tool, covered a period of 48 years, starting from 1971 to 2018. This period was selected due to availability of data. In addition, the number of years has to be more than 30 (large sample size) for inferential statistics to be run. Data analysis was done by use of descriptive and inferential statistics with the help of statistical software known as STATA.

II. LITERATURE REVIEW

2.1 Introduction

This chapter entails presentation of theoretical and literature review on the effect of foreign exchange rate, foreign direct investment and inflation on balance of trade in Kenya. It also presents theoretical and literature review regarding the influence of foreign exchange rate, foreign direct investment, inflation as well as economic growth on the balance of trade. The section commences with theoretical review followed by empirical review, conceptual framework and research gaps.

2.2 Theoretical Perspectives

This section presents theories which relate to foreign exchange rate, foreign direct investment, inflation and balance of trade. In addition, the section presents theories which are related to the influence of foreign exchange rate, foreign direct investment, inflation and economic growth on the balance of trade. The theories which are used in this study include: Interest Rate Parity, Purchasing Power Parity Theory, The Neoclassical Theory of Investment and International Fisher Effect.

2.2.1 Interest Rate Parity (IRP)

Interest Rate Parity (IRP) theory was developed by Frenkel Jacob and Levich Richard in 1981. According to this theory the difference between the rates of interest of two countries is the same as the difference attained through use of forward rate of exchange as well as the spot rate of exchange techniques. Interest rate parity links interest rates, spot exchange rates, and foreign exchange rates (Cosandier & Lang, 1981).

IRP theory is very useful in determining the influence of the spot price on a relevant future rate of currencies. As per the theory, there will be no quick buying and selling of currencies in order to make profit in the interest rate difference occurring between two different currencies and the difference will be shown in the discount or premium for the future foreign exchange rate (Eaton & Turnovsky, 1983).In addition the theory emphasizes on the fact thatthe size of the future premium or discount on a foreign currency is the same as the difference between the spot interest rate and future interest rate of the countries being compared.

If IRP theory remains valid, then arbitrage possibility will be negated by the theory. This indicates that return on investment to investors will remain the same regardless of domestic or foreign currency investment. When foreign interest rate is higher than local interest rates, the foreign currency must trade at a future discount. This is applied with an aim of ensuring no arbitrage in the foreign currency. In case there is lack of future discount in the foreign currency or the available future discount is unable to offset the advantage of rate of interest, then this means there arbitrage opportunity for the local investors. This means foreign investment can sometimes be of great advantage to local investors (Dang, 2017).

When foreign interest rate is lower than local interest rates, the foreign currency must trade at a future premium (Akoto, 2019). This is applied with an aim of ensuring no arbitrage in the local country. In case there is no future premium in the foreign currency or the available future premium is unable to nullify the local country advantage, then this means there is an arbitrage opportunity for foreign investors. This indicates that domestic market will yield profit to foreign investors (Chortareas, Kapetanios & Magkonis, 2018).

IRP theory is related to this study as it is the fundamental equation that governs the relationship between interest rate, foreign exchange rates and balance of trade. This theory makes an assumption that if the interest rates in the 2 currencies vary, the variance will result to a discount or premium for the rate of exchange so as to overcome arbitrage opportunities. This in turn influences import export ratios between countries.

2.2.2 Purchasing Power Parity Theory

The PPP theory by Gustav Cassel in 1918 states that similar goods in different countries have same prices when measured using same currency in very same countries (Holmes, 1967). The assumption of this theory is that the actions of those who are importing and those who are exporting are motivated by the differences in prices and induce the spot exchange rates. In addition due to homogeneous nature of the trade commodities, the theory makes an assumption that there is lack of trade barrier as well as transactional costs (Amacher &Hodgson, 1974). Nevertheless, determination of purchasing power parity by use of price indexes limits this theory. This is because different countries determine their price levels by use of different goods (Alhanom, 2016). The theory 'proposition to the study is that the foreign market transactions have a great impact on the values of exchange rate. This shows that equilibrium will only be attained when the purchasing powers are in equilibrium (Altayligil& Çetrez, 2020). The theory makes the suggestion that the use of price indexes in determining the exact price of a similar product between countries.

2.2.3 The Neoclassical Theory of Investment

Jorgensen and James (1969) argue that the incentive packages are directly proportional to the flows of future investment; this has an impact on the rate of return expected, the investments' security, the scope and speed of reinvestment by organizations. The tax regime; investments guidelines; and macroeconomic policies at large are all factors influencing FDI. As per neoclassical theory, the income growth is impacted by FDI through raising the capital per individual. By use of research and development (R&D) as well as human capital variables the theory catalyzes long run growth.

According to Jorgenson (1971) MNCs can be able to facilitate variety of intermediate product development, facilitate global corporations on R&D, increase product quality as well as introduction of new methods of human capital through transferring of technology to their associates as well as ensuring technology spillovers to unaffiliated organizations operating from same host economy Ohlin (1967) gave detailed information of detailed of global production on the basis of neoclassical theories of trade and capital movement within the Hecksher-Ohlin framework. Nevertheless, these theories were criticized by Jorgenson (1971) on the account that they were developed on the assumption of good market and perfect factor existence hence unable to explain the nature of FDI and its pattern in a satisfactory manner. According to these theories FDI investment would not take place in case there is lack of market imperfections. However, as per the theories, availability of risk in foreign investment indicates presence of prominent importance of locating in a certain host country (Kyomukama, 2018).

2.2.4 Classical and interest parity condition to Interest rate

The various theories of interest rates focus on how fluctuations in the rate of interest can affect the amount of investment in a country. Going by the interest rate parity condition, it is expected that, capital will flow from countries experiencing low rate of interest to countries with high rate of interest (Kyomukama, 2018). The assumption in this case is that, people and business firms are profit maximizers and therefore will move their capital from lower returns regions to higher return regions.This argument is likely to break down when we consider the other definition of interest rate, that, it is the cost of borrowing capital. This being the case, it would mean that, businesses will relocate from regions of high interest rate to regions of lower interest rate. This is because, it will be lower to borrow and invest in regions experiencing lower cost of capital.

Going by the classical economist's argument that, interest rate is inversely proportional to investment, it is expected that, regions experiencing lower rates of interest are likely to register an increase in investment. More investment would mean more production of goods and services, more export and therefore an increase in the national income (Bakari& Mabrouki, 2016).

The classical argument on the influence of the rate of interest on the amount of investment made contradicts the hypothesis made by the interest parity condition. For the classical theory to hold, it is therefore assumed that, the commercial banks will not have a problem in creating money required to lend out. Or put it differently, the commercial banks can still create sufficient money to lend out despite low savings by the depositors.

2.2.5 International Fisher Effect

The International Fisher Effect of macro -economic variables was introduced and developed by Irving Fisher in the 1930s who was an economist. According to Fisher, countries have different inflation rates and this causes a similar variation in economic development as well returns. The theory hold that relative high interest rates in foreign currencies tend to depreciate in value due to the expected inflation brought about by the high nominal interest rates (Chiu & Sun, 2016).

Despite the theory having limitations in predicting the short run variations in exchange rates, it helps in understanding the exact interrelation between inflation, and the real as well as the nominal interest rates. The

theory helps in understanding why exactly inflation may have insignificant impact on the real interest in the long term (Chortareas, Kapetanios & Magkonis, 2018).

The proposition is that the changes in exchange rates experienced in countries will also tend to rule out any differences that may be obtained as a result of having varying interest rates. This theory is directly related to this study since it avails information on the purchasing power of each currency which incorporates the inflation of many countries with an aim of ensuring the purchasing power of one unit of currency in a country at equilibrium is the same as that of the other country (Chowdhury *et al.,*2018).

2.2.5 Marshall-Lenerner Condition Theory

Marshall-Lenerner Condition Theory was developed by Alfred Marshall in 1920s. The theory state that the condition at which the depreciation of exchange rate will result to an improvement if the total summation of long term export and long term import demand elasticity is greater than unity (Türkay,2019).

The MLR condition theory centers on the balance of payment elasticity approach. The theory aims to answer: 'when does real currency devaluation make an improvement a country's current account. The MLR condition indicates that when the summation of exports and imports demand elasticity is greater than 1 considering real exchange rate then the trade balance will be improved by the real devaluation of the currency. Suppose that the balance of trade is expressed in domestic currency. On one end, if there is zero demand elasticity for imports, then the value of domestic imports will rise and for the trade balance to improve, there must be a rise in the in domestic currency value by a percentage which is higher than the full real devaluation (, Harvey & Hegerty, 2016).

On the other hand, if there is a zero elasticity demand of imports for exports, Then following a real devaluation, the export' currency domestic value will remain the same. In order for the balance of trade to show improvement, the import value in domestic currency has to go down and this is the case when the demand elasticity for imports is greater than 1. On the other hand when the real currency value is declining and the demand elasticity is below 1, but the summation is greater than one, then the rise in exports will be more than offset by the rising in exports both valued in domestic currency thusly improving the balance of trade (Duasa, 2016).

2.2.6 Eclectic Paradigm of Dunning

Dunning (1980) came up with the paradigm of global production by incorporating imperfections in the structural market, imperfections in the transaction cost market and the location theory. The theory considers the nature of a country's involvement in international relations by analyzing two types of involvement. The first involvement is concerned with economic activities taking place within the limits, and thus using national resources, but concerning goods and services directed to foreign market. The second involvement is concerned with transactions of national economic agents using resources transferred to various countries to produce goods and services for foreign market. Dunning (1980) argues that the first involvement falls within the conventional international trade theory. The second involvement falls within the domain of international production and FDI. He further argues that the two are part of the same process. He asserts that in terms of a country's involvement, one has to explain why and when foreign markets are sourced through FDI and international production rather than production and exports. This approach is an attempt to analyze why and where decisions in terms of ownership, locational and internalization advantages (known as OLI advantages) (Fetene & Soyoung, 2017).

The essence of electric approach is in considering those advantages altogether and in applying them to both international trade and production. Ownership advantages (0) are specific to a particular enterprise (such as technology, marketing and production skills). If this advantage is exploited optimally, a firm can overcome and can be compensated for additional costs of establishing production facilities abroad (Gardner & Kimbrough, 2017). This advantage also gives the firm the ability for additional costs of establishing production facilities abroad. Locational advantages (L) are specific to countries likely to attract foreign investors. Under these factors such as large markets, government policies, the country's trade policy and tax incentives are included. Finally the firm gets greater benefits by exploiting both ownership and locational advantages by internalization (I). Firms do internalization due to the fact that markets for assets and product such as technology and knowledge are imperfect. The ownership and Internationalization are specific to a particular firm but the location advantages are specific to the host country and have a crucial influence on a host country's inflow of FDI. The advantages must occur jointly for FDI to occur (Hailu, 2016).

According to the electric paradigm by Dunning, organizations will prefer an integrated entry model when. These entry models include joint ventures or FDI versus licensing or export internalization location and ownership advantages are high (Khuram *et al.,* 2016). Dunning argues that, previously investments were targeting strategic assets, whereby FDI brought companies together with the aim of ensuring horizontal efficiency. On the other hand investments targeting both markets and resources aimed at ensuring vertical efficiency. The relevance of internalization advantages informs this research. The OLI paradigm has a wide

explanation of factors affecting FDI like tax incentives of FDI and their impact. This makes the model more important and relevant although some researchers criticize it.

This study considers OLI framework in hypothesizing the influence of FDI on balance of trade in Kenya. Each type of FDI reveals different influence of trade balance in the host country. On the other hand market investments show signs of causing trade deficits, factor-seeking FDI strategies reveals signs of causing trade surplus, this is because raw material seeking investment is used in manufacturing goods which are not available in the home country hence availing more exports to the host country as well as the other parts of the world including the home country. In addition, low cost production-seeking investment makes use of low cost factor as part of an overall international sourcing strategy hence managing to export goods and services to developing countries. In this instance, the host country is in a position to ensure increased exports and improved balance of trade.

2.3 Empirical Review Literature

2.3.1 Balance of Trade

Balance of trade is the difference between exports and imports (Cengiz, 2018). A trade surplus results when exports exceeds imports. On the other hand a trade deficit occurs when imports exceeds exports. The exports and imports used to determine a country's balance of trade comes by as a result of international trade.

Trade balance is a ratio used to compare both import and export prices and is concerned with both the balance of payment and the current account (Kiran, 2017). If exports of a country exceed the imports, the terms of trade improves, this is because export demand in the country goes up. However if the import prices exceed the export price the currency value will depreciate as compared to that of trade partners. Akoto (2016) states that increase in exchange rate decreases the balance of trade of a country while decreasing exchange rate lowers purchasing power of income and capital gains resulting from total returns. Investors need to understand the effects of exchange rates and currency value on their investments.

According to World Bank (2019), in its Economic Outlook on Kenya, the country has a current account deficit which means it does little exporting as compared to importing. Exporting and importing have a symbiotic relationship and are all pegged to the exchange rate of the shilling. In an explanation, the country suffers few exports because it produces goods with low prices which saturate the markets but do not fetch enough cash. Cheap exports can be attributed to the higher prices of the imported essential commodities which are required to produce quality and thus expensive goods for export (Mabior, 2019). Relatively cheap products are as a result of avoidance to use the imported items which would add quality to the goods and make them highly competitive in terms of price on the international market.

In 2005 Kenya's income from exports was estimated to be US$3.2 billion. The payment for imports estimated at US$5.7 billion. This yielded a trade deficit of about US$2.5 billion. Kenya's current account deficit increased substantially since 2008. However, the overall balance remained stable -despite it recovering from a deficit of 2 percent of GDP in the early 2009- due to strong services exports and a strengthening of the capital account. The government embarked on a programme of fiscal stimulus package so as to build a strong macroeconomic foundation (Maingi, 2018). The implementation of the program enabled Kenya's merchandise exports to rise as it had which been stagnant at around US$ 4 billion since 2006.

The last decade has seen several Europeans countries been overtaken by Kenya's trading partners in the EAC. Uganda has overtaken UK as Kenya's number one trading partner, Germany and France dropped while Somalia, Sudan and DRC are now Kenya's top ten exporting destinations plus the US. Kenya has increased its exports in the EAC region by taking advantage of trade preference to African countries by USA under the AGOA program. The Kenyan's exports have achieved a breakthrough in Asia which will soon became a base for future export growth beyond the confines of EAC and COMESA region (Kenya National Bureau of Statistics, 2017).

The fall in the Kenya shilling in 2011 to almost a quarter of its value has been said to have impacted on its trade deficit. The shilling fell in value from 82.00 shilling in January 2011 to 107 shilling in October 2011 against the dollar. The negative trade deficit further impacted on investor confidence. A waning investor confidence slows down growth, reduces the exports that a country can make and worsens the current account balance. The World Bank report states that Kenya should put in place constrains to restore the stability of the exchange rate in order to make the shilling valuable for imports which are a major factor in improvement of the exported commodities (World Bank, 2017).

2.3.2 Foreign Exchange Rate

In the state of Ghana, Senadza and Diaba (2017) determined the influence of foreign exchange rate volatility on trade in Africa. The study deployed pooled mean-group estimator. The target population included 11 Sub-Saharan African economies. Data frequency was annual, spanning 1993 to 2014, and is sourced from the World Bank's World Development Indicators. The study adopted a pooled mean group estimator of dynamic

heterogeneous panel technique to analyze data for 11 Sub-Saharan African economies (Gambia, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Nigeria, Sierra Leone, Tanzania, Uganda, and Zambia) from the year 1993 to 2014. The study found that there was no significant effect of foreign exchange rate volatility on imports. The study was limited to imports and hence did not focus on export.

In Turkey, Cengiz (2018) researched the relationship between foreign exchange rate, exports and imports. The study adopted VAR analysis and the methodology of the co-integration Panel Model. Findings revealed that changes in real exchange rate had insignificant effect on the foreign balance of trade hence disqualifying it in balancing of foreign trade. Moreover, the result revealed that import constraints had a negative effect on exports. The study was limited to Turkey and hence its findings cannot be generalized to Kenya due to differences in macroeconomic factors as well as import export ratio.

Puah *et al.* (2018) researched on the short run and long run impact of exchange rates changes towards trade balances for ASEAN-5 member countries, namely Indonesia, Malaysia, the Philippines, Singapore and Thailand. The study carried out both stationary and causality tests for sample collected from 1970-2004, findings revealed that despite the lack of long run relationship which is stable between both exchange rate and trade balances there was an impact of exchange rate on trade balance in all countries apart from Indonesia. This is a clear indication that the policy makers could use both discretionary monetary and fiscal policies to influence foreign trade performance. The study was limited to Asia, and hence its findings cannot be generalized to African countries like Kenya.

Agbola (2016) researched on the influence of exchange rate policy on exports performance in Ghana. The study used the Johansen Maximum Likelihood Estimators (MLE) multivariate cointegration for annual data from 1970 to 2002. The study made use of a single Stock-Watson Dynamic Ordinary Least Squares to estimate both the short run and long run coefficients of key variables influencing the trade balance. The variables in the model included nominal exchange rate, domestic interest rate, foreign interest rate, domestic and foreign money supply, domestic and foreign income. As per the results, depreciation of the exchange rate reduces the trade balance for Ghana in the short run. The study was limited to more than 15 years ago, and most microeconomic factors have changed since then and hence the findings cannot be used today.

In Japan, Ziwei (2018) researched on the influence of economic factors on bilateral trade between Japan and the USA. Vector auto regression estimation was deployed through use of quarterly data collected from 1980 to 2006. The study results revealed 3 long-run relationships from a list of 5 macro variables: foreign exchange, real rate of exchange, domestic income, trade balance and net foreign asset Short run variables are viewed as the coefficients of the error correction terms. The variance in balance of trade as a result of variation in the rate of exchange and the net foreign assets is established by Impulse Response Functions and Variance Decomposition procedures. Findings revealed that foreign rate of exchange was positively and significantly related to trade balance in the short term relationship, however, in the long term horizon, there was no stable relationship. Japan and United States are developed countries and hence their findings cannot be generalized to Kenya.

In Bangladesh, Chowdhury, Khanom, Emu, Uddin and Farhana (2018) researched on the influence of foreign rate of exchange on trade balance from the year 1973 to the 2011. The study adopted the use of ADF Unit Root Tests, Co-integration techniques, Engle-Granger test, and some other diagnostics test like Multicollinearity test, Normality test, Chaw test, Lagrange Multiplier serial Auto-correlation test and Rumsey's RESET model specification test. Findings revealed that foreign exchange rate was significantly and positively related to trade balance. Having been limited to Bangladesh, the results of this study cannot be generalized to Kenya.

In West Africa, Oluwatosin *et al* (2017) researched on the influence of foreign rate of exchange on trade balance in 4 West African Monetary Zone countries: namely The Gambia, Ghana, Nigeria and Sierra Leone. The study utilized panel data collected from 1980-2007, study findings revealed that cointegration existed between foreign rate of exchange and trade balance in all the states. The study was limited to countries in West Africa.

Fetene and Soyoung (2017) researched on the influence of real rate of exchange on the balance of trade in East African countries. ARDL methodology was used in 10 East African countries. The findings revealed that real rate of exchange was inversely proportional to the trade balance for 4 countries in individual country estimations, as well as in panel estimation and the elasticity of trade balance with respect to real exchange rate is inelastic. In addition, the study found that elasticity slightly increases after exchange rate liberalization but remains inelastic. Further, the findings indicated that significant short-run fall was not found for trade balance, which suggests lack of evidence for *J*-curve relationship.

In Kenya, Ogutu (2018) researched on the influence of foreign rate of exchange on trade balance. Quantitative research design was deployed. The research used time series data collected from 1963 to 2013. Findings revealed that foreign rate of exchange influence trade balance in a positive and significant way. This indicates that devaluation of the currency of Kenya leads to an improvement in the balance of trade.

Furthermore findings revealed that exchange rate regime did not have long run influence hence not being able to influence imports and exports. This calls for the government to keep of ensuring flexible rates of exchange but carry out mandatory intervention controls via the CBK to ensure currency stability.

2.3.3 Interest Rate

Shafi, Hua and Idrees (2019) researched on the influence of interest rates on BOP in both India and Pakistan. The study was comparative. Findings revealed that interest rate had a negative impact on BOP in both countries. Globally interest rates can have a combination of positive and negative impacts on global business markets. The rate of interest impacts the economy through influencing recessions, inflation, interest rates of stock and bonds as well as business expenditure

Gardner and Kimbrough (2017) researched o the influence of interest rate on balance of trade in global economy. A two-commodity inter-temporal framework is used to show that, in contrast to the conventional wisdom, both permanent and temporary tariffs in interest rates may worsen the trade balance of a large country. The results indicated that interest rate had a negative effect on trade balance in the world economy.

Sitima (2018) researched on the influence of interest rate on trade balance and employment in South Africa and its trading partners. The study focused on the exporting sector dealing with employment. The quarterly data used in this study ranges from 1977 to 2008. The VECM methodology was deployed for provision of both the long run and short run dynamic impacts on the trade balance movements. Findings revealed that interest rate had a statistically significant impact on the balance of trade. The VECM model found 3 cointegrating equations and the most interesting result that came from this analysis is the co-movements of real effective interest rates differentials among the 3 cointegrating equations.

Mabior (2019) examined the effect of interest rate on balance of payments performance in Kenya. The study used time-series data for the period between 1975 and 2012. The study adopted unrestricted VAR model which had lag four as the maximum lag to estimate the relationship between balance of payments in Kenya and previous balances in balance of payments account, and real interest rate. The study found that real interest rate has an inverse effect on balance of payments in Kenya.

2.3.4 Foreign Direct Investment

In Turkey, Kiran (2017) researched the influence of FDI on trade balance over the period from the year 1992 to 2008. Data was collected on quarterly basis. Stationarity was tested by use of minimum LM unit root while causality was tested by use of both Granger model and Dolado-Lüthkepohl model. .The test findings on the basis of bi-variate VAR model revealed absence of causality between FDI and trade in Turkey. As per the findings, it can be recommended that the Turkish economy should try as much as possible to improve some factors, such as skilled labor, political stability as well as developed financial systems, before having foreign investment.

In Vietnam, Thach et al. (2017) researched on the impacts of FDI and balance of trade on economic growth. Time-series data from the year 1990 to 2015 in Vietnam was used in the study; also the study deployed Vector Error Correction Model for analysis. The results showed that there was survival in the long-term relationship between FDI, trade and economic growth in Vietnam. In addition, a causal relationship existed between FDI and economic growth in Vietnam. At the same time, in the short term, FDI also impacts the economic growth of Vietnam.

In Spain, Solomon (2016) studied the relationship between FDI and economic growth of those host countries. GMM methods with panel data from 111 countries within and outside the OECD from 1981 to 2005 are used. The result states economic development, human resources and political environment in the host country impact on FDI inflows. At the same time, FDI level has significant influence on the economic growth of countries with low GDP per capita. Economic growth in a country influences its importation and exportation of goods.

Roman and Padureanu (2018) propose a model for the relationship between FDI and GDP based on empirical evidence from Romania during the transition period. The neoclassical model and production function Cobb - Douglas were used to analyze the impact of FDI on economic growth of this country. The results indicated that FDI has a positive impact on GDP and fiscal policies of Romania. FDI is as a key component to solve the problem of capital deficit. The causal relationship between FDI and economic growth is a two-way relationship.

Pradhan (2019) researched on the impact of FDI on economic growth in the 5 ASEAN countries. The data set consists of annual time series data from 1970 to 2009, which accessed from both IFS and World Bank. The results indicated that FDI was positively and significantly related to economic growth at both panel and individual level for the countries apart from Indonesia, Malaysia and Philippines at individual level. Nevertheless, when Granger causality test was done and revealed existence of bidirectional causality both at individual and panel level with exception of Malaysia.

Hailu (2016) researched the influence of FDI on trade balance in African states for the period between 1980 and 2007. The study deployed the Least Square Dummy Variable (LSDV) regression method. Study findings revealed a positive and significant influence of FDI on balance of trade. This influence is largely brought by export promotion hence being greater than offset by its negative influence of improving imports as most of these countries largely depend on imports. The FDI elasticity which is significantly positive reveals that FDI significantly contribute to the export part of the continent. Expansion of FDI in the area will positively influence export promotion as well as the balance of trade. Foreign investors should be directed by investment policy makers in those nations to areas with domestic factor intensive investments, export promotions and import substitution

In Cote d' Ivoire,Yaoxing (2017) researched on the long-run influence of FDI and trade openness on economic growth by use of data span for the period 1980-2007. The study used an explanatory research design. Study findings revealed that, FDI, trade openness and output had a long run relationship. Both FDI and trade openness had a significant influence on output growth in Cote d'Ivoire. The Granger causality indicated unidirectional causal relationship ranging from FDI, trade openness to output and from output, FDI to trade openness.

In Kenya, Maingi (2018) conducted a research on FDI in Kenya. The study aimed at revealing the factors affecting FDI in Kenya. The research deployed descriptive study. The findings of the study findings revealed that the key factors affecting FDI in Kenya are market size, taxation, table macroeconomic policies and a level of human capital that is tolerable by investors. Human capital was insignificantly relating to overall economic growth which indicates shortage of skilled labor in Kenya

2.3.5 Inflation

Inflation is defined as a condition whereby the value of a certain currency reduces significantly (Kiran, 2017). It could refer to the raise in product prices of a country. In case of inflation, nearly all sectors specifically in the economy gets affected, these ranges from global business operations to the common citizens. The high prices make its unfavorable to undertake in numerous transactions as before. Inflation is seen as an economic crisis and therefore each government ensures that the inflation levels are kept relatively low. However, inflation may also result in positive effects whereby an organization invests heavily before inflation has occurred and later benefit during the inflation period.

Kumar et al. (2016) researched on the effects of inflation on the balance of trade in America. The study used panel data from the year 1991 to 2008. The study adopted a descriptive research design. The study focused on the fluctuations of the inflation rate, the foreign exchange rate and the interest rate on balance of trade. Findings revealed that inflation and foreign exchange rate were positively related to BOP while interest rate had a negative impact on BOP America.

In Pakistan, Munir and Kiani (2020) applied the VECM and cointegrating approach to determine the relationship between trade balance and inflation. The study used time series data from period 1976 -2010. The variables considered were real agriculture value added, real exchange rate, real gross domestic product, financial market openness, money and quasi money and used openness, import openness and export openness ratios. The study revealed a positive relationship existed between trade balance and inflation in the long run. Study findings for Trade and Export Openness proxy revealed that Inflation Rate has an automatic adjustment mechanism and that the economy responds to deviations from equilibrium in a balancing manner. Inflation control should be done by use of both non fiscal and non-monetary measures like production capacity, sound managerial system, rationing policy and financial system since it is a major barrier to country development.

In Malaysia, Roslan (2018) conducted a research to determine the relationship between inflation and balance on trade. The study adopted a descriptive research design and adopted multiple regression models in the analysis of the association between the variables. The study found that inflation has a negative influence on trade balance. The BOP may worsen since domestic inflation encourages import spending for they tend to be less expensive, on the other side exports decreases since they don't attract foreign buyers due to their high prices.

A study by Lotfalipour et al. (2018) assessed the relationship between inflation and trade among MENA countries, that is, North Africa and Middle East countries. These countries are among the top oil producing countries in the world hence, the study wanted to test if the hypotheses holds for oil producing countries or in oligopolistic markets. Descriptive research design was adopted. The study used a panel data equation and techniques covering the period 1990-2010. The study used inflation as the dependent variable and GDP/Capita, annual population growth and net exports as a percentage of GDP and openness as the independent variables. The two ways fixed effect variables showed that there exists a negative relationship between openness and inflation for oil producing countries.

In Kenya, Wahu (2016) investigated on the relationship between trade balance and inflation. The study used an explanatory research design and the population of interest in this study is the Kenyan economy. The

study employed Autoregressive Distribution Lag as well as ECT to the long and short run dynamic of the model and deviation equilibrium. The data used in this study was annual data and time series in nature that range from the year 1975 to 2015. The study found out that there was a negative association between inflation and trade balance in Kenya. Inflation is a major macroeconomic factor that facilitates the development for a country. Stable inflation level is desirable and from the analysis the relationship between inflation and openness is insignificant thus inflation should be controlled by monetary measures such as controlling the level of unemployment.

2.4 Conceptual Framework

This section presents the conceptual framework of independent and dependent variables which are used in this study. The independent variables included: foreign exchange rate, foreign direct investment, inflation as well as Interest rates. The dependent variable is balance of trade. The conceptual framework was as presented in Figure 2.1.

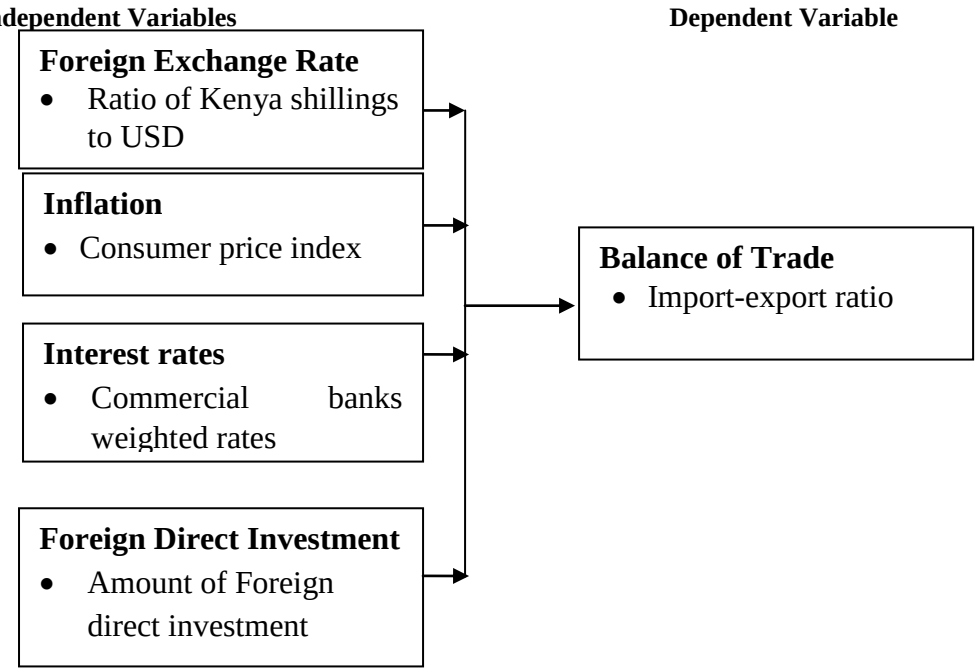

Figure 2. 1: Conceptual Framework

Rate of exchange has a considerable influence on trade and its increase or decrease can lead to trade deficit of surplus. The prices of goods and services for local and foreign use are determined directly by the exchange rates. The cost of importation of goods and services for industrial production increases with increase in exchange rates. This in turn raises the production cost whose effects are passed onto the consumers in form of costly prices (Cengiz, 2018). Costly priced goods cannot compete favorably in foreign markets, which in turn lead to a decrease in exportation of goods. The exchange rates affect the local currency on the credit side in terms ofexports of goods and services. Therefore, an increase in exchange rate can lead to a decrease in exportation and decrease in exportation (Agbola, 2016).

An increase in interest rates increases exports since it makes local goods and services more competitive (Cengiz, 2018). High rate of interest increases savings and reduces borrowings; therefore, this in return reduces the disposable income after payment of mortgage costs which are high. The state of current account will be improved due to reduced import expenditure which is as a result of reduced consumer spending. In addition, an increase in interest rates, reduces borrowing, which in turn reduces the rate of production and hence exportation. This implies that consumers will get products from outside the country, leading to an increase in importation (Shawa & Shen, 2016). Therefore, interest rates can affect the balance of trade by leading to an increase in importation and decrease in exportation.

An increase in inflation leads to an increase in importation and decrease in exportation, due to the high cost of production (Roslan, 2018). The level of export or import in a country depends on local price levels, the rate of inflation among other factors (Biller, 2007). Increase in local prices has an adverse effect on the international transactions of a country which are shown on the balance of payment. Increase in inflation rate in the local market lowers exports since foreigners will not be attracted by the local goods. Furthermore, the

amount of goods and services imported will increase since residents will automatically go for foreign goods due to high prices in the local commodities. An adverse balance of payment disequilibrium easily results due to more imports than exports resulted from increase in local inflation, in case the disequilibrium is not kept within limits, crisis in the in the BOP can easily result (Munir & Kiani, 2020).

Foreign direct investment leads to an increase in local production and hence an increase in exportation as compared to importation. Foreign direct investment occurs when investors, usually global firms, in the home country make transactions with their control management in another country (host country) (Kiran, 2017). Frequently, the motivation behind these firms is to ensure local production in the host country goods and services that had earlier been exported from the home nation, and to the extent that this happens, foreign direct investment substitutes the home country exports. But the home country transactions of a global firm can be vertically connected to host country transactions, in that increase in the transactions in the latter creates increased demand for intermediate goods and services with inclusion of capital goods from the former country (Pradhan, 2019).

2.5 Research Gaps

Numerous studies have been done on the influence of foreign exchange rates on balance of trade. However, besides being conducted in various parts of the globe, these studies have shown mixed findings. For instance, Senadza and Diaba (2017) revealed that foreign exchange rate had no significant relationship with trade balance. Nevertheless, Chowdhury et al. (2018) stated that foreign exchange rate was significantly related to balance of trade. Studies conducted in Kenya focused up to the year 2013 and since 2013 there has been a significant increase in foreign exchange rates.

Numerous studies have been done on how FDI relates to balance of trade in different countries. Kiran (2017) researched on the influence of FDI on trade balance in Turkey and found that FDI had no influence on trade. Hailu (2016) researched the influence of FDI on trade balance in African states and found that they were positively related. Besides showing mixed results, the findings of one country cannot be generalized to another due to differences in macroeconomic factors. Studies done in Kenya focused on the relationship between FDI and economic growth, which is different from balance of trade.

There are various studies that have been done on inflation and balance of trade. For instance, Kumar et al (2016) researched on the relationship between inflation and balance of trade in the United States and found that inflation positively influences balance of trade. However, (2018) found that inflation in Malaysia affects balance of trade negatively. Also, Wahu (2016) found that inflation has a negative effect on balance of trade.

In the country, there is limited empirical content on how the rate of interest affects the amount of trade balance. As mentioned above, the few studies cited focused on the effect of FDI, exchange rate and the rate of inflation. Going by the classical theory of investment, there is a relationship between interest rate and exports through increase in production. To better understand this relationship, the current study goes further to incorporate the effect of interest rate on the amount of trade balance in the country in addition to the other macroeconomic variables.

III. Research Methodology

3.1 Introduction

The chapter entails presentation of research methodology that was adopted in the current study. Specifically, the chapter focuses on presentation of research design, targeted audience and instrument of data collection, data analysis as well as presentation.

3.2 Research Design

Research design is defined as an overall strategy that is adopted so as to integrate various elements or components in a particular study so as to effectively address research problem (Metsamuuronen, 2017). Causal research design was employed when conducting this study. The technique is very effective when determining the influence of one element on another element or in other words, the research design determine causation among variables under investigation. Causal research technique enables the researcher to determine causal association between or among elements under investigation (Kumar, 2019). The technique was applicable in the current research since it entails data collection, verification and combination of results from diverse sources so as to establish whether to refute or defend the research hypothesis.

3.3 Empirical Modeling

The research involves multivariate time series which is an economic methodology where the time series yt depends on the lags of itself and the lags of another seriesy2t. In this case the main methods of analysis was either VAR or VECM depending on the whether the series has no cointegration or not. If the variables have cointegration which implies that the variables co-move towards a long-run equilibrium then VECM will apply otherwise will use VAR.

The standard VAR model where k = 1 will apply

$y_t = A_0 + A_1 y_{t-1} + U_t$ ……(1)

Where y_t is vector of dependent variables

A_0 is vector of constant

A_1 is matrix of coefficient for the variable at lags

U_t is vector of white noise

y_{t-1} is vector of the variables at lags

In this case there are four variables i.e. Interest Rate (denoted IR) Foreign Exchange rate (denoted by FX), Foreign Direct Investment (denoted by FDI), and Inflation denoted as In. In this case therefore the above equation looked like;

$$\begin{pmatrix} y_{1t} \\ y_{2t} \\ y_{3t} \\ y_{4t} \end{pmatrix} = \begin{pmatrix} \beta_{10} \\ \beta_{20} \\ \beta_{30} \\ \beta_{40} \end{pmatrix} + \begin{pmatrix} \beta_{11}\ \alpha_{11}\ \theta_{11}\ \Omega_{11} \\ \alpha_{21}\ \beta_{21}\ \theta_{21}\ \Omega_{21} \\ \theta_{31}\ \beta_{31}\ \alpha_{31}\ \Omega_{31} \\ \Omega_{41}\ \beta_{41}\ \alpha_{41}\ \theta_{41} \end{pmatrix} \begin{pmatrix} y_{1t-1} \\ y_{2t-1} \\ y_{3t-1} \\ y_{4t-1} \end{pmatrix} + \begin{pmatrix} U_{1t} \\ U_{2t} \\ U_{3t} \\ U_{4t} \end{pmatrix} \text{ ……..……(1)}$$

The first system

$y_{1t}\ (FX) = \beta_{10} + \beta_{11}\ y_{1t-1}$(FX) $+ \alpha_{11}\ y_{2t-1}$(FDI) $+ \theta_{11} y_{3t-1}$(In) $+ \theta_{11} y_{3t-1}$(IR) $+ U_{1t}$ ……(2)

The second system

$y_{2t}\ (FDI) = \beta_{20} + \alpha_{21}\ y_{2t-1}$(FDI) $+ \beta_{21}\ y_{1t-1}$(FX) $+ \theta_{21} y_{3t-1}$(In) $+ \theta_{11} y_{3t-1}$(IR) $+ U_{2t}$ ....(3)

The third system

$y_{3t}\ (In) = \beta_{30} + \theta_{31} y_{3t-1}(In) + \beta_{31}\ y_{1t-1}$(FDI) $+ \alpha_{31}\ y_{2t-1}$(FX) $+ \theta_{11} y_{3t-1}$(IR) $+ U_{3t}$ ….....(4)

The forth system

$y_{4t}\ (IR) = \beta_{40} + \theta_{41} y_{4t-1}(IR) + \beta_{41}\ y_{1t-1}$(FDI) $+ \alpha_{41}\ y_{2t-1}$(FX) $+ \theta_{11} y_{4t-1}$(In) $+ U_{4t}$ ….....(5)

The first step is to check if the variables are stationary, if not make them stationary then choose the number of lags using information criteria and then check for co-integration. If the variables co-integrate use VECM otherwise VAR model will be used.

3.4 Target Population

Targeted audience refers to elements, individuals, objects or items under investigation (Creswell & Creswell, 2017).

This study was conducted in Kenya and covered a period of 48years, starting from 1971 to 2018. This period was selected due to availability of data. In addition, the number of years has to be more than 30 (large sample size) for inferential statistics to be run.

3.5 Data Collection Instruments

The current research used secondary time-series data when observing behavior of elements under investigation. Secondary data refers to any data that has been collected by an individual other than the user: thus making information readily available for utilization (Egbert, 2018). In this study, secondary data covered a period starting from 1971 to 2018. This data was obtained from CBK's and KNBS's websites. More specifically, data on foreign exchange rate, foreign direct investment and inflation was retrieved from the CBK's websites otherwise data on balance of trade was obtained from International Monetary Fund, World bank and KNBS. The secondary data was collected by use of a data extraction checklist. The intent of using data extraction checklist is to provide guidance among reviewers on various types of prudent information that extracted from secondary sources (Fraenkel, 2019). Data extraction checklists was categorized into five columns as per the years and variables of the study, which include interest rates, foreign exchange rate, inflation, balance of trade and foreign exchange rate.

3.6 Data Analysis and Presentation

Secondary data that was collected during the study was quantitative in nature. Thereafter, the quantitative data will be edited, coded and analyzed through the aid of statistical package known as Strata version 14. Inferential and descriptive statistics were used to analyze quantitative data. Descriptive statistics entailed computation of percentages standard deviation and means.

3.6.1 Diagnostic Tests

The time series analysis tests that were performed on the model include normality test, Heteroscedasticity Test, Autocorrelation, Linearity test, Stationarity and Unit Root Test and Co-integration test.

3.6.1.1 Normality Test

The main assumption in normality test is that all elements under investigations are obtained from a population that is normally distributed. Intuitively, normality is perceived as results obtained from a large number of randomly occurring invents. Statistical tools are at time erroneous; same principle is applied in normality test assumptions. In real life situation, it is possible for an individual to obtain data from a normally distributed population. Nonetheless, most of naturally occurring events are normally distributed. In the current research, Shapiro Wilk test was used to test for normality (Greenfield & Greener, 2016). The test's null hypothesis is that a particular population under investigation is distributed normally. Henceforth, in case the p value is less than

selected alpha value, then the null hypothesis is rejected implying that data is obtained from a population that is not distributed normally. Otherwise, when the p value is greater than the alpha value, it implies that data is obtained from a normal distribution. Henceforth it is imprudent to reject the null hypothesis.

3.6.1.2 Autocorrelation Test

Autocorrelation results to data biasness hence spurious estimations. The current research used Breusch-Godfrey Langrage Multiplier to test for the presence or absence of autocorrelation. Serial correlation depicts the presence of correlation between stochastic erroneous terms of subsequent timeframe (Hewson, Vogel & Laurent, 2016). Autocorrelation can be rectified through utilization of robust standard errors. Null hypothesis indicates the absence of serial correlation.

3.6.1.3 Heteroscedasticity Test

The present research determined residual variation across all elements under investigation through utilization of residual plot (Kumar, 2019). Since the residual plot technique is regarded as subjective, Breusch-Pagan/Cook-Weisberg test was also used to test of heteroscedasticity. Presence of autocorrelation results to results biasness consequently leading to spurious estimations. The researcher used Breusch-Godfrey Langrage Multiplier test for autocorrelation.

3.6.1.4 Stationarity Test

Data stationarity was determined through the use of Augmented Dickey Fuller unit root test (ADF). The technique was adopted during the study since autocorrelation does not affect it (Metsamuuronen, 2017). In case a particular data contains unit root and requires differentiation for it to be stationary, hence the elements under investigation is passive to have long-run relationship will dependent variable henceforth requires co-integration test to be performed. In case exogenous data undergoes ADF test and happen to be at stationary level, it is assumed that the data has short term effects on the model.

3.6.1.5 Linearity Test

Linearity test assumes that the association between dependent and independent variables are linear in nature. It is prudent to check for the presence of outliers since they significantly affect linear regression (Fraenkel, 2019). Scatter plot was used to test for linearity assumptions. Scatter plot is drawn using both y and residual values. The Y values are represented on y axis while residual values are represented on x-axis. In case scatter plot depicts linear patterns, it indicates that the linear assumption is achieved or met.

3.6.2 Model Specification

The regression model was expressed as follows;

$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \varepsilon_t$ …… (6)

Y_t is the dependent variable (balance of trade), B_0 is the y intercept (Constant), β_1- β_3 and coefficients of determination, $X_{1t}$is the foreign exchange rate, $X_{2t}$is the interest rate, X_{3t} is inflation,X_{4t} is foreign direct investment, t represents time and ε_t is an error term.

3.6.3 Ethical Considerations

The researcher adhered to ethical consideration when conducting the present study so as to improve on the study's credibility. Since the data is freely available in the internet, specifically in International Monetary Fund, the World Bank, Kenya National Bureau of Statistics and the Central Bank of Bank websites, permission to obtain and utilize the data was not required. However, the ownership of the original data was acknowledged in the study.

3.7 Measurement of the variables

3.7.1 Dependent variable

Balance of Trade: refers to the measure of imports a particular economy can get per unit exportation of commodities. It can also be defined as the relative importation prices that is expressed in the ratio of exportation and importation prices (Senadza & Diaba, 2017).

3.7.2 Independent variables

Foreign exchange rate: Refers to rate of exchange that determined by legally-sanctioned exchange markets or national authorities. It is normally calculated in term monthly averages or annual averages (local current unit compared to U.S dollar) (, 2018).

Interest Rate: Refers to loan proportion that is normally charged as borrower's interest and it is expressed as annual percentage of total outstanding loan. Weight average interest rate is calculated from interest rates that are outstanding, weighted by the total amounts of deposit-fixed with every interest rate (Hailum, 2016).

Inflation: This is the rate at which the general level of prices for goods and services is rising and, consequently, the purchasing power of currency is falling. This will be measured by use of the percentage change in consumer price index. The consumer price index measures the changes in the cost of a basket of consumer goods and services (Senadza & Diaba, 2017).

Foreign Direct Investment: This is an injection of foreign funds or capital including equity capital into an enterprise that operates in a different country of origin from the investor. This will be measured by use percent of the GDP (Kiran, 2017).

Table 3. 1: Summary of the variables measurement

Variable	Measure
Balance of trade	Import/export ratio
Foreign Direct Investment	Percent of GDP
Foreign exchange rate	Ration of KSH/USD
Inflation	Percentage change in consumer price index
Interest rates	Commercial banks weighted rates

IV. Research Findings And Discussion

4.1 Introduction

The section will involve a detailed analysis of data collected from various sources in order to address the study objectives. The broad objective of the current study was to find theeffect of macroeconomic variables on balance of trade in the country. The specific objectives on the other hand sought to determine the effect of foreign exchange rate, inflation, interest rate and foreign direct investment on balance of trade in Kenya. The first section in this chapter is the descriptive statistics, followed by trend analysis, diagnostic tests, unit root test and inferential statistics that include correlation and regression analysis. The findings are presented in tables and figures.

4.2 Descriptive Statistics

This part comprised of computation of standard deviation, mean maximum and minimum of the variables. In this research descriptive statistics involved computation of percentage, standard deviation, frequencies and mean of the dependent variable (balance of trade) and the independent variables (inflation rate, FDI, interest rates and exchange rate).

From Table 4.1,it can be seen that, the average in trade balance for the country was approximately -6.496396 between year 1971 and 2018. The indication in this case is that, on average, the country experienced a deficit in the balance of trade for the indicated period During the same period, the minimum and maximum amount ever recorded in the balance of trade was -17.2 and the maximum was 4.95

Foreign exchange was another macroeconomic variable under consideration. For the period between 1971 and 2018, the mean value for the variable was approximately 47.64534 with a standard deviation of about 34.04841. In the same period, the minimum and maximum values of the variable were 7 and 103.374 respectively.

Foreign direct investments were the other macroeconomic variable under consideration in the current study. The variable was captured in terms of net inflows as a percent of the GDP for the indicated study period. The study found out that, the mean value for the variable was approximately 0.75079 with a standard deviation of about 0.7476061.

The study further found out that, the minimum value for the foreign direct invest in the period was approximately 0.00457345 per cent. The maximum value ever recorded in the period under consideration was 3.457345.

The average value for the consumer price index (CPI) for the period under consideration was approximately 11.95222 with a standard deviation of 8.034469. The study further found out that, the minimum and maximum values for the rate of inflation in the country was 1.554328 and the maximum was 45.97888 respectively.

The study further found out that, the mean interest rate for the period under consideration was 16.65521 percent with a standard deviation of 6.675163 percent. The results further showed that, the minimum and maximum values recorded for the variable was 9 percent and was 36.24 percent respectively.

Table 4. 1: Mean Estimation

Variable	Obs	Mean	Std. Dev.	Min	Max
ToT	48	-6.496396	4.563484	-17.2	4.95
FDI	48	.75079	.747534	.004721	3.457345
In	48	12.02986	7.986484	1.554328	45.97888
IR	48	16.65521	6.675163	9	36.24
FX	48	47.64521	34.04794	7	103.37

4.3 Trend Analysis

4.3.1 Foreign exchange rate

Foreign exchnage rate was measured in terms of real exchnage rate. Figure 4.1 shows the trend of exchnage rate for the period between 1971 and 2018. According to the findings, exchnage rate has been steadily increasing for the period 1971 and 2018. The lowest foreign exchange rate during the period 1971 and 2018 was in 1971 at 7.14. The highest foreign exchange rate was in the year 2017 and was at 103.37. The results indicate that

exchange rate in Kenya has been steadily increasing over the years, which implies the depreciation of the Kenyan shilling against the United States Dollar.

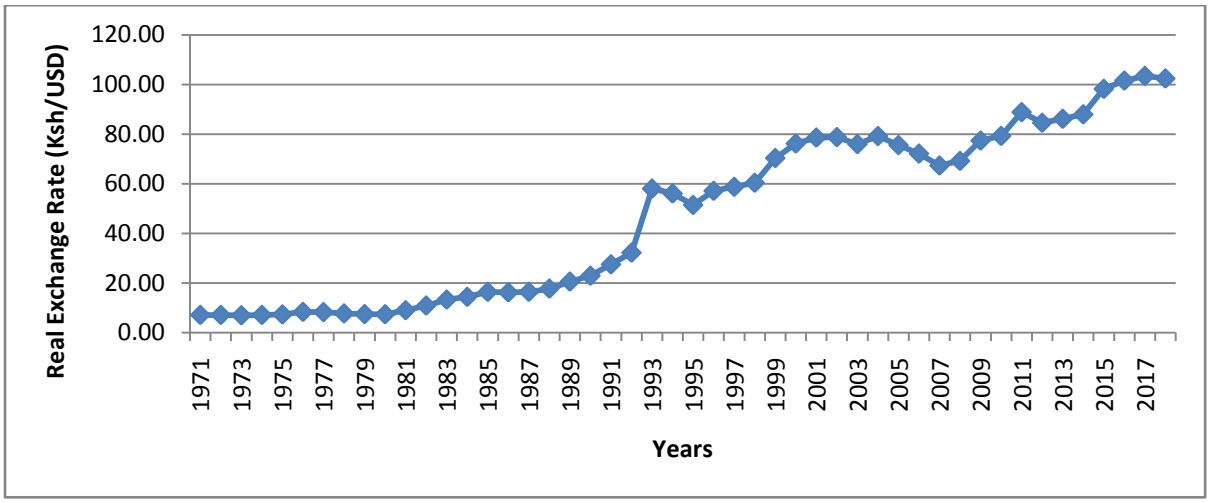

Figure 4. 1: Trend of Foreign Exchange Rate (1971-2018)

4.3.2 Foreign Direct Investment

Foreign Direct Investment was measured as net inflows as per cent of GDP. Figure 4.2 shows the trend of FDI for the period ranging from 1971 to 2018. From the findings, foreign direct investment has been fluctuating over the years. The highest foreign inflow in Kenya was in the year 2011 at 3.46 per cent. Other years that had high foreign inflows were in the years 1993 at 2.53 and 2007 at 2.28. During the study period, the years with the lowest foreign direct investment foreign inflows were in 1998 at 0.00 per cent, 1992 at 0.08 per cent, 1994 at 0.10 per cent, 2001 at 0.04 per cent and 2005 at 0.11 per cent. These findings imply that FDI has been fluctuating over the years for the period between 1971 and 2018. The increase of foreign direct investment to 2.53 followed the tribal clashes of 1992, which the spike in foreign direct investment in 2007 followed the post-election violence. The increase FDI in 2011 followed the promulgation of the constitution of Kenya 2010 because of the optimization the corruption will be tamed leading to an improvement in development.

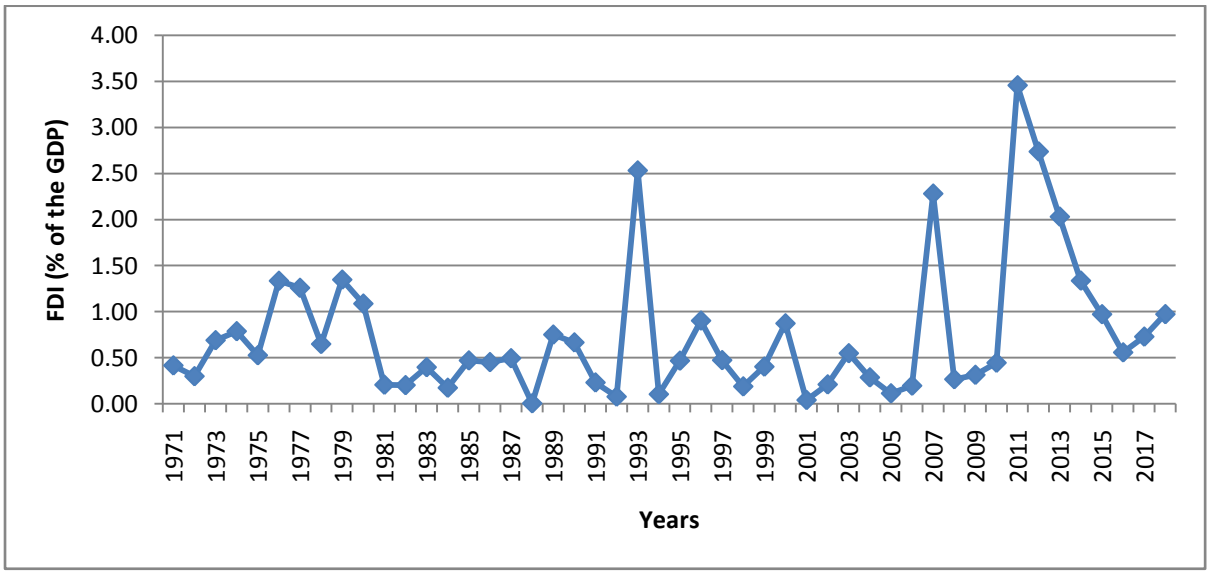

Figure 4. 2: Trend of Foreign Direct Investment (1971-2018)

4.3.3 Inflation

Inflation was determined by use of CPI. Figure 4.3 shows the trend of inflation rate for the period ranging from 1971 to 2018. From the findings, inflation in Kenya has not been stable over the years with the highest inflation being in the year 1993 at 45.979. Other years that had high inflation included 1992 with an inflation of 27.332, 1994 with an inflation of 28.814, 2008 with an inflation of 26.240 and 1982 with an inflation of 20.667. The years with the lowest levels of inflation were 1995 at 1.554, 2002 at 1.961, 1986 at

2.534, 1971 at 3.780 and 2010 at 3.961. These findings imply that inflation in Kenya measured in terms of consumer price index has been fluctuating over the years. In 1985 the price control act was repealed leading to swinging of prices leading to increasing inflation. In addition, 1988 was the last election under single part and was hotly contested and the government was using printing of the Kenya shilling notes leading to increase in inflation. In 2008, consumer price index increased as a result of post-election violence and increase in the prices of goods and services.

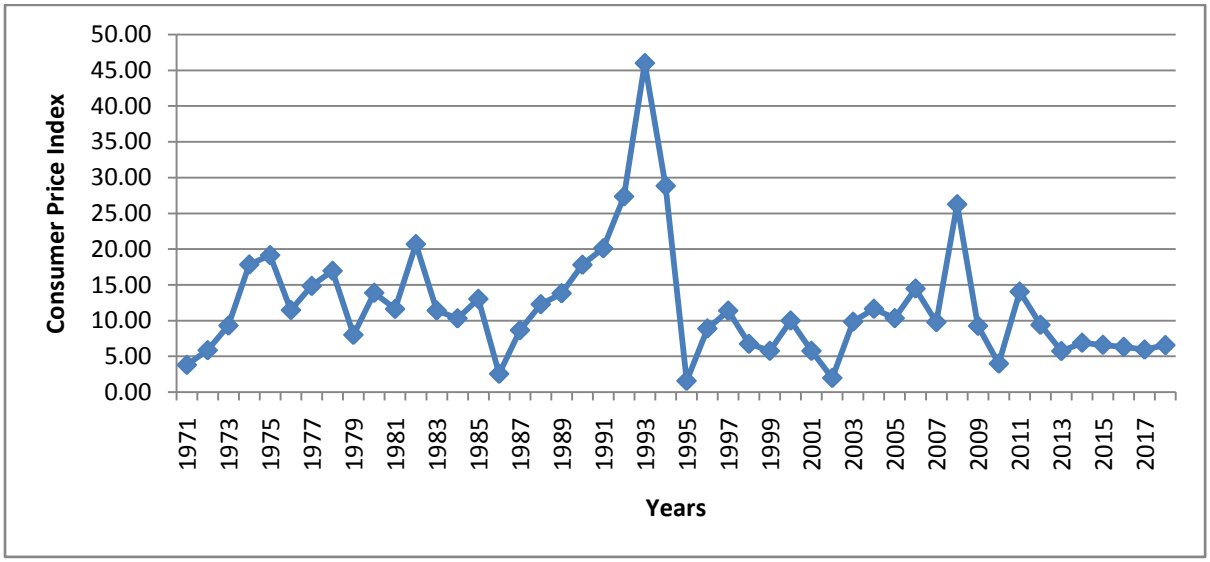

Figure 4. 3: Trend of Consumer Price Index (1971-2018)

4.3.4 Interest Rates

Figure 4.5 shows the trend of interest rates in Kenya for the period between 1971 and 2018. From the findings, interest rates in Kenya have been fluctuating during the study period. The interest rate was at 9 percent in the year 1971, but increased steadily to 15.83 percent in the year 1983. The interest rates increased steadily to 36.24 percent in 1994, before creasing to 28.80 percent in 1995 and increased to 33.79 percent in 1996. This figure then decreased steadily to 12.53 percent in 2004. In the year 2012, interest rate in Kenya was at 19.72 percent, but decreased steadily to 13.67 percent in 2017 and 2018. By April1994, commercial banks could borrow for a maximum of only four days and could not exceed ten days in any one month. Bank lending in the inter-bank market did not qualify for borrowing from the CBK on the same day. A penalty of 0.2% per day was introduced for banks that failed to comply, and banks that failed to meet the cash ratio for over 30 days were placed under the statutory requirement.

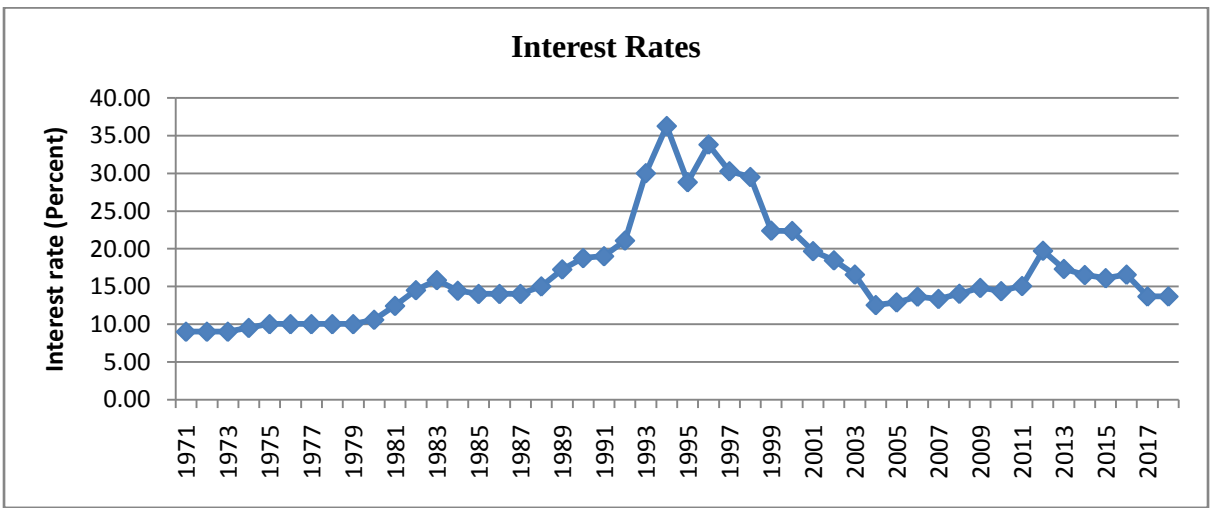

Figure 4. 4: Trend of the Interest Rates

4.3.5 Balance of Trade

Balance of trade was measured in terms of import/export ratio. Figure 4.5 shows the trend of Trade Balance for the period ranging from 1971 to 2018. According to the findings, balance of trade in Kenya has been fluctuating for the period 1971 and 2018. The lowest balance of trade was in the year 1971 at -17.20 per cent. Other years during the study period that had low Trade Balance include 1972 at -14.70 per cent, 1977 at -13.28 per cent, 1986 at -11.03 per cent, 2006 at -10.56 per cent, 2007 at -10.80 per cent and 2010 at -13.13 per cent. In addition, the years with the highest level of balance of trade were 1992 at 4.95 per cent, 2008 at 3.37 per cent, 1993 at 2.81 per cent and 1997 at 0.69 per cent. The findings show that balance of trade in Kenya has been fluctuating over the years due to changes in the importation and exportations as a result of FDI, interest rate, inflation and exchange rate among other factors.

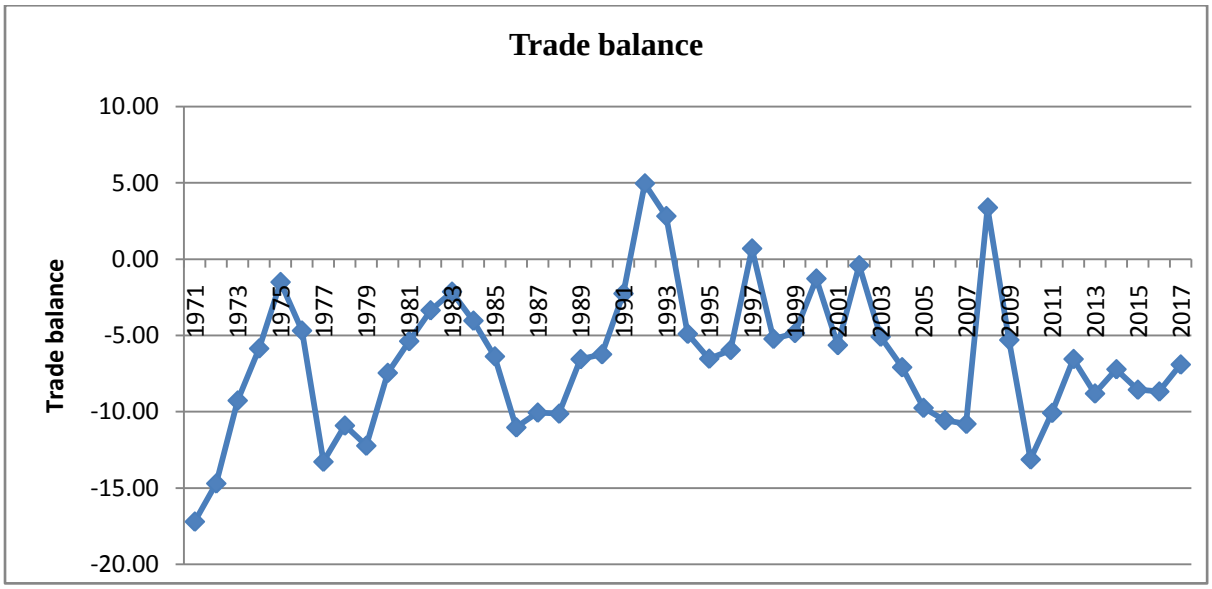

Figure 4. 5: Trend of the Trade Balance

4.4 Diagnostic tests

Regression analysis is one of the techniques used by economists and other policy analysts in other fields as a model of analysis in the estimation process. The method can also be used to find the influence of multiple exogenous explanatory variables on the endogenous variable. However, for this estimation process to produce reliable results, there are a number of assumptions that must be made. In addition, the data to be used in the analysis, must fulfil a number of conditions for the results to be deemed legit. For this reason, the data must be exposed to a number of diagnostic tests before the actual regression analysis is conducted. If this is not done, the results of regression analysis are spurious.

In the current study, diagnostic tests carried out focused on areas of autocorrelation, heteroscedasticity that analyze whether or not there is a constant variance, linear test and multicollinearity tests and unit root tests.

4.4.1 Test for Normality

One of the conditions required in the regression analysis is that there is a linear relationship between the variables to be used in the regression analysis. To test whether this is the case or not, there are a number of tests that can be used. The current study focused on Shapiro-Wilk W normality test. The null hypothesis assumes that the data is obtained from a normal population. This hypothesis is tested against the null hypothesis which indicates that, the data is not normally distributed.

To reject, or failing to reject the null hypothesis is based on p value. If P value obtained is greater than 0.05 at 95% confidence interval, don't reject the null hypothesis. The conclusion therefore is, the data is obtained from a population with normal distribution.

In the current study, results of the analysis indicated that, the p-value from balance of trade, one of the macroeconomic variables, was approximately 0.201. At 5% level of significance, this value is greater than 0.05. Where this is the case, don't reject the null hypothesis. The study concluded that, the variable was normally distributed.

Interest rate was the other macroeconomic variable used in the study. Analysis results indicated that, the P calculated value was 0.165 which is greater than 0.05 at 5% level of significance. The study therefore

concluded that, the variable was normally distributed. For the case of inflation, thecalculated p-value was 0.098 which was also greater than 0.05 at % level of significance. The study therefore concluded that the variable was normally distributed.

The other macroeconomic variable used in the analysis was foreign direct investment (FDI). Results of the analysis indicated that, the calculated P value was approximately 0.134. This value is greater than 5% which indicate that the variable was normally distributed. For the case of foreign exchange rate, the calculated P value was 0.128 which is also greater than 5%. This is an indication that the variable was normally distribute.

Table 4. 2: Shapiro Wilk Test Results

	Obs	W	V	Z	Prob>z
Balance of trade	48	0.8452	13.897	6.008	0.201
Interest rate	48	0.8623	13.762	5.982	0.165
Inflation (consumer price index)	48	0.8782	10.132	5.172	0.098
Foreign Direct Investment	48	0.8701	12.782	5.425	0.134
Foreign Exchange rate	48	0.8787	12.132	5.601	0.128

4.4.2 Autocorrelation Test

This is another assumption that must be fulfilled before exposing any data to the process of regression analysis. It is carried out to make sure that any to variables or more are not related. Just like in the other tests in the process of regression, there are a number of ways that this can be done. In the current study, the Breusch–Godfrey test was used.

In particular, the test assumes that, there is a presence of autocorrelation between two or more variables used in a particular model. Where this is present, it is assumed that, inaccurate conclusion will be drawn from the results obtained.

The method is based on testing the null hypothesis which is formulated to state that, there is there is no serial correlation in the data set of the variables under consideration. If the calculated P value is greater than critical P value at 5% level of significance, don't reject the null hypothesis. The conclusion is, there is not autocorrelation.

The joint autocorrelation test carried out using the stated method as can be seen from Table 4.3 shows that the p-value is 0.1713. This calculated value is greater than the critical value at 5% level of significance. The study therefore failed to reject the null hypothesis. The conclusion was, there is no autocorrelation.

Table 4. 3: Breusch-Godfrey Langrage Multiplier test

Breusch-Godfrey LM test for autocorrelation

lags(*p*)	chi2	df	Prob > chi2
1	1.872	1	0.1713

H0: no serial correlation

4.4.3 Heteroscedasticity Test

This is another test that must be carried out before exposing time series data to regression analysis. Homoskedasticity is a situation where the variance of the error term for all the data is constant. The opposite is heteroscedasticity which implies that the variance is not a constant.

For the regression analysis to produce meaningful results, it is required that the error terms must be homoscedastic and not heteroscedastic. In the current study, Breusch-Pagan/Cook-Weisberg was used to test the null hypothesis that the error variances were constant. This was tested against the alternative hypothesis that the error variances are a multiplicative function of one or more variables. Conclusion is based on the value of calculated P as compared to critical p-value. If p-value is less than 5%, this particular test concludes that there is no heteroskedasticity.

From the results of analysis as can be seen in table 4.4, the calculatedp-value was 0.0293. This is less than critical value at 5% level of significance.The study therefore concluded that, there was a constant variance.

Table 4. 4: Breusch-Pagan/Cook-Weisberg test

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of BoT

         chi2(1)      =     4.75
         Prob > chi2  =   0.0293
```

4.4.4 Multicollinearity Test

Creswell (2014) observed that, multicollinearity is a situation in which two or more explanatory variables in a regression analysis are correlated. One of the requirements in multiple regression analysis is that, variables should not be correlated.

Multicollinearity is not a desirable situation in a regression model since it increases standard errors in the analysis process. This means that, the t values will be underestimated, a factor that may lead to wrong conclusion. This is because the t values are used in hypothes testing just like the P values.

Multicollinearity level of severity in a data set can be examined by use of variance inflation factor (VIF). Primarily, VIF is an index measuring the rise in projected regression coefficient variances due to collinearity. According to Russell (2013), a VIF greater than 10 necessitates further investigations.

From the analysis of data in the study, it was found out that, the VIFfor FDI was 1.49, foreign exchange rate had a VIF of 1.43, inflation had a VIF of 1.38 and interest rate had a VIF of 1.31. In addition, the average VIF was 1.40.

Table 4. 5: Variance Inflation Factor

Variable	VIF	1/VIF
FDI	1.49	0.670686
FX	1.43	0.697640
In	1.38	0.724335
IR	1.31	0.765231
Mean VIF	1.40	

4.4.5 Linearity Test

The ordinary least square assumes that there is a linear association between the dependent and independent variables used in the regression process. There are a number of ways to establish linearity in the regression process just like in the other regression tests of the data set.

In the current study, linearity of the data set was examined by use of a scatter plot. Similarity between scatter plots and line graphs is that they both use x and y axis when plotting data points. Scatter plot is a technique that can be used to test the effect of the independent variable drawn on the X axis, on dependent variable presented on the Y axis.

From the results in Figure 4.6, there exists a positive and linear relationship between foreign exchange rate and balance of trade in Kenya. Moreover, the findings show that foreign exchange rate, measured in terms of Ksh/USD ratio, can explain 1.6% of the balance of trade in Kenya, measured in terms of import/export ratio. However, despite having a line of best fit, the values of foreign exchange rate were widely dispersed showing the fluctuation of the foreign exchange rate.

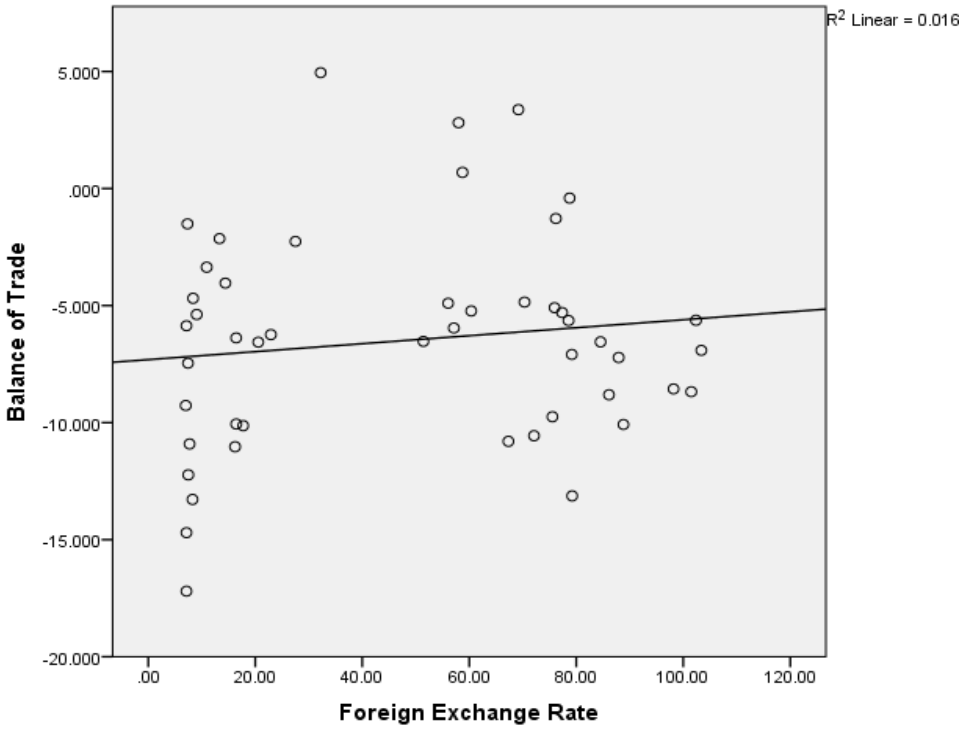

Figure 4. 6: Scatter Plot for Foreign Exchange Rate and Balance of Trade

As per the results in Figure 4.7 FDI and balance of trade in Kenya have a linear and positive relationship. Further, the results show that FDI, measured in terms net inflows as a percent of the GDP, can explain 42.5% of the balance of trade in Kenya, measured in terms of import/export ratio.

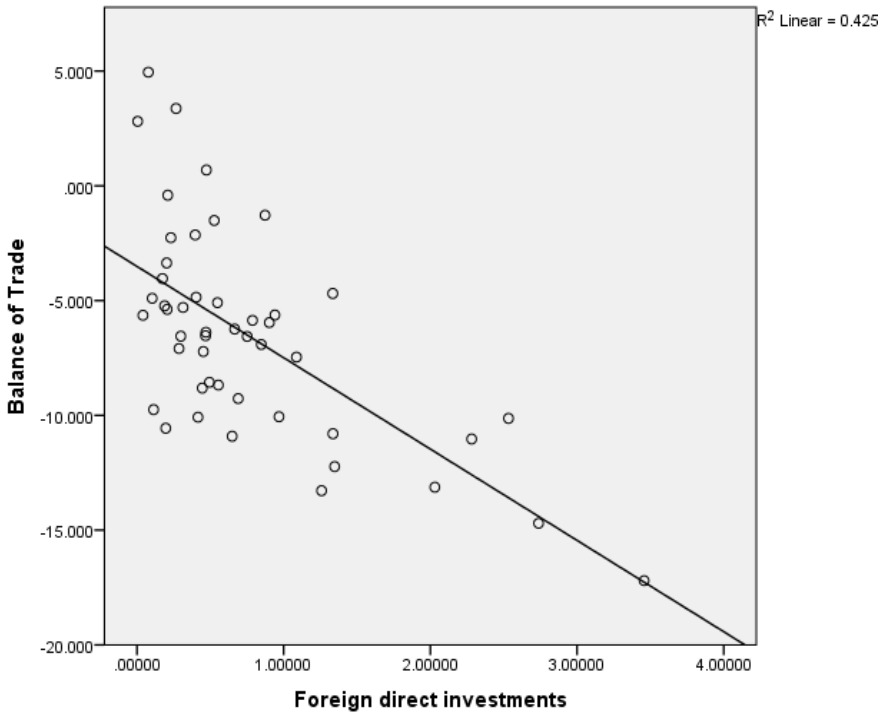

Figure 4. 7: Scatter Plot for Foreign Direct Investment and Balance of Trade

As indicated in Figure 4.8, inflation rate (CPI) and balance of trade in Kenya have a positive and linear relationship. Further, the results show that inflation, measured in terms of CPI, can explain 28.8% of the balance of trade, measured in terms of import/export ratio.

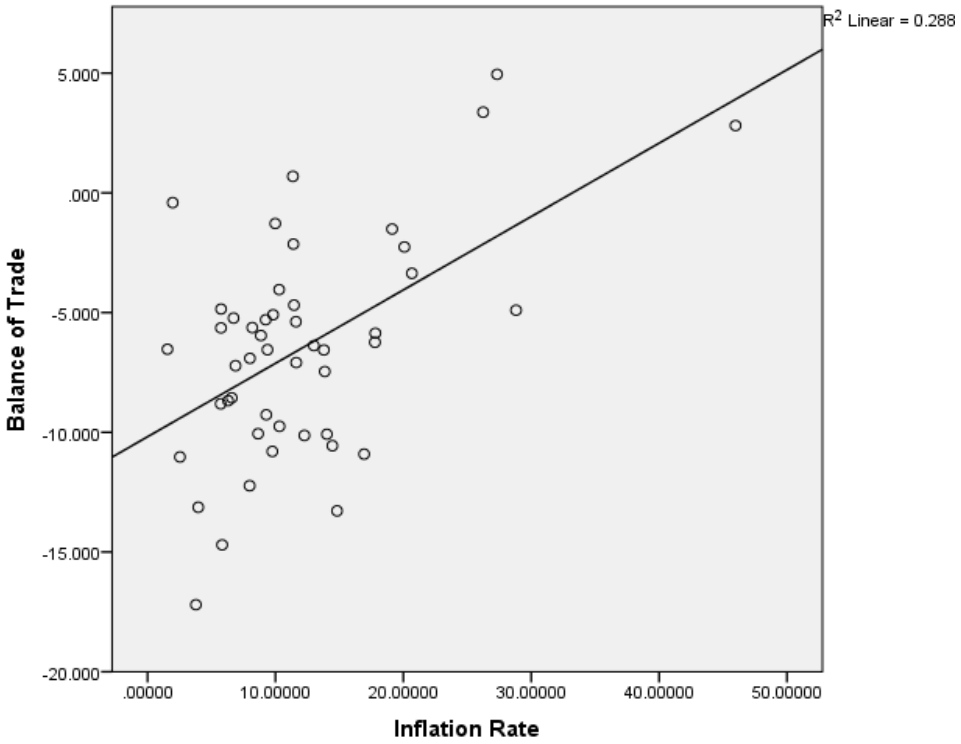

Figure 4. 8: Scatter Plot for Inflation and Balance of Trade

The findings as shown in Figure 4.9, interest rate and balance of trade in Kenya have a linear and positive relationship. Further, the results show that interest rates can explain 21.6% of the balance of trade, measured in terms of import/export ration in Kenya.

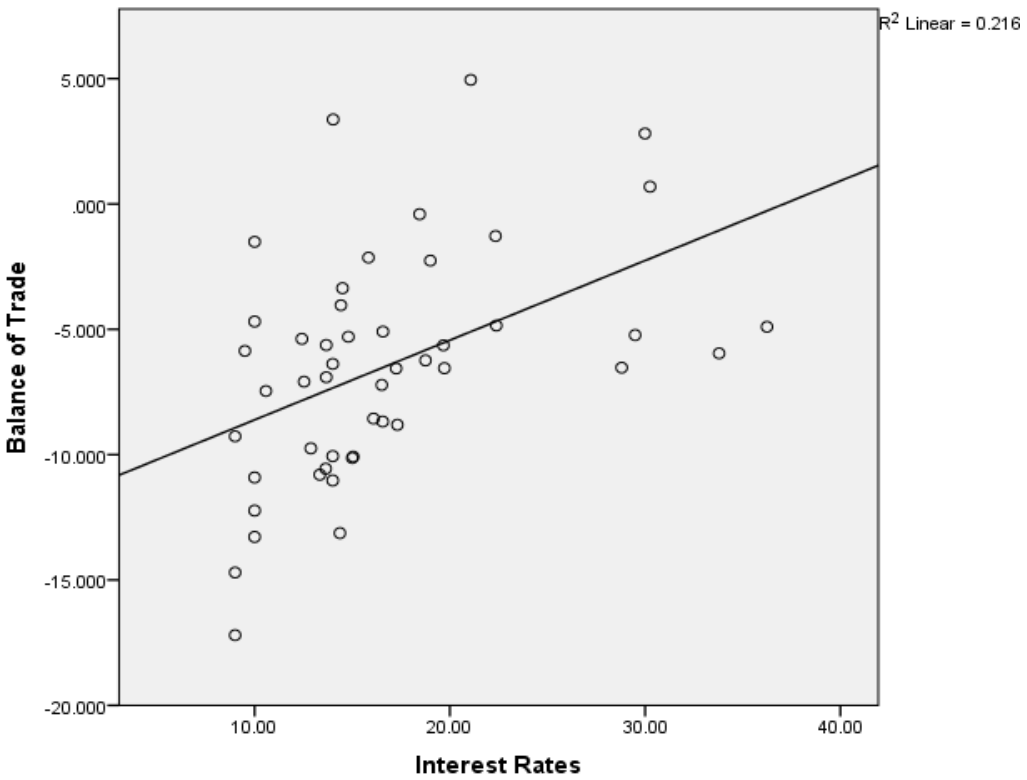

Figure 4. 9: Scatter Plot for Interest Rates and Balance of Trade

4.4.6 Unit Root

The research adopted ADF for testing stationarity of the data. The null hypothesis is that the variables are not stationary or they got unit root and hence if the p-value is less than the significance level (0.05) the variables are stationary. The null hypothesis for the ADF unit root test is that unit root is present in the variables. The p-values for the variables balance of trade, interest rate, inflation and exchange rate were 0.0004, 0.0013, 0.0000 and 0.0000 respectively. This implies that balance of trade, inflation, foreign direct investment and foreign exchange rate had no unit root and hence there was no need of running co-integration. However, interest rate had a unit root as its p-value was 0.4685.

Table 4. 6: Augmented Dickey Fuller unit root test

Variable	No of obs	Test Statistic	p-value for z(t)	Interpooled Dickey-Fuller		
				1% critical value	5% critical value	10% critical value
Balance of trade	48	-4.354	0.0004	-3.600	-2.938	-2.604
Interest rate	48	-1.628	0.4685	-3.600	-2.938	-2.604
Consumer price index	48	-4.027	0.0013	-3.600	-2.938	-2.604
Foreign direct investment	48	-5.797	0.0000	-3.600	-2.938	-2.604
Foreign exchange rate	48	-3.544	0.0000	-3.600	-2.938	-2.604

4.5 Correlation Analysis

Correlation coefficient is one of the techniques that is used to measure the degree of association between two variables. For this test, the degree of association is measured by both the dependent and independent variables. For this test, the degree of association between the variables can either be positive or negative.

The test indicates that, there is a weak association between variables if correlation coefficients range between 0.20 to 0.39. On the other hand, moderate association is present if the coefficients range between 0.40 to 0.59. Further, a strong relationship exists if the coefficients lies between 0.60 to 0.79. A very strong relationship is established if coefficients lies between 0.8 to 1.0.

The current study conducted correlation analysis for both the dependent and independent variables using Pearson product-moment correlation coefficient.

From the findings as shown in Table 4.7, there is a positive and significant relationship between foreign direct investment and balance of trade in Kenya (r = 0.652, p-value=0.000). These findings are contrary to Hailu (2016) findings that FDI elasticity has a significant impact on the balance of trade in Africa. Also, the findings agree with Yaoxing (2017) findings that both FDI and trade openness had a significant influence on balance of trade in Cote d'Ivoire.

Further, the findings indicated that inflation rate had an inverse and significant relationship with balance of trade in Kenya (r = -0.536, p-value=0.000). The findings are contrary to Munir and Kiani (2020) findings that a positive relationship existed between trade balance and inflation in the long run. However, the findings agree with Roslan (2018) findings that inflation has a negative influence on trade balance in Malaysia.

In addition, the results show that there exists an inverse and significant relationship between interest rates and balance of trade in Kenya (r= -0.465, p-value=0.001). The findings agree with Shafi, Hua and Idrees (2019) findings that interest rate had a negative impact on balance of trade in both Pakistan and India. Also, foreign exchange rate had an inverse, but insignificant relationship with the balance of trade in Kenya (r=-0.127, p-value=0.389). These findings agree with Puah *et al.* (2018) argument that there was no relationship exchange rate and balance of trade in Indonesia.

Table 4. 7: Correlations Coefficient

		Balance of Trade	Foreign direct investments	Inflation Rate	Interest Rate	Foreign Exchange Rate
Balance of Trade	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	48				
Foreign direct investments	Pearson Correlation	.652**	1			
	Sig. (2-tailed)	.000				
	N	48	48			
Inflation Rate	Pearson Correlation	-.536**	-.359*	1		
	Sig. (2-tailed)	.000	.012			
	N	48	48	48		
Interest Rate	Pearson Correlation	-.465**	-.385**	.230	1	
	Sig. (2-tailed)	.001	.007	.117		
	N	48	48	48	48	
Foreign Exchange Rate	Pearson Correlation	-.127	-.344*	-.191	.343*	1
	Sig. (2-tailed)	.389	.017	.193	.017	
	N	48	48	48	48	48

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

4.6 Multiple Regression

To establish the effect of macroeconomic variables on balance of trade in Kenya, multiple regression analysis was undertaken where the independent variables included FDI, interest rate, inflation and foreign exchange rate and the dependent variable was balance of trade.

The regression model was expressed as follows;

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \varepsilon_t$$

Y_t is the dependent variable (balance of trade), B_0 is the y intercept (Constant), β_1- β_3 and coefficients of determination, $X_{1t}$is the foreign exchange rate, $X_{2t}$is the interest rate, X_{3t} is inflation,X_{4t} is foreign direct investment, t represents time and ε_t is an error term.

The r-squared for the relationship of the four independent variables (interest rate, FDI, foreign exchange rate and inflation) and the dependent variable (balance of trade in Kenya) was 0.5716. This indicates that the four independent variables (interest rate, FDI, inflation and foreign exchange rate) can help in explaining 57.16% of the balance of trade in Kenya. Moreover, the p-value for the F-statistic was 0.000, which shows that the model can be used in predicting the influence of interest rate, FDI, inflation and foreign exchange rate on balance of trade in Kenya. After adjusting for the errors, the r-squared was 0.5317 implying that 53.17% of the balance of trade in Kenya can be explained factors such as interest rate, FDI, inflation and foreign exchange rate. The results show that the F-calculated (14.34) was greater than the F-critical (2.59) and the p-value (0.000) was less than the significance level (0.05) showing that the model could be used in predicting the effect of the four independent variables on the dependent variable.

The results show that FDI has a positive and significant effect on the balance of trade in Kenyaas indicated by a regression coefficient of 2.89261. The p-value (0.000) was less than the significance level (0.05) and hence the influence was significant. This implies that an increase in FDI would lead to a 2.89261 increase in the balance of trade. These findings agree with Kiran (2017) findings that foreign direct investment has a positive effect on balance of trade in Turkey.

In addition, the results revealed that inflation (CPI) has an inverse and significant effect on the balance of trade in Kenyaas indicated by a regression coefficient of -0.1724934. The p-value (0.014) was less than the significance level (0.05) and hence the effect was significant. This shows that an increase in inflation would lead to a 0.1724934 decrease in the balance of trade in Kenya. The findings agree with Wahu (2016) findings that there was a negative association between inflation and trade balance in Kenya. In addition, the findings concur with Lotfalipour et al. (2018) findings that inflation has an inverse effect on balance of trade among North Africa and Middle East countries.

Further, the results show that interest rate has an inverse and significant effect on the balance of trade in Kenya as shown by a regression coefficient of -0.1591697. The p-value (0.047) was less than the significance level (0.05) and hence the effect was significant. This implies that an increase in interest rates would lead to a 0.1591697 decrease in the balance of trade in Kenya. The findings agree with Gardner and Kimbrough (2017) findings that interest rate had a negative effect on trade balance in the world economy. The findings also concur with Sitima (2018) findings that interest rate had a statistically significant impact on the balance of trade in South Africa.

The results show that foreign exchange ratehas an inverse and insignificant influence on the balance of trade in Kenyaas indicated by a regression coefficient of -0.0077768. The p-value (0.630) was greater than the significance level (0.05) and hence the influence was insignificant. These findings disagree with Akoto (2016) findings that increase in exchange rate decreases the balance of trade of a country while decreasing exchange rate lowers purchasing power of income and capital gains resulting from total returns.

Table 4. 8: Multiple Regression coefficients

Source	SS	df	MS	Number of obs =	48
				F(4, 43) =	14.34
Model	559.463387	4	139.865847	Prob > F =	0.0000
Residual	419.329918	43	9.75185856	R-squared =	0.5716
				Adj R-squared =	0.5317
Total	978.793305	47	20.8253895	Root MSE =	3.1228

BoT	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
FDI	2.89261	.7440532	3.89	0.000	4.393136	1.392084
In	-.1724934	.0670146	-2.57	0.014	-.0373456	-.3076412
IR	-.1591697	.0780075	-2.04	0.047	-.0018525	-.3164869
FX	-.0077768	.0160173	-0.49	0.630	-.0400787	.0245251
_cons	-8.680201	1.955392	-4.44	0.000	-12.62362	-4.736777

V. Summary, Conclusion And Recommendations

5.1 Introduction

The chapter presents the summary, conclusion and recommendations of the study as per the study hypothesis. Specifically, the chapter presents descriptive and inferential findings summary, followed by conclusions, recommendations for policy, and recommendations for practice and suggestions for further studies.

5.2 Summary of the Findings

This section summarizes the study results on the effect of interest rate, foreign direct investment, inflation and foreign exchange rate on economic growth in Kenya.

5.2.1 Foreign Exchange Rate and Balance of Trade

The research findings show that foreign exchange rate has an inverse, but significant effect on the balance of trade in Kenya. This means that an increase in foreign exchange rate leads to a reduction in the balance of trade, although the relationship is insignificant. Normally, increase in exchange rate decreases the balance of trade of a country while decreasing exchange rate lowers purchasing power of income and capital gains resulting from total returns. Investors need to understand the effects of exchange rates and currency value on their investments.

A domestic currency that has appreciated significantly may pose a challenge to the cost-competitiveness of exporters, who may find themselves priced out of export markets. This may pressure a nation's trade balance. Kenya has a current account deficit which means it does little exporting as compared to importing. Exporting and importing have a symbiotic relationship and are all pegged to the exchange rate of the shilling. In an explanation, the country suffers few exports because it produces goods with low prices which saturate the markets but do not fetch enough cash. Cheap exports can be attributed to the higher prices of the imported essential commodities which are required to produce quality and thus expensive goods for export. Relatively cheap products are as a result of avoidance to use the imported items which would add quality to the goods and make them highly competitive in terms of price on the international market.

5.2.2 Interest Rates and Balance of Trade

The study found that interest rates have an inverse and significant effect on the balance of trade in Kenya. This implies that an increase in interest rate leads to a decrease in the balance of trade in Kenya. Globally interest rates can have a combination of positive and negative impacts on global business markets. The rate of interest impacts the economy through influencing recessions, inflation, interest rates of stock and bonds as well as business expenditure. Increase in interest rates makes it had to borrow and hence a reduction in exportation. A country with a rising balance of trade deficit will need progressively low interest rates to attract the foreign capital flows necessary to fund that deficit. The decrease in interest rates could be expected to eventually correct the tendency towards balance of trade deficit by restricting domestic demand and related demand for imports. Sometimes, the cause and effect can be the other way around, that is, with higher interest rates in the first place attracting the foreign capital flows that fund and encourage a tendency towards deficit in the balance of payments.

5.2.3 Foreign Direct Investment and Balance of Trade

The study found that Foreign Direct Investment (FDI)positive and significantly affects the balance of trade in Kenya. This implies that an increase in foreign direct investment leads to an increase in the balance of trade. FDI (capital inflow) enables a particular state to export more than it imports thus enabling it to save extensively, invest than saving, ultimately resulting to rapid accumulation of capital to foster productivity of labor.

Moreover, FDI can lead to absorption of surplus literate manpower in formal and informal sectors. Creation of employment and enhancing productivity through entrepreneurship plays an integral role in poverty alleviation. Besides that, FDI can lead to expertise and technological transfer thus stimulating growth of local firms, thus increasing their export capacity. This occurs through competition, emulation in industrial settings and training. For instance, foreign firms often provide domestic enterprises to input and output markets provided there are favorable importation terms than exportation conditions.

The study findings show that FDI has significant effect on growth of economy, henceforth; the government encourages FDI through implementing strict regulation and rules to prevent micromanagement of foreign investment. It also favors some industrial sectors with targeted subsidies while forestalls other industries through setting legislations. In addition, it is prudent to pay much attention to policies which enhance growth of economy thus attracting FDI. The trends also reveal that the FDIs in some states tend to attract much higher FDIs compared to others. The republic of Kenya has quite low FDI, hence, there is need to improve on entrepreneurship environment through setting administrative procedure, functional judicial and legal system so as to fight against corruption, ensure adherence to the set rules and enable investors to enjoy their property rights. Henceforth, this will enable the country to improve on its FDIs.

5.2.4 Inflation and Balance of Trade

The study established that inflation (consumer price index) has an inverse and significant effect on balance of trade in Kenya. This implies that an increase in inflation (consumer price index) leads to a decrease in the balance of trade in the country. If inflation is running rampant in a country, the price to produce a unit of a product may be higher than the price in a lower-inflation country. This would affect exports, affecting the trade balance.

Inflation can make it difficult to predict profitability of future investment initiatives more so when inflation rate is high, attributing to price variability. This results to adoption of more strategies of investments thus leading to decline in investment as well as exportation. Further, inflation may reduce the competitiveness of a country in international markets by making exportation cost to be relatively expensive consequently affecting balance of payment. Furthermore, inflation can affect taxation system by distorting lending and borrowing decisions. Firms may be subjected to allocate more resources so as to counteract the negative impacts of inflation.

5.3 Conclusion

The study concludes foreign exchange rate has an inverse, but insignificant effect on the balance of trade in Kenya. This implies that increasing foreign exchange rate would not significantly affect the balance of trade in terms of import export ratio. High foreign exchange rate may significantly pose a challenge to the cost-competitiveness of exporters, who may find themselves priced out of export markets.

The study concludes that interest rate has an inverse and significant effect on the balance of trade in Kenya. This implies that an increase in interest rate would lead to a significant decrease in balance of trade in the country. Higher interest rates lead to hot money flows and an appreciation of the exchange rate. This makes exports more expensive and imports cheaper. This tends to worsen the balance of trade.

The study also concludes that foreign direct investment has positive and significant effect on the balance of trade in Kenya. This implies that an increasein foreign direct investment would considerably or significantly increase the balance of trade. The flow of FDI is expected to be able to increase productivity which will ultimately have an impact on the increase in national income in the form of increased exports.

The research further concludes that there is an inverse and significant relationship between inflation and balance of trade in Kenya. This shows that an increase in consumer price index in Kenya leads to a decrease in the balance of trade. If inflation is running rampant in a country, the price to produce a unit of a product may be higher than the price in a lower-inflation country. This would affect exports, affecting the trade balance.

5.5 Recommendations

The study found that an increase in interest rates leads to a decrease in the balance of trade. In the year 2016, Kenya introduced interest rate capping policy but removed it in the year 2019. The study recommends that policy makers including the central bank of Kenya should review policies on interest rates and ensure the lowest possible interest rates are charged so as to support expansion of businesses and hence subsequently increase exportation of goods to other countries.

The study found that FDI has an insignificant effect on the balance of trade. However, monetary and fiscal policies are established to encourage FDI in the country thus resulting to high balance of trade. The key role of policy recommendation is to attract exportation oriented FDI in industrial sector. In addition, the government of Kenya should improve conditions that can make the Kenyan market more attractive to invest in so as to increase exports to other countries. These strategies should include the use of tax subsidy and tax relief and tax holiday. In addition, the government should focus on improving infrastructure including roads, railway, water supply and electricity supply.

The study showed that inflation has a negative effect on the balance of trade. Negative inflation rates discourage investors due to lower rate of return in profits. The study therefore recommends that the

government of Kenya should come up with policies to curb inflation rate to levels that stimulate investment. This study recommends that the government should develop tight fiscal policies to reduce inflation. The study recommends that development of supply side policies to increase long-term competitiveness through privatization and deregulation, which helps in reducing cost of businesses and hence leading to lower inflation. Reducing cost of business will enable more firms to export to other countries, this improving balance of trade.

The study established that foreign exchange rate significantly affects the balance of trade. Monetary and fiscal policies influence the execution of policies related to exchange rate in the developing countries. Given the essence of foreign exchange rate in imports and exports, Kenya should focus on implementing the exchange rate policies that aim at stabilizing the exchange rate. As such, the government of Kenya through the Central bank should seek to develop or improve monetary and fiscal policies so as to ensure the stability of the exchange rate.

5.6 Suggestions for Further Studies

This research was conducted on the effect of macroeconomic factors on the balance of trade in Kenya. However, different countries around the world are characterized by different macroeconomic factors and hence findings from one country cannot be generalized to other nations. Therefore, comparative studies should be conducted on the effect of macroeconomic factors on balance of trade in developing and developed Countries. Furthermore, comparative studies should be conducted on the relationship between macroeconomic factors and economic growth in developing countries like East African region countries. The study found that interest rate, inflation rate, exchange rate and FDI could explain 57.16% of the balance of trade in Kenya. This research therefore suggests further research on other macroeconomic factors that affect the balance of trade in Kenya.

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APPENDICES

Appendix I: Checklist

Year	Foreign Exchange rate (KSH/USD)	Interest Rate (IR)	Inflation (Consumer price index)	Terms of trade (Import/export ratio)	Foreign Direct Investment (Percent of GDP)

Daniel Kabi. "Effect of Macroeconomic Variables on Balance Of Trade in Kenya." *IOSR Journal of Economics and Finance (IOSR-JEF)*, 12(5), 2021, pp. 01-31.