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**REAL INTEREST RATE, INFLATION,
EXCHANGE RATE, COMPETITIVENESS AND
FOREIGN DIRECT INVESTMENT IN KENYA**

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REAL INTEREST RATE, INFLATION, EXCHANGE RATE, COMPETITIVENESS AND FOREIGN DIRECT INVESTMENT IN KENYA

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Abstract

Purpose: The purpose of this study was to establish the effect of real interest rates, exchange rate, inflation and competitiveness on FDI in Kenya.

Methodology: The study used annual time series data for the period 1970-2016. The sources of data included World Bank Indicators and Kenya National Bureau of Statistics annual reports. Data was collected for the variables real interest rates, exchange rates, inflation rate, competitiveness/ease of doing business and FDI. The data for all the variables was in percentage. The study employed ordinary least square regression technique to determine the effect of real interest rate, exchange rate, inflation and competitiveness on FDI in Kenya.

Results: From the findings, the study concluded that real interest rates and exchange rates have negative and significant influence on FDI inflows into Kenya. Further, the study concluded that competitiveness has a positive and significant influence on foreign direct investment inflows into Kenya. However, inflation was found to have insignificant influence on FDI.

Unique Contribution to Policy: There is need for favourable interest rates, desirable exchange rates and liberalization of the economy by undertaking comprehensive programmes to trade reforms, designed to open the economy and increase its competitiveness. The Kenyan government should also encourage freedom of capital transactions with foreigners and competition in domestic market.

Keywords: *Real interest rate, inflation, exchange rate, competitiveness, foreign direct investment*

1.0 INTRODUCTION

1.1 Background of the Study

As indicated by Global Development Finance (2008) and Kenya's Economic Survey (2008), net FDI streams to growing economies increased from US\$ 367 billion in 2006 to US\$ 471 billion in 2007. This represented more than 25 percent of worldwide FDI inflows. Of the net FDI streams to growing economies in 2007, Europe and Central Asia represented 34 percent, while Latin America and the Caribbean and East Asia and Pacific nations represented 23 percent and 25 percent respectively.

In the 1970s and 1980s Kenya was the leading destination of FDI in the East African region. However, as Uganda and Tanzania began to reform their economies to attract foreign investors in the early 1990s, Kenya's regional leadership diminished gradually. FDI flows between 1996 to 2003 averaged US\$ 29 million in Kenya, while in Tanzania and Uganda it averaged US\$280 million and US\$ 220 million respectively. In the mid-1990s Kenya's share of the FDI flows in East Africa was 55 percent but declined to 18 percent by 2003. Tanzania and Uganda had a share of 34 percent and 46 percent respectively by 2003 (Abala, 2014).

In Kenya, FDI has been an integral part of the development process. During Kenya's colonial era under the British monarch, FDI mainly occupied both agricultural and manufacturing sector while after independence FDI became an important factor in its industrialization process (Swainson, 1980). According to United Nations Conference on Trade and Development (UNCTAD) (2010), Kenya is described as East Africa regions' least effective suitor in attracting FDI. Figure 1 shows the trend in FDI over the period 1970-2015 showing fluctuations through-out this period.

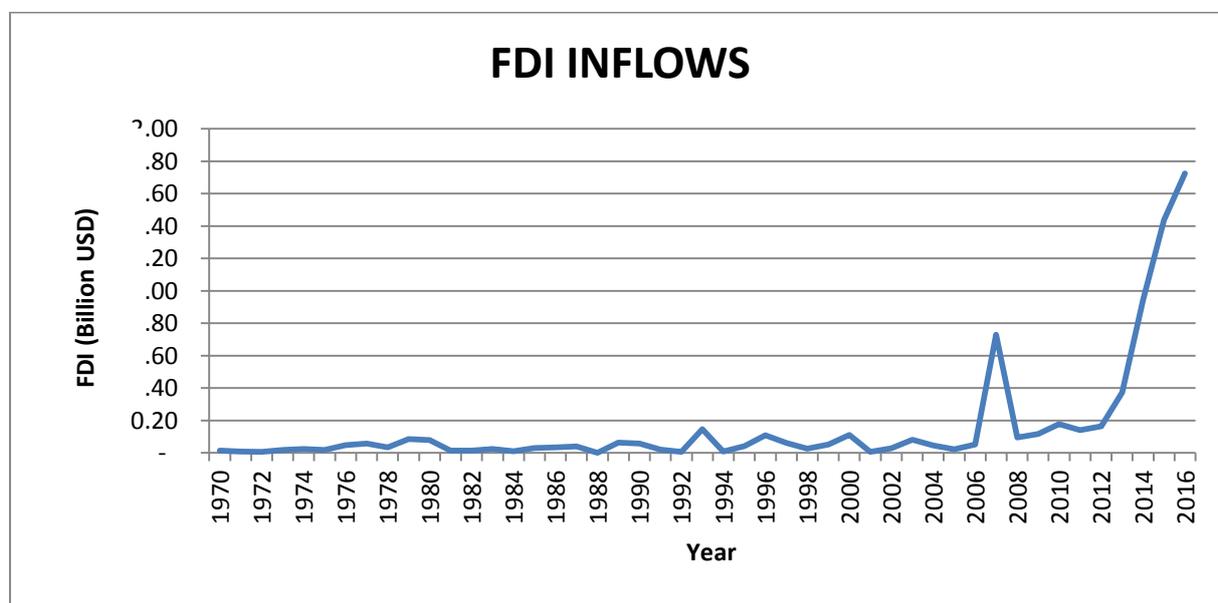


Figure1: Trends in FDI flows in Kenya (1970 – 2016)

Data Source: World Bank development Indicators, 2016

FDI rose from US\$ 14 million in 1970 to US\$ 84 million in 1979 then declined to about US\$ 11 million before rising again to US\$ 62 million in 1989. There was not much change in the level of FDI in the year 1990 despite establishment of the Capital Markets Authority (CMA) which aimed at strengthening the capital market as well as improving its efficiency.

The level of FDI between 1991 and 1992 was low due to suspension of aid from foreign donors. Despite a low of US\$ 2 million in 1992, FDI quickly rose to US\$ 146 million in 1993; the year during which Kenya started a major economic reform program with assistance from International Monetary Fund (IMF) and World Bank. The reform included abolishment of foreign exchange controls, price controls and import licensing which encouraged FDIs into the country (Ocharo *et al.*, 2014). Kenya continued experiencing minimal fluctuations in the level of FDI from 1993 until 2007, despite institutional changes. Some of the changes that occurred during this period include the amendment of the Foreign Investment Protection Act (1964) in 1995; repealing of the exchange control act in 1995; introduction of the Central Depository System (CDS) in 2004 and automation of trading system in 2006.

A notable change in the level of FDI in Kenya was realized in 2007 when it experienced a sharp rise in level of FDI that was due to privatization of Telkom Kenya and introduction of a new mobile phone operator. This led to a liberalized communication sector which attracted foreign investors (Ng'ang'a, 2013).

According to the World Bank report (2014), Kenya received US\$729 million in FDI in 2007 (2.7 percent of GDP) but there was a notable decline in 2008 when it received US\$96 million in FDI (0.3 percent of GDP). This was due to the political unrest experienced during the election period in the late 2007 which led to uncertainties in the economy that discouraged foreign investors. In 2009, Kenya received US\$ 141 million (0.4 percent of GDP) and US\$186 million (0.6 percent of GDP) in 2010 in FDI. In 2011, the level of FDI increased greatly reaching US\$ 335 million. In the period 2012-2015, Kenya experienced a great increase in the value of FDI inflows. This could be attributed to improved political stability. In 2015, FDI inflows to Kenya rose from US\$ 944 million in 2014 to US\$1.437 billion. The change of government in 2013 could also have boosted the foreign investors' confidence to invest in Kenya.

1.2 Statement of the problem

Foreign direct inflow has grown significantly over time. According to the World Bank Economic report of 2014, foreign direct investment in Kenya had increased from as low as 2 million US Dollars in the early 1990's to 944.3 million US Dollars in 2014. The implementation of several institutional changes to strengthen the capital markets and to improve its efficiency among other factors had also catalyzed FDI inflows. These changes included establishment of the CMA in 1990 with amendments of the Foreign Investment Protection Act of 1964 in 1995 making it possible for foreign portfolio investors to buy government securities; repealing of the Exchange Control Act in December 1995 which ensured the removal of all exchange controls; introduction of Central Depository System (CDS) in November 2004 and automation of trading system in September 2006.

Despite FDI inflows into Kenya growing significantly over time and the various policies adopted, studies show that Kenya has lost its competitiveness to other East African countries, that is Tanzania and Uganda. In the 1970s and 1980s Kenya was the leading destination of FDI in the East African region. However, Uganda and Tanzania which started reforms to attract foreign investors in the early 1990s have now taken the lead.

FDI flows between 1996 to 2003 averaged US\$ 29 million in Kenya, while in Tanzania and Uganda it averaged US\$280 million and US\$ 220 million respectively. In the mid-1990s Kenya's share of the FDI flows in East Africa was 55 percent but declined to 18 percent by 2003. Tanzania and Uganda had a share of 34 percent and 46 percent respectively by 2003 (Abala, 2014).

According to Gross and Trevino (2008) a relatively high interest rate in a host country has a positive impact on inward FDI. Chingarande (2012) examined the impact of interest rates on foreign direct investment and found that interest rates cannot be used for the purpose of policy making as they had no significant impact on FDI inflows. A high rate of inflation was found to have a negative effect on attracting inward FDI and it is a significant variable which influences foreign investors who wish to invest in Africa (Hailu, 2010). Wanjiru (2014) studied the impact of inflation volatility and economic growth on foreign direct investment in Kenya and found that there was no relationship between foreign direct investment and inflation.

Ochieng (2013) studied the effect of exchange rate volatility on foreign direct investment and found weak correlation between the two variables. Muthoga (2003) investigated the determinants of foreign direct investment in Kenya and found that there is no significant relationship between FDI and inflation rate. Further, Manyanza (2012) examined the factors that influence FDI flows into Kenya, and found that inflation rate had a negative effect on FDI inflows.

From the analysis of previous researches, the relationship between FDI and Macroeconomic variables is contradictory; mixed results is evident with some results indicating that macroeconomic variables like interest rate have a positive impact on foreign direct investment (Ahmed & Mayowa, 2010), others find that interest rates has no significant impact on FDI inflow (Chingarande, 2012). In addition, Muthoga (2003) found no significant relationship between inflation rate and FDI whereas Manyanza (2012) found that inflation rate had a negative effect on FDI. None of the previous studies examined the effect of competitiveness on FDI inflows into Kenya despite Kenya losing its competitiveness in FDI in East Africa. This study sought to determine the effect of real interest rates, inflation, exchange rate and competitiveness on FDI inflows into Kenya.

1.3 Research objectives

The main objective of this study was to establish the effect of real interest rates, exchange rate, inflation and competitiveness on FDI in the Kenyan economy.

The specific objectives of this study were;

- i. To establish the effect of interest rates on FDI flows into Kenya.
- ii. To determine the effect of exchange rates on FDI flows into Kenya.
- iii. To find out the effect of inflation on FDI flows into Kenya.
- iv. To examine the effect of competitiveness/ease of doing business on FDI flows into Kenya.

2.0 THEORETICAL AND EMPIRICAL REVIEW

2.1 Theoretical Review

2.1.1 Keynesian theory of investment

Keynes and Fisher (1936) contended that speculations are made until the present estimation of expected future incomes at the margin, is equivalent to the opportunity cost of capital. The return on speculation is equal to Keynes' minimal productivity of capital and Fisher's internal rate of return (Baddeley, 2003 & Alchian, 1955).

The theory emphasizes on the importance of interest rates in investment decisions. A fall in the interest rates leads to a decrease in the cost of investment relative to the potential yield. A firm will only invest if the discounted yield exceeds the cost of the project. Keynes however believed that the level of savings did not depend on interest rate but on level of income (Eklund, 2013).

2.1.2 The Purchasing Power parity (PPP) theorem

It is a theory of exchange rate determination developed by Cassel in 1918. The PPP theory, measures the purchasing power of one currency against another after taking into account their exchange rate which is determined by the parity between the purchasing powers of the currencies. The theory is based on the law of one price which stipulates that there being no transportation cost or differential tax in any two markets, identical goods should sell for same price (Suranovic, 2012).

The price level in the two markets ought to be connected through the conversion standard and henceforth the start of relationship between exchange rate and inflation rate differences. In that, when the expansion rate differential between two monetary standards changes, the swapping scale acclimates to compare to the relative obtaining energy of the monetary standards. In the event that the hypothesis holds, at that point buy equality exists between the two monetary standards (Madura, 2007). The theory relates to this study since it explains the exchange rate concept which is one of the predicting variables in this study.

2.1.3 The Two-Gap Model

This model by Chenery and Strout (1966) supports the Harrold-Domar model which states that the rate of economic growth depends on the savings level and capital-output ratio (Cheung, 2013). According to this model, there exist two gaps in the economy; savings-investments gap and import-export or foreign exchange gap. The first gap is between the level of savings in any particular economy and the level of investment that is necessary for growth. This implies that if the level of savings is low, firms and individuals are unable to borrow and invest. The second gap is one between foreign exchange earnings and the amount of imports required in production. This suggests that foreign capital inflows can have a multiplier effect on investment and growth. Capital inflows are thus required to fill this gap on condition that investment incentives are favorable. In addition a shortage of foreign exchange can reduce economic growth by constraining both imports and savings (Kabete, 2008). Most developing countries, Kenya included, suffer from insufficient savings and/or foreign exchange earnings among other factors that hinder growth.

2.1.4 Neoclassical Economic Growth Theory

The neoclassical hypothesis of development depends on the idea of diminishing returns. As per Samuelson (1975), the law of diminishing returns alludes that an expansion in a few data sources with respect to other settled contributions to a given condition of innovation will make add up to yield increment, yet after a point the additional yield coming about because of similar options of additional information sources is probably going to end up plainly less and less.

However, if the two information sources are expanded at a similar rate, there may be steady returns to scale as instead of diminishing returns, where all elements develop in adjust and all economies of extensive scale creation have just been acknowledged (Samuelson, 1975). At the point when economies of scale are being acknowledged, no matter how you look at it, increment in the components of generation will really bring about expanding returns and not diminishing returns (Jon, 2001). If increasing returns to scale dominate in the economy as opposed to diminishing returns then foreign investors should concentrate. The theory relates to this study since it explains the investment concept.

2.1.5 The Flexible Accelerator Model

Chenery and Koyck (1952) developed the flexible accelerator model which is a modification of the simple accelerator model. The theory removed one of the major weaknesses of accelerator theory that capital stock is optimally adjusted without any time lag. The flexible accelerator model shows that the relationship between investment and output need not be fixed but can be affected by other variables like the cost of investment funds, that is, interest rates. The flexible accelerator model shows the variable relationship between the growth rate of output and the level of net investment. This model uses lags in the adjustment process between level of output and capital stock.

$$KE = KE(Y, C, P) \dots \dots \dots 1$$

Where;

KE - Equilibrium capital stock

Y - Output

C - User Cost

P - Price of output

The flexible accelerator model assumes that capital stock depends on all past output levels with weights declining geometrically, which is known as lag investment.

$$K_t = f(Y_t, Y_{t-1}, Y_{t-2}, Y_{t-3}, \dots, Y_{t-n}) \dots \dots \dots 2$$

The main limitation of this model is that, it is ad hoc, for it is purely a mathematical model with no economic basis and the introduction of lagged, independent variable in the model leads to inconsistent results because Y_t is related to Y_{t-1} .

The main strength of the flexible accelerator model is that, it proposes that there are other variables that influence investment apart from output. Some of these variables include real interest rate, foreign exchange rate, inflation and competitiveness. This study was guided by the flexible accelerator model.

2.2 Empirical Review

Ahmed and Mayowa (2010) carried out a study on the determinants and impacts of foreign direct investment in Nigeria from 1970 to 2009. The study utilized the Vector Error Correction Model (VECM) and also the Granger causality techniques to make its conclusions. The study found that macroeconomic variables such as interest rates, exchange rates, inflation and openness of the economy are among the main factors that determine the inflow of FDI into Nigeria.

Chingarande (2012) carried out a study on the impact of interest rates on foreign direct investment in Zimbabwe for the period February 2009 to June 2011. The study found that interest rates cannot be used for policy making as they had no significant impact on FDI inflows and that risk factors are the major determinant of FDI in Zimbabwe.

Luther (2014) conducted a study on the causality analysis of FDI, exchange rate and interest rate volatility in Ghana. The study employed Vector Autoregressive (VAR) model and Granger causality test to reach its conclusions. The study found that interest rate volatility directly affects exchange rate and market attractiveness which in turn affects FDI in the long run. The study also established that stable exchange rate improves FDI inflow and that high FDI inflow improves stability of exchange rate in the country.

Schnabl (2007) investigated the impact of exchange rate volatility on economic growth on small open economies at the European Monetary Unity (EMU) periphery. The study employed a panel data of 41 countries in the EMU periphery from 1994 to 2005. Volatility was captured as a yearly average of monthly percentage exchange rate. The researcher performed both GLS and GMM. The findings revealed that exchange rate volatility has negative impact on economic growth. The study concluded that macroeconomic stability is necessary to maintain the peg since stable exchange rate positively influences economic growth

Ogun, Egwaikhide and Ogunleye (2009) conducted a study on real exchange rate and foreign direct investment in Sub-Saharan Africa. Kenya was included in this study among the other Sub-Saharan countries. The study employed the Granger causality and simultaneous estimation techniques to reach its conclusion while using the time period 1970-2005. The study found that there was a significant relationship between the variables. The causality test also showed that there is a statistical dependence between real exchange rate movements and FDI for few of the countries.

Polodoo (2011) investigated the impact of exchange rate volatility on macroeconomic performance in small island developing states. The study used yearly panel data spanning 1999 to 2010 and compute z-score to measure the exchange rate volatility. Plain panel ordinary least square regression was carried out with robust standard error to correct for heteroscedasticity. The result revealed that exchange rate volatility positively impacts on economic growth. The study presents a methodological gap since it used panel data model while the current data will use time series data model.

Yasmin, Hussain and Chaudhary (2003) conducted a study on factors affecting foreign direct investment in developing countries. The analysis was based on a sample of 15 developing countries with 5 each from upper middle, lower middle and lower income countries. The study used panel data model to make its conclusions. The study found that inflation, current

account among some other noneconomic factors affect FDI significantly in low income countries.

Awan and Zaman (2010) examined the impact of inflation rates on FDI inflows in Pakistan. The study findings revealed that inflation rates caused positive significant effect on FDI inflows in Pakistan. The study presents a geographical gap since it was done in Pakistan.

Wanjiru (2014) investigated the impact of inflation volatility and economic growth on foreign direct investment in Kenya. A linear regression analysis was used on the data to determine the relationship between inflation, GDP and FDI flows. The results suggest that there is no relationship between foreign direct investment and inflation, whereas a negative relationship exists between foreign direct investment and gross domestic product.

Walsh and Yu (2010) in their paper analyses various macroeconomic, developmental, and institutional/qualitative determinants of FDI in a sample of emerging market and developed economies. While FDI flows into the primary sector show little dependence on any of these variables, secondary and tertiary sector investments are affected in different ways by countries' income levels and exchange rate valuation, as well as development indicators such as financial depth and school enrollment, and institutional factors such as judicial independence and labor market flexibility. Finally, the study finds that the effect of these factors often differs between advanced and emerging economies.

Jayasuriya (2011) conducted a study on the effect of doing business rankings on FDI inflows across 84 countries. The study employed unbalanced panel model. The study findings revealed that a better doing business ranking is significantly associated with increased FDI inflows. The study concluded that doing business rankings are an important indicator of an attractive investment climate.

Karau (2014) conducted a study on institutional, governance and economic factors influencing foreign direct investment inflows in East Africa. The study employed an econometric technique for analysis and found that institutional variables such as inflation and rate of return on investments had a significant impact on FDI. Further, the study found that governance variables such as control of corruption, political stability, rule of law and infrastructure also significantly influenced FDI inflows to the East African region.

An investigation by Corcoran and Gillanders (2015), analyzed the impact that regulations have on FDI inflows. The study uses the World Bank's Ease of Doing Business ranking to capture the costs that firms face when operating in a country. Several interesting results emerge. Firstly, the Doing Business rank is highly significant when included in a standard empirical foreign direct investment (FDI) model estimated on data averaged over the period 2004–2009. Secondly, the significance of the overall doing business is driven by the ease of trading across borders component.

3.0 RESEARCH METHODOLOGY

To develop the model, the flexible accelerator model by Chenery and Koyck (1952) shows that the relationship between investment and output need not to be fixed but can be affected by other variables like the cost of investment funds, that is, interest rates. The model uses lags in the adjustment process between level of output and capital stock. The equilibrium capital stock KE is given as a function of output, the user cost and the price of output.

$$KE = KE(Y, C, P) \dots \dots \dots 3$$

Where;

KE is the Equilibrium capital stock

Y is the Output

C is the User cost

P is the Price of output

Having derived an expression for the equilibrium capital stock (equation 3) an investment demand function can be derived from changes in KE. Components of gross investment i_t^g are shown as;

$$i_t^g = K_{t+1} - K_t + \alpha K_t \dots \dots \dots 4$$

Where, i_t^g = gross investment

$K_{t+1} - K_t + \alpha K_t$ = Net investment denoted as i_t^n

αK_t = Replacement investment denoted as i_t^r

Gross investment is the sum of net investment and replacement investment.

$$i_t^g = i_t^n + i_t^r \dots \dots \dots 5$$

Replacement investment is each period's depreciation αK_t of the capital stock. The subscripts will be dropped where not needed.

$$i_t^r = \alpha K \dots \dots \dots 6$$

Where; α is the depreciation rate.

Net investment is that part of gross investment that increases the level of capital stock. In the absence of lags in adjustment process of actual capital stock to desired capital stock, net investment would be;

$$i_t^n = \Delta KE \dots \dots \dots 7$$

KE is taken from equation (3). From equation (7) and equation (5) we can see that net investment depends on changes in equilibrium level of capital stock and replacement investment depends on the level of capital stock. Thus in the long run with no trend in the ratio of user cost of capital to the price level (C/P), because C/P remains fairly constant over time, it is the growth of output or demand, that gives us the level of net investment. This gives us the accelerator principle which is the relationship between change in output and level of net investment. From equation (5) and (7),

$$i_t^g = i_t^n + i_t^r = \Delta KE + \alpha K \dots \dots \dots 8$$

Investment in period t can be expressed as;

$$I_t = K_t - K_{t-1} = \Delta K \dots \dots \dots 9$$

Where;

I_t is the net investment at period t

K_t is the desired capital stock

K_{t-1} is the actual capital stock for previous period

Since the proposition of accelerator theory is that investment is related to output, then equation 9 can be re-written as;

$$I_t = K_t - K_{t-1} = \alpha(Y_t - Y_{t-1}) \dots \dots \dots 10 \text{ Or}$$

$$I_t = \Delta K_t = \alpha \Delta Y_t$$

Net investment is related to ΔY

$$\text{Where, } \Delta Y = \alpha (I^n) \dots \dots \dots 11$$

α - denotes marginal productivity of capital

From the accelerator principle investment is a function of output and interest rates (r).

$$I^n = f(Y, r) \dots \dots \dots 12$$

Net investment is taken to include both foreign direct investment (I_f^n) and domestic investment (I_d^n)

$$I^n = [I_f^n + I_d^n] = f(Y, r) \dots \dots \dots 13$$

Empirical Model

From equation 10 investment in period t is determined by changes in output and capital stock. From equation 13 assuming all investment were from foreign direct investment, the study stipulates a relationship between FDI and its determinants. From economic theory and literature review, FDI is determined by several factors as follows: real interest rates, foreign exchange rate, inflation and competitiveness.

The flexible accelerator model of foreign direct investment inflows in this study is modified version of equation 13.

The modified form of the model is given as;

$$FDI = f(RIR, FER, INF, COM) \dots \dots \dots 14$$

Where:

FDI: Foreign Direct Investment

RIR: Real Interest Rate

FER: Foreign Exchange Rate

INF: Inflation

C: Competitiveness

Tables 1: Definition and Measurement of Variables

Variable	Definition	Measurement
Inflation	A sustained increase in the general price level. It is measured as an annual percentage increase	Consumer prices as an annual percentage
Real Interest Rate	The real interest rate is the growth rate of purchasing power derived from an investment.	Real interest rate as a percentage
Foreign Direct Investment	This is a measure of inward direct investment/ inflows made by foreigner's in the host country	Net inflow, measured as a percentage of GDP
Foreign Exchange Rate	Is the rate at which one currency is exchanged for another. It is the value of one country's currency in terms of another country's currency.	Foreign exchange rate as a percentage
Competitiveness	Refers to the ease of doing business in a given country. In this study, it is the ease of doing business in Kenya.	Volume of trade measured as a percentage of GDP.

4.0 EMPIRICAL RESULTS AND DISCUSSION

The study used annual time series data for the period 1970-2016. The sources of data included World Bank Indicators and Kenya National Bureau of Statistics annual reports. Data was collected for the variables real interest rates (RIR), exchange rates (ER), inflation rate (INF), competitiveness/ease of doing business (COM) and foreign direct investment (FDI). The data for all the variables was in percentage. Table 2 below describes the basic features of the real data for the variables. Descriptive statistics give summaries about the sample and they form a fundamental basis for every quantitative data analysis.

Table 2: Descriptive Statistics

	FDI	RIR	INF	ER	COM
Mean	0.67222	6.5276	11.9883	44.4313	57.4979
Median	0.46747	5.89623	10.2841	51.42	55.9468
Maximum	1.7244	21.0963	45.9789	101.54	74.5734
Minimum	0.000394	-8.0099	1.55433	7.02	37.9292
Std. Dev.	0.63775	7.33395	8.1606	32.818	7.4214
Observations	47	47	47	47	47

From the data presented in Table 2, the mean for FDI as a percentage of GDP over the estimated period was 0.67 percent with a standard deviation of 0.64 percent, and with values ranging from a minimum of 0.000394 percent to a maximum of 1.7244 percent. The mean of the real interest rate over the study period was 6.53 percent with a standard deviation of 7.33

percent, and with minimum and maximum real interest rates of -8.009 percent and 21.1 percent respectively.

The mean of the inflation rate over the study period was 11.99 percent with a standard deviation of 8.161 percent, and with minimum and maximum inflation rates of 1.55 percent and 45.98 percent respectively. The mean of the exchange rate over the study period was 44.43 percent with a standard deviation of 32.82 percent, and with minimum and maximum exchange rates of 7.02 percent and 101.54 percent respectively. The mean of the competitiveness/ease of doing business over the study period was 57.49 percent of GDP with a standard deviation of 7.42 percent, and with minimum and maximum percentages of 37.93 and 74.57 percent respectively.

Most time series data is usually non-stationary in nature, thus, prior to running a regression analysis; unit root tests were conducted using the Augmented Dickey-Fuller (ADF) test to establish whether the variables were stationary or non-stationary. The purpose of this was to avoid spurious regression results being obtained by using non-stationary series.

Table 3: Unit Root Tests at Level

Variable name	ADF test	1% Level	5% Level	10% Level	Comment
FDI	3.224321	-3.581152	2.926622	-2.601424	Non Stationary
RIR	-2.582669	-3.581152	-2.926622	-2.601424	Non Stationary
ER	-1.698557	-3.581152	-2.926622	-2.601424	Non Stationary
INF	-3.651546	-3.584743	-2.928142	-2.602225	Stationary
COM	-2.407243	-3.581152	-2.926622	-2.601424	Non Stationary

Results in Table 3 indicate that all variables except inflation rate were non-stationary (i.e. presence of unit roots) at 1 percent, 5 percent and 10 percent levels of significance. This calls for first differencing of the non-stationary variables.

Table 4 displays the unit root tests after first differencing. The results reveal that all the variables become stationary (unit root disappears) on first differencing.

Table 4: Unit Root Tests at First Difference

Variable name	ADF test	1% Level	5% Level	10% Level	Comment
DFDI	-5.275476	-3.584743	-2.928142	-2.602225	Stationary
DRIR	-8.250540	-3.584743	-2.928142	-2.602225	Stationary
DER	-4.815606	-3.584743	-2.928142	-2.602225	Stationary
DCOM	-6.764597	-3.588509	-2.929734	-2.603064	Stationary

Johansen's procedure was used to determine whether there exists a co integrating vector among the variables. In this study, Johansen test was carried out to investigate whether there

was more than a single cointegration relationship between foreign direct investment and its determinants. The results of variables are reported in Table 5.

Table 5: Johansen Cointegration Test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.726045	146.7394	69.81889	0.0000
At most 1 *	0.668070	92.35824	47.85613	0.0000
At most 2 *	0.491308	46.03931	29.79707	0.0003
At most 3 *	0.290326	17.65096	15.49471	0.0233
At most 4	0.074398	3.247053	3.841466	0.0715

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

The results above show the existence of cointegrating relationship between foreign direct investments, real interest rates, exchange rates, inflation and competitiveness. The trace test indicated four cointegrating equations at 5 percent level of significance.

Results in table 6, show the causality test between foreign direct investment and all its determinants. A p-value less than 0.05, led to the rejection of the null hypothesis, while a p value greater than 0.05, led to the non-rejection of the null hypothesis.

Table 6: Causality Test

Causality Test			
Null Hypothesis:	Obs	F-Statistic	Prob
Exchange Rate does not Granger Cause FDI	45	0.18116	0.0486
FDI does not Granger Cause Exchange Rates		0.15191	0.8596
Real Interest Rate Does not Granger Cause FDI	45	0.34046	0.0135
FDI does not Granger Cause Real Interest Rate		0.07537	0.9275
Inflation does not Granger Cause FDI	45	0.95377	0.3939
FDI does Not Granger Cause Inflation		0.86570	0.4285
Competitiveness Does Not Granger Cause FDI	45	9.68506	0.0004
FDI Does Not Granger Cause Competitiveness		5.36177	0.0086

The results reveal that there is causality from exchange rate to FDI; however, there is no causality from FDI to exchange rate. Results also reveal that there is causality from real interest rate to FDI; however, there is no causality from FDI to real interest rate. Further, results reveal that there is no causality from inflation to FDI and from FDI to inflation. Lastly, results reveal that there is causality from competitiveness to FDI and from FDI to competitiveness.

Table 7 below presents the results of the correlation analysis.

Table 7: Correlation matrix

Correlation Probability	FDI	RIR	ER	INF	COM
FDI	1.000000				
RIR	-0.301012	1.000000			
	0.0398	-----			
ER	-0.754203	0.696565	1.000000		
	0.0000	0.0000	-----		
INF	-0.405676	0.723025	0.630310	1.000000	
	0.0047	0.0000	0.0000	-----	
COM	0.614655	-0.466374	-0.733841	-0.450772	1.000000
	0.0000	0.0010	0.0000	0.0015	-----

The results revealed that real interest rates and FDI are negatively and significantly associated ($r=-0.3010$, $p=0.0398$). The results also revealed that exchange rate and FDI are negatively and significantly associated ($r=-0.7542$, $p=0.000$). In addition, the results revealed that inflation and FDI are negatively and significantly associated ($r=-0.4057$, $p=0.0047$).

Finally, results revealed that competitiveness and FDI are positively and significantly associated ($r=0.6147$, $p=0.000$). The results implied that real exchange rate, exchange rate, inflation and FDI change in opposite direction. Further, the results implied that competitiveness/ease of doing business and FDI change in the same direction.

This section presents the results of the regression model specified in equation 3.12. The empirical estimation was based on ordinary least squares (OLS) technique. Time series data was used for the entire period and the results of the estimated model are reported in Table 8.

Table 8: Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REAL INTEREST RATE	-0.056885	0.016455	-3.456995	0.0013
EXCHANGE RATES	-0.018621	0.003157	-5.897287	0.0000
INFLATION	-0.009263	0.010264	-0.902510	0.3719
COMPETITIVENESS	0.07531	0.011142	6.75911	0.04028
C	0.717437	0.727616	0.986011	0.3298
R-squared	0.676651			
Adjusted R-squared	0.645856			
F-statistic	21.97266			
Prob	0.000000			

The study employed an error correction model because some variables were stationary at levels and other variables were stationary after first difference. Differencing variables that were not stationary then applying regression technique only gave short term effects and there were no long term effects. Estimating the equation at levels gives the long term effects and the problem with this method would be that we will not get the short term effects and the speed of adjustment.

The error correction model combines these two and gives both the short term and long term effects. The coefficient of the error term gives the speed of adjustment of the model.

The regression results indicate a coefficient of determination (R squared) of 0.676651 and an adjusted R² of 0.645856. This means that 68 percent of total variations in FDI inflows to Kenya are explained by changes in real interest rates, exchange rate, inflation and competitiveness. The F-statistic of 21.97266 with a p value of 0.000 at 5 percent significance level reveals that all the independent variables were jointly significant in predicting foreign direct investment inflows to Kenya.

5.0 CONCLUSION AND POLICY IMPLICATIONS

5.1 Conclusion

The study concluded that real interest rates and exchange rates have negative and significant influence on foreign direct investment inflows to Kenya. Further, the study concluded that competitiveness (ease of doing business) has a positive and significant influence on foreign direct investment inflows to Kenya. However, inflation was found to be insignificant. Based on the results the most significant factor affecting FDI inflows was competitiveness, followed by interest rates and then exchange rate.

5.2 Policy Recommendations

The Central Bank of Kenya should ensure that the domestic interest rates are favorable to foreign investors. With favorable interest rates, foreign investors will be willing to make more investment in the domestic market and hence lead to increase in FDI inflows to Kenya.

The Central Bank of Kenya should strive to maintain desirable exchange rates. The government should seek to stabilize exchange rates, through adoption of sound fiscal and monetary policies. This will also stimulate wider participation by private sector in economic growth and increase in FDI.

Ease of doing business/ competitiveness is a major determinant of FDI. The government policy should focus on liberalizing the economy by undertaking comprehensive programme to trade reforms, designed to open the economy and increase its competitiveness. The government should also encourage freedom of capital transactions with foreigners and competition in domestic market.

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