

The Impact of Foreign Direct Investment (FDI) on Economic growth in Kenya

NG'ANG'A, Wilson Kamau

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Declaration

This research paper is my original work and has never been presented for a degree award in any other university.

Ng'ang'a, Wilson Kamau

.....

.....

Student name

Date

Signature

Approval

This research paper has been submitted for examination with our approval as university supervisors

Signature:

Date:

Dr. Mbithi Mary Lucia

School of Economics

University of Nairobi

Signature:

Date:

Mr. Awiti L. Maurice

School of Economics

University of Nairobi

Dedication

I dedicate this research paper to my best friend and wife Terry Njoki, my lovely daughters; Ann and Trizah who have inspired and tolerated me in the entire study period. I pray and believe that my God will reward your patience and encouragement you extended to me.

Above all; may the Glory be to almighty God.

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Abstract

This paper examines the effects of FDI flows on Kenyan economic growth over the period 1985-2011. The analysis applies ordinary least square (OLS) regressions technique with net FDI inflows as the main variables of interest. The study finds that FDI impacts positively on Kenyan economic growth although insignificantly with suggested thresholds in literature: trade openness and human capital stock reducing its potential benefit to economic growth in Kenya. Based on these findings, the study suggests that Kenya should embark on policies that promote sound macroeconomic policies to: increase and diversify exports; to provide avenues of utilising the idle or unproductive labour and; to reduce the cost of capital. In addition, the study recommends further research on: whether the source of FDI matters and; the effects of incentives offered so as to capture all the dynamics associated with FDI and economic growth in Kenya.

Keywords: Foreign direct investment, Economic growth, Kenya

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

Foreign direct investment (hereafter FDI) is defined by UNCTAD (1999) as ‘an investment involving a long term relationship and reflecting a lasting interest and control of resident entity in one economy in an enterprise resident in an economy other than that of the foreign direct investor’. According to Mwega (2009), FDI includes: equity capital; reinvested earnings and; intra-company loans, with the first two dominating net FDI to Kenya.

The terms ‘long-term’, ‘control’ and, ‘controlling interest’ differentiate FDI from portfolio investment. According to World Bank, (2010), Portfolio investment represents passive holdings of securities such as bonds, foreign stocks, or other financial assets and does not convey significant control over the management or operations of the foreign firm.

The role of FDI in stimulating economic growth is one of the controversial issues in development literature to date. Whereas the complementary hypothesis argue in favour of FDI suggesting it helps in crowding in domestic investment, the dependency hypothesis argued it’s a new form of dependency, and crowds out domestic savings by allowing domestic residents to increase their consumption of goods and services at the expense of further investment.

Consequently, Chantal, *et al.*, (2005) suggests in the 1970s and 1980s several countries in the region imposed trade restrictions and capital controls aimed at protecting domestic industries and conserving scarce foreign exchange reserves. Moss, *et al.*, (2004) concludes that much of this African scepticism toward foreign investment is rooted in history, ideology, and the politics of

the post-independence period; hence policymakers were not convinced that the potential benefits of FDI could be fully realized in the region.

These inward oriented policies, led to some instances of mass expropriation arising from a shift in political-economic ideology. For example; Monika (2002) suggests that over the period 1960 to 1976 there were at least 1535 cases in 76 less developed countries in which foreign firms were forced to divest. The book value of these firms represented 4.4% of the total stock of FDI in the expropriating countries at the end of 1976.

Hence, until late 1980s, FDI was not fully embraced by African leaders as an essential feature of economic development, reflecting largely fears that it could lead to the loss of political sovereignty, push domestic firms into bankruptcy, and if entry is predominantly in the natural resource sector, accelerate the pace of environmental degradation (Monika, 2002).

There is substantial evidence that this inward-looking development strategy discouraged foreign investment and had deleterious effects on Kenyan economic growth. For example: Kenya GDP annual growth in percentage averaged slightly above 2 percent over the period 1990-2010; while in the same period, both domestic and external debt burden has been on rise.

Despite adoption of inward looking strategy by African countries, Kenya had the most open regimes for FDI in Africa. Since independence, foreign investors did not require screening for approval until 2004 when the Investment Promotion Act (IPA) was adopted. The act introduced requirements amongst them that the investment must create jobs, generate revenues (tax) and bring new technology into the country.

With huge development gaps and low domestic savings, Kenya requires increased foreign investments inflows to improve her resource gap. Theory suggests that if a host country creates an environment conducive to investment, FDI can play an important role in its development efforts. However, the detailed requirements of the IPA are set to become a significant impediment to FDI inflows.

1.1.1 Types of FDI in Kenya

In theory, FDI has been classified in various ways; however, for the purpose of this study we shall apply the trade related classification of FDI. Thus, FDI is classified into three main categories: import oriented FDI; export oriented FDI and; government oriented FDI.

The import oriented FDI aims at substituting what the economy imports by establishing their base in the host economy. In Kenya, the assembling industry can be identified as best example of this type of FDI. However, it is determined by the size of the host market, transportation cost and barriers to trade. The export oriented FDI is motivated by desire to seek cheap factors of production which may be available in the host nation.

Of much interest is the Government initiated FDI which is triggered when government offers incentives to foreign investors. The incentives have seen a rise in foreign firms in Kenyan Export Processing Zones (EPZs), for example; the adoption of EPZs in 1990 attracted more of FDI. In 2003, EPZ accounted for the majority of operating enterprises with 71 percent of the total FDI while joint ventures between Kenyans and foreigners accounted for 16 percent (UNCTAD, 2006). Creation of Special Economic Zones like Konza and TATU cities will continue to trigger inflow of this type of FDI

In terms of linkages, FDI flows into; communication, construction, wholesale trade, and the transport sectors has the highest level of backward linkages in the economy while FDI flows into manufacturing, transport, communication, and financial services have the highest level of forward linkages. However, most of FDI flows into Kenya are in primary sector which has the lowest level of backward linkage as the sector is less integrated with other sectors in relation to the purchase of its key inputs. Hence, there is need for Kenya to ensure she attracts FDI flows that will provide backward linkages to enhance overall economic growth.

1.1.2 Role of FDI in the Economy

Modern theory of FDI suggests that access to FDI flows supplements domestic savings which is low in most developing countries Kenya inclusive. However, FDI can influence the economy through other channels such as: transfer of new technologies and know-how; increased employment opportunities with better content in skills and remuneration; increased competition in the economy leading to high quality goods and services at competitive prices as well as opening up of world markets.

Nevertheless, Kenya lacks sector specific data that can be used for empirical estimation to analyse if the economy do harness benefits that may be accrued from FDI. This data includes; flow of FDI to specific sectors, actual employment generated by foreign firms, actual exports and sales generated by these firms, total revenues generated in form of taxes, tax burden, and number of domestic firms that were crowded out due to liberalisation of the economy.

However, the Kenya Export Processing Zone Authority (EPZA) has detailed data on activities in the EPZs. For example: Table 1 below shows contribution of EPZ to the national economy where 50 percent of firms are foreign owned, 24.4 percent joint ventures and 25.6 percent are solely

owned by Kenyans (Kenya Economic Survey, 2013). From Table 1 below, we can conclude that over the last five years, an increase in investment in EPZs leads to increased sales, exports, employment and backward linkages between domestic and foreign firms.

Table 1: EPZ contribution to the national economy: 2008-2012

Indicators	2008	2009	2010	2011	2012
Investment (Ksh Millions)	21,701	21,507	23,563	26,468	38,535
Total sales (Ksh Millions)	31,262	26,798	32,348	42,445	44,273
Imports by EPZ firms (Ksh Millions)	16,348	12,672	16,518	21,443	24,973
Expenditure on local purchases (Ksh Millions)	11,365	11,032	13,287	14,921	18,097
EPZ exports (Ksh Millions)	31,262	26,798	32,348	42,445	44,273
Kenyans employed in EPZs	30,262	30,115	31,026	32,043	35,501
Contribution of EPZ to GDP constant prices (%)	8.14	6.94	7.08	7.64	7.72
Contribution of EPZ to total Kenyan exports (%)	4.36	3.63	3.76	4.21	4.25
Contribution of EPZ to total national employment (%)	0.29	1.92	2.20	2.76	2.75

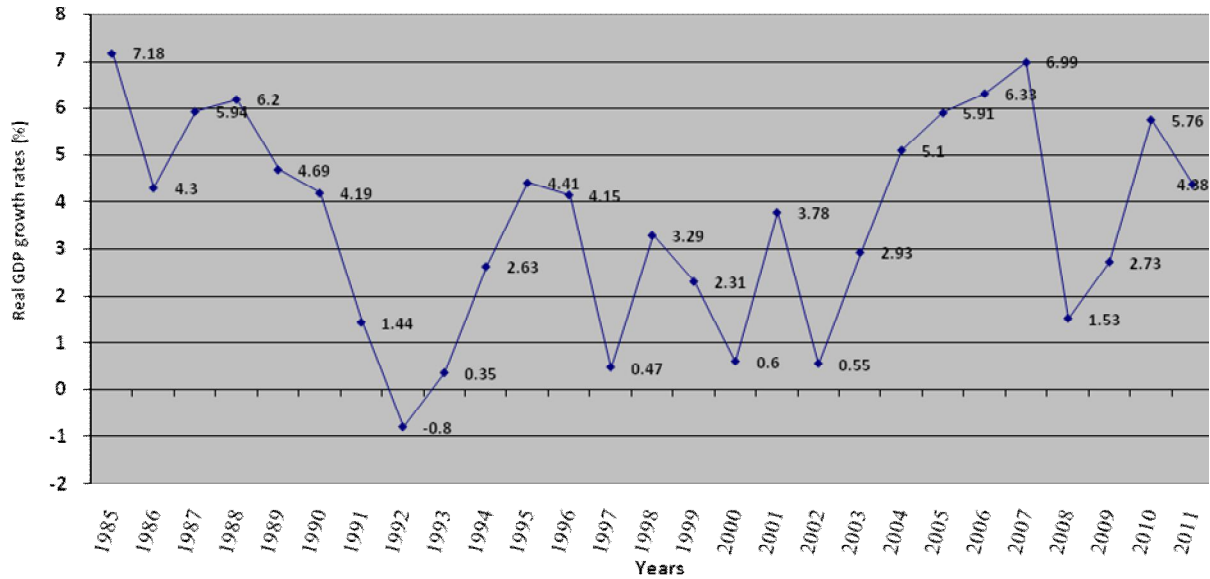
Source: Economic survey 2013 and various EPZA reports

1.1.3 Economic growth Trends in Kenya

Over the period 1985-2010, the performance of the Kenyan economy has been mixed over time as shown in Figure 1 below. The figure shows various GDP growth trends: a) a period of declining growth rates from the 1985 up to 2002; b) a period of growth from 2002 to 2007; c) a sudden fall in 2008 and 2009 partly due to both internal and external shocks and; d) signs of recovery in 2010 with a slight drop in 2011.

The trends depicted in Figure 1 shows that Kenya has not been able to attain and sustain high economic growth rate. The improved growth performance of the economy, particularly between 2003 and 2007, is a result of adoption of sound macroeconomic policies in the country.

Figure 1: Trends in annual Real GDP growth rates (%) over the period 1985-2011



Source: World Bank, 2013

Even though the Kenyan economy experienced growth in 2010, it was below the year's growth target of 10 per cent (Republic of Kenya, 2011). If past trend in economic performance is anything to go by, then a target growth rate of 10 percent is over-optimistic and there is need to diversify the economy through enactment of sound macro and microeconomic policies.

1.1.4 FDI Trends in Kenya

According to UNCTAD (2006) FDI in Kenya grew steadily from 1970s due to its relative high level of development, improved infrastructure, larger market size, economic growth and openness to foreign direct investment. FDI started at a low of around \$10 million a year in the early 1970s before peaking at \$80 million in 1979-80.

The investment wave of the 1980s dwindled in the 1990s as the institutions that had protected both the economy and the body politic from arbitrary interventions were eroded (Phillips et al.,

2001). In this period, Kenya was faced by loss of donor confidence, macroeconomic and political instabilities.

Despite economic reforms and the progress made in improving the business environment, the relative level of FDI inflows into Kenya has never been high by developing countries standards: over 1997–2001, net FDI was about 0.6% of GDP, well below the African average of 1.9%; and by 2003 it was only 7.5 percent of GDP compared with 25.3 percent for Africa as a whole and 31.5 percent for developing countries (UNCTAD, 2006).

On gross capital formation (GFC), Kenya lags behind in terms of FDI contribution to GCF. The share of net FDI in GCF declined from 2.02% in the 1980s to 1.13% in the 1990s (Mwega, 2009). Over the period 2000-2010, it increased to 3.08% and averaged 3.2% over the period 1985-2011.

In addition, over the period 2006-2010, there have been increased capital outflows through acquisition of assets abroad by residents and the global financial crisis experienced from 2008 to early 2010 as shown in Table 2 below. For example, the closing of pay television (G-tv) operations in Kenya was attributed to global crisis.

Table 2: Kenyan outward FDI by type over the period 2006-2010 (Million US \$)

Year/Type	2006	2007	2008	2009	2010
Stock	163	199	243	289	306
Flows	24	36	44	46	18

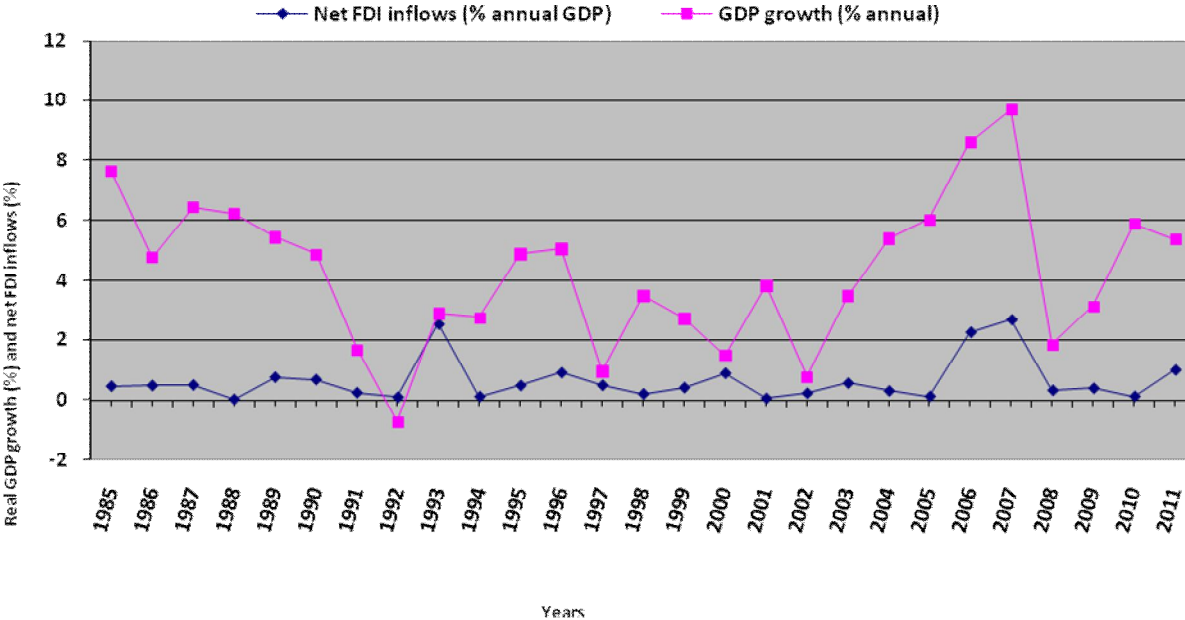
Source: UNCTAD, Kenya IPR Report, 2013

At sector level, Kenya lacks data on FDI inflows, while over 200 MNCs have been identified as having operations in the country (UNCTAD, 2006). Across the study period, net FDI inflows

averaged 0.57% of GDP in 1985-2011. However, there has been good performance of FDI over 2001-2011 with net FDI averaging 0.74% of GDP.

A comparison of trends in net FDI inflows with economic growth trends in Figure 2 below shows growth in real GDP and upsurge of FDI inflows in the years 1993 and 2007; the growth in FDI inflows is attributed to removal of capital controls in 1993 and in 2007 it was due to entry of a third mobile phone operator and privatization of Telkom Kenya.

Figure 2: Comparison in trends; annual Real GDP growth rates (%) and net FDI inflows in Kenya 1985-2011



Source: World Bank, 2013

Figure 2 above shows trend in annual real GDP growth rates does not precisely follow trends in FDI inflows of the previous year.

1.2 Statement of the Problem

Numerous growth models establish a strong link between investments and economic growth. However, most studies on the impact of FDI on economic growth differ: on one hand we've schools of thought that argue it crowds out investment; on other hand we've schools of thought that argue it crowds in investment, improves technology transfer, creates employment, and leads to capital accumulation that may improve long run economic growth.

Despite these literature findings, majority of less developed economies Kenya inclusive continue to provide and improve policy incentives to attract more of foreign investment. If the rationale of giving incentives is to attract more FDI, does the benefits accrued from FDI positively and significantly impact on economic growth of Kenya?

Thus; this paper seeks to investigate the following questions; how important is FDI to economic growth in Kenya, and if foreign investment complements growth, is that true with the case of Kenya? It is against this background that this study analyzes the impact of FDI on the economic growth in Kenya for the period 1985-2011 making use of annual time series data.

1.3 Objective of the study

Main purpose of the study is to empirically ascertain the impact of FDI inflows on economic growth in Kenya.

1.3.1 Specific objectives

The study seeks to:

- i. Analyse trends in FDI inflows and economic growth in Kenya;
- ii. Investigate whether the potential FDI-induced growth in Kenya depends on the level of human capital stock and trade openness as hypothesized in literature;
- iii. Empirically estimate the impact of net aggregate FDI inflows on economic growth in Kenya.

1.4 Significance of the study

The study on the impact of FDI on Kenyan economic growth has important policy implications: if FDI does exert positive impact on economic growth, policies aimed at increasing FDI inflows into Kenya should be encouraged and: if however, it does exert negative impact on economic growth, then this would suggest a reconsideration of such policies adopted to attract FDI.

Moreover, the increasing policy incentives being attached to it, the collapse of domestic industries due to liberalization, lack of consensus on its impact on economic growth, and few of Kenya specific studies with special interest in conditionalities give credence to this study as it will address the Kenya's specific dimension to the FDI growth debate.

The research findings will: help guide policy makers in Kenya on best applicable policies on foreign investment; will add to literature on foreign investment in Kenya and; it will help provide areas for further research to academicians and research bodies.

1.5 Hypothesis of the study

The study assumes that: FDI inflows have an effect on Kenyan economic growth. This will be tested against the null hypothesis that FDI inflows do not have an effect on economic growth in Kenya.

1.6 Organization of the rest of the paper

Following this introduction is: Chapter 2 which provides brief review on past studies done on this area; Chapter 3 provides a theoretical framework and research methodologies; Chapter 4 provides detailed data analysis on the variables of interest and; Chapter 5 which provides conclusion where findings, policy implication and future research areas will be discussed

CHAPTER TWO

2.0 LITERATURE REVIEW

This section gives brief review to the body of economic literature that has explored the effect of FDI on growth at a macroeconomic level.

2.1 Theoretical literature

Theoretical literature largely links the impact of FDI on economic growth through various channels such as; technology transfers, investment and increased output. However, to capture the true insight of the place of FDI in Kenyan's economic performance, the study analyse some of the theories associated with foreign investment.

The Capital Arbitrage Theory linked to international trade postulates that prospective foreign investors move their capital resources in response to changes in rates of returns on investment. By this, capital is expected to flow from a capital surplus to a capital deficit country in response to a higher productivity of capital until the rates of returns are equalized. This theory also sees the existence of FDI from the ground that investing enterprise has management skill or technological advantage, which it can exploit in the foreign economies.

The Theory of the Firm assumes perfect market conditions and also postulates that transactional corporations invest abroad when their investments at home have reached an optimal level and hence any further investments are likely to suffer from diminishing returns to scale. Here, it is expected that the desire to add to the existing plants would expand output as long as there exist a profitable future market for the products. Therefore, FDI is a function of market factors and marginal efficiency of capital.

Next is the Product Cycle hypothesis developed by Raymond and Vernon (1966) argues that companies invest in order to gain access to cheaper factors of production such as low cost of labour. These forms of investment are normally Government initiated. If the government is pursuing export oriented strategy, it gives incentives such as grants and tax concessions to attract the foreign firms, if however, it is pursuing import strategy, foreign firms may be allowed to operate in host economy if it posses unique technical managerial skills.

Fourth, is the External Capital Requirement theory; this theory argues that the extent to which FDI can be substituted for other forms of capital inflow differs amongst countries. It further explains that countries with small internal market, poorly developed infrastructure and limited export potentials may have difficult in best FDI in substantial magnitude into their economy irrespective of any existing incentive scheme.

The classical theory developed by Robert Solow (1956) has two terms; the first displays capital increment which represents actual investment per labour unit while the second term displays the increase in labour which can be interpreted as representing the break-even investment necessary to keep capital at its existing level. Using this theory, therefore, an increase in foreign capital stock in Kenya will lead to higher growth in output. However, due to diminishing returns to capital, any increase in the stock of foreign capital cannot be sustained in long run which implies that within the neoclassical model, foreign capital impacts growth in short term

The neoclassical accelerator investment model has gained more popularity among development economists. This theory suggests that investment occurs to enlarge the stock of capital and hence more output is produced. Thus, foreign investment is encouraged by host nations to correct any

discrepancy between desired capital stock and actual capital stock. However, this model is of little relevance to Kenya due its underlying assumptions of perfect markets.

The eclectic paradigm hypothesis postulated by Dunning (2001) suggests labour productivity could be transferred across nations in form of FDI. It further asserts that the extent and pattern of international production financed by FDI and undertaken by MNEs depends on: a) The competitive advantages among nations; b) The extent to which firms perceive competitive advantage to internalize the markets in adding value to production; c) The extent to which firms choose to locate these value-adding activities outside their national boundaries.

Most developing countries experience shortage of capital; this is reflected in respective savings-investment and import-export gaps normally referred to as two-gap models. This implies developing countries have insufficient savings and/or foreign exchange to finance their investment needs. As such, this model can be used in Kenya to establish the level of foreign investments necessary to drive certain levels of expansion.

Recent example of two gap model is the World Bank Revised Minimum Standard Model (WMRMSM) which is used to determine the correct amount of savings necessary to maintain the increment in output as a result of external financing. It advocates for incremental in exports so as to maintain increased savings. The external financing used in deriving the required savings can be acquired through attraction of more FDI in domestic economy as foreign aid has proven to be detrimental.

2.2 Empirical literature review

Due to the fact that few empirical studies have focused on Kenya, the study highlights some of the typical studies exploring the FDI-growth nexus. The review groups the empirical literature in three categories as follows:

2.2.1 Global studies on the relations between FDI and economic growth

Studies on global aspect of FDI and economic growth are varied and lacks consensus. Most of these studies suggest that FDI potential effect on the economy depends on the host economy macroeconomic conditions.

The importance of income threshold is explained by Blomstorm, *et al.*, (1992). They applied ordinary least squares (OLS) technique to examine the influence of FDI on growth. Using data from 78 developing countries over the period 1960-1985, they did regression analysis with real GDP per capita growth as dependent on FDI and other variables such as imports, education investment, price and labour participation rate. They found that inflows of FDI have significant effect on growth in higher income developing countries, suggesting that countries have to pass a minimum income threshold in order to benefit from FDI.

On human capital stock, Borenzstein, *et al.*, (1995) applied three-stage least squares (3SLS) technique on panel data from 69 developing countries over the period 1970-1989 to; empirically analyze the impact of FDI on economic growth, examine whether FDI interacts with stock of human capital to affect growth rates and test whether level of FDI has effect on the overall level of investment in the country and on efficiency of investment. They formulated a growth model which included FDI among the determinants of initial GDP per capita. They found that FDI has a

positive overall effect on economic growth, although the degree of such effects depends on the stock of human capital available in the host economy.

The openness of the trade regime and its influence on FDI's impact on growth is highlighted by Balasubramanyan, *et al.*, (1996). They applied OLS and Generalised Least Square Estimates (GLS) to empirically examine the role FDI plays in economic growth in export promoting countries. Using cross-section data from 46 developing countries over period 1970-1985, they found that FDI had positive impact on all sampled countries. However, FDI had more impact on economic growth in export-promoting than import-substituting countries. They also found that it is FDI that acts as a driving force in economic growth process and not domestic investment in export oriented countries.

On degree of development, De Mello (1999) applied instrumental variable (IV) technique on data from 15 OECD and 17 non-OECD countries from 1970-1990 to ascertain the impact of FDI on output, capital accumulation, and total factor productivity. Using panel and time series data, de Mello regressed output on; a vector of variables, FDI and individual country time-invariant effect. De Mello found that the long run effect of FDI on growth is heterogeneous across countries; there is generally weak effect of FDI on economic growth which is positive for OECD but negative for non-OECD. He also found FDI has positive effects on capital accumulation lending support to some degree of substitutability hypotheses between FDI and domestic investment.

However, a number of studies argue that FDI potential impact on the economy does not depend on host economic conditions such as; level of development, trade openness, stock of human capital and, income levels.

A study by Carkovic and Levine (2002) applied Generalized Methods of Moments analysis to estimate effects of FDI inflows on economic growth using data from 72 countries over the period 1960-1995. They also examined whether the growth effects of FDI depend on the host country's investment conditions such human capital stock, financial deepening and level of economy openness. They did a regression analysis of real per capita GDP growth on; gross private capital inflows (FDI) and a vector of conditioning information. They found that FDI shows marginal macroeconomic impacts on economic growth, and found no evidence that FDI depends on certain level of human capital stock, economic development, and trade openness to positively impact on the economy. In fact, their results showed FDI is growth enhancing in countries with low education attainment.

2.2.2 Regional studies on the relations between FDI and growth in Africa

These are studies done on some of the African countries with mixed results realised as in the global aspect of FDI on growth. Obwona (1999) applied two stages least squares (2SLS) technique to establish the relationship between FDI and GDP growth in Uganda from 1981-1995, The study builds a two equations model for the FDI determinants and growth equations. In the growth equation, annual growth rate of GDP is regressed on; FDI, gross domestic savings as a proportion of GDP, rate of growth of real exports, foreign aid, and other capital inflows. Obwona found that the impact of FDI on growth is positive though insignificant. However, he concurred with other studies that FDI had more impact in the export oriented countries.

Adeolu (2007) applied two stage least squares and OLS to empirical examine the impact of FDI on Nigeria's economic growth both at macro and micro level. Adeolu used time series data spanning from 1970-2002 to regress GDP per capita on: domestic investment to GDP ratio, FDI

to GDP ratio and human capital. Overall, he found FDI had positive impact on economic growth although insignificant.

A similar study to that of Carkovic and Levine (2002) was done in Egypt by Massoud (2008). Massoud applied instrumental variable technique on panel data over the period 1974-2005 to estimate the effects of FDI inflows on economic growth in Egypt. He also examines whether the potential FDI-induced growth in Egypt depends on the level of educational attainment, trade openness, economic and financial development. Initial output was regressed on: FDI, initial level of human capital, initial GDP per capita, and a set of variables that capture the effect of the efficiency. He concluded that gross FDI inflows to Egypt, as an aggregate, do not exert any positive significant independent effect on growth. Even when depending on the thresholds suggested by the literature, such as human capital stock, level of per capita income, financial development, and imports openness.

Forgha (2009) based on OLS and co-integration error correction mechanism examines the link between FDI and economic performance of Cameroon using data from 1970-2007. They developed models to estimate determinants of FDI and growth. On growth, GDP was regressed on FDI, technology progress, fiscal deficits as GDP ratio, changes in foreign reserves and expected rate of inflation. Forgha concluded that the elasticity of FDI revealed that Cameroon economic performance responds faster to variation in FDI than any of the variable specified in growth model as a 10 percent increase in FDI would lead to a 66 percent increase in economic performance of Cameroon.

Fasanya (2012) used OLS to study the impact of FDI on economic growth in Nigeria. Time series data over the period 1970-2010 was used within error correction model framework.

Fasanya regressed growth rate of GDP on; population growth as a proxy for labour force, growth rate of domestic capital stock, FDI, inflation and exchange rates to capture monetary tool, trade openness and government consumption as a proxy for fiscal policy. He found that foreign direct investment has a positive impact on economic growth in Nigeria.

2.2.3 FDI studies that included Kenyan case

Phillips, *et al.*, (2001) applied least square dummy variable (LSDV) technique to analyze the effects of FDI on economic growth in Kenya, Uganda and Mauritius. Using both annual and five year averages for period 1970 to 1996, they estimated two systems of equation for growth determinants and FDI. They concluded FDI has a strong stimulus effect on economic growth but it is not a universal remedy in overall improvement of economic growth. It also stimulates domestic investment with one percent increase in the FDI/GDP ratio followed by as much as a 0.80% increase in future domestic investment/GDP ratio in Africa.

Ahmad, *et al.*, (2003) applied common effect, fixed effects and random effects models to examine the impact of FDI among other variables on economic growth. Using cross-sectional data from 32 countries Kenya inclusive over 1965-1992. They expanded the classical production function by applying Taylor series approximation and incorporating depreciation of both domestic and foreign investment. They found impact of FDI on real GDP to be generally positive though the relationship was not significant with Kenya having negative effect of 3.60

2.3 Overview of the literature

Although a large number of studies appear to favour the conventional assumption that FDI has positive effect on growth; from the empirical findings above, the results differ greatly; some studies find evidence of positive effects, others find such evidence does not exist, while the third group finds the effects depend on certain host conditions.

In addition, literature fails to strike a consensus on various conditions a host country should possess for FDI to positively impact on the economy. While some empirical studies find FDI impact on economy depends on stock of human capital, trade openness conditions, others studies refute these findings suggesting FDI does not depend on any pre-condition to effect the economy.

Thus, Kenya lacks specific studies focusing on thresholds suggested in empirical literature to influence the impact of FDI positively on economic growth (stock of human capital and trade openness). Such study might bring on board unique attributes of Kenyan economy which has not been captured by cross-country studies.

It is thus imperative to conduct a study on effects of aggregate FDI on growth in Kenya over period 1985-2011 with particular attention to the variable FDI and its interaction with trade openness and stock of human capital as hypothesised in literature.

CHAPTER THREE

3.0 Research Methodology

This chapter provides theoretical framework, model specification and data type which lay the foundation for our empirical analysis and findings in the subsequent chapter.

3.1 Theoretical Framework

In analyzing the impact of FDI on economic growth in Kenya, this study adopted the growth accounting model developed by Solow (1956). In this model; the impact of FDI on the growth rate of output was constrained by diminishing returns to physical capital. Therefore, FDI could not alter the growth rate of output in the long run.

To overcome the shortcomings of diminishing returns to physical capital, we extend Solow's model so that FDI can affect not only the level of output but also its rate of growth in long-run. We make use of the same footsteps as in endogenous models extended by Balasbramanyan et al. (1996) and Ahmad et al. (2007) to quantify the impact of FDI on Kenyan economic growth.

To develop a suitable model that links FDI and economic growth, we consider economic growth (GDP) as a function of FDI and other variables. We start with a basic production function, which defines a linear relationship between output and factors of production namely; Capital (K) and Labour (L) as follows;

$$Y = g[L, K] \tag{1}$$

Theory suggests that FDI is likely to result in technological innovations and learning by doing (de Mello, 1999). Hence, we incorporate a symbol \tilde{v} to represent vector of variables to capture

technological progress amongst other determinants which explains output that is not accounted for by the growth in factors of production specified in equation (2), hence;

$$Y = g[L, K, \tilde{V}] \quad (2)$$

From equation (2) above, and based on most literatures, we assume total capital stock (Tk) have two components; domestic capital stock (D_k) and foreign owned capital stock (F_k) such that;

$$tK = D_k + F_k \quad (3)$$

Plugging equation (3) into equation (2) above shows the real output will be a function of domestic capital stock, foreign capital stock, labour and a vector of variables that determines growth;

$$Y = g[L, D_k, F_k, \tilde{V}] \quad (4)$$

In this study, the \tilde{V} symbol will enable us extend equation (4) above to capture variables often included in long-run growth studies and may impact on FDI inflows as well as affect the beneficial impact of FDI to Kenyan economy.

Assuming equation (4) above to be linear in log form, we take logs and differentiate with respect to time to obtain;

$$\ln Y = \ln L + \ln D_k + \ln F_k + \ln \tilde{V}, \quad \text{Differentiating, we get;}$$

$$y = \beta_0 + \beta_1 l + \beta_2 d_k + \beta_3 f_k + \gamma \tilde{V} + \varepsilon_t \quad (5)$$

The study measures the impact of FDI on economic growth. Theory and empirical evidence suggests that FDI is positively correlated with economic growth. In addition it also suggests that certain host country conditions are necessary for FDI to have potential impact on the economy.

We thus replace vector of variables in equation (5) above to include exogenous variables; Exports (EXP), Inflation (INF) and the interaction terms; between FDI and Exports (FDEXP)

and between FDI and labour force (FDRgrowL) as done by Massoud (2008), Carkovic and Levine (2002). Thus, equation (5) becomes;

$$RGDP = \beta_0 + \beta_1 l + \beta_2 d_k + \beta_3 f_k + \beta_4 \text{exp} + \beta_5 \text{Inf} + \beta_6 \text{fd exp} + \beta_7 \text{fdrgrowl} + \varepsilon_t \quad (6)$$

Where small case letters represent growth rates while ε_t ; is the error term.

3.2 Model Specification

From most growth accounting framework: capital stock is measured by share of investment in GDP, accordingly; we replace change in domestic capital stock input d_k and change in foreign capital inputs f_k in equation (6) above by ratio of domestic investment in GDP (DI/GDP) and ratio of foreign direct investment in GDP (FDI/GDP).

Therefore, the postulated long run empirical model of FDI on Kenya's economic growth to form our basis of empirical estimation in subsequent chapter will be as follows;

$$\Delta RGDPGR = \beta_0 + \beta_1 \Delta RgrowL + \beta_2 \Delta \left(\frac{DI}{GDP} \right) + \beta_3 \Delta \left(\frac{FDI}{GDP} \right) + \beta_4 \Delta EXP + \beta_5 \Delta INF + \beta_6 \Delta FDEXP + \beta_7 \Delta FDRgrowL + \varepsilon_t \quad (7)$$

Where; Δ is the difference and ε_t is the stochastic disturbance term, RGDPGR = real GDP growth rate, RgrowL = real growth rate labour force, DI = ratio of domestic investment in GDP, FDI = ratio of FDI flows in GDP, EXP = exports, and INF = inflation rate, while FDEXP, FDRgrowL are the interaction terms.

Parameters $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$ represent the elasticities of; output, labour, domestic capital stocks, foreign capital stocks, exports, inflation, FDEXP, FDINF and FDRgrowL

respectively. The coefficients of interest will be β_3 , β_6 , and β_7 which capture the effects of FDI and its interaction terms on growth. If the coefficients are significantly different from zero, then we will conclude that FDI and interaction terms have a significant effect on Kenyan economic growth.

3.3 Data type and Source

The study will use secondary data in assessing how foreign Direct Investment impacts on Kenya's economic growth. A time series data over the period 1985 to 2011 for the variables exports, inflation, real labour force and domestic investment will be collected from World Bank database, while data on FDI inflows (FDI stock) will be obtained from UNCTAD database. The expectations and description of the variables of interest in this study are discussed below.

Growth rate of real GDP; this is a proxy variable that will be used to represent economic growth in Kenya. For consistence, data on annual percentage growth in real GDP will be used.

Growth rate of labour force; this variable represent growth in labour force in the Kenyan economy over the study period. Data on real labour force growth will be used as proxy variable. The relationship between population growth rate and output is expected to be positive if labour has been engaged on productive activities or negative if labour has been engaged in unproductive activities.

Inflation is used as a proxy variable to represent macroeconomic stabilities/ instability experienced in the economy. It is a key indicator of fiscal and monetary policies of a country; a lower inflation rate will mean better climate for investment and therefore economic growth. Data on inflation, consumer prices (annual %) will be used. From economic theory, the expected the relationship between inflation and the dependent variable is negative.

Ratio of FDI in GDP is used as a proxy variable to represent contribution of foreign capital input in GDP. The study will use net FDI inflows as percentage of GDP. From economic theory, we expect the relationship between net FDI inflows and the dependent variable (GDP) to be positive. However, for the purpose of this study, the coefficient of FDI is positive according to complementary hypothesis but uncertain according to dependency hypothesis.

Ratio of domestic investment in GDP is used as a proxy variable to represent contribution of domestic investment in GDP. The study will use gross fixed capital formation as percentage of GDP. The expected relationship between this variable and the dependent variable is expected to be positive.

Export; we include this variable due to: a) its capability in improving technological progress due to competition and; b) it alleviates serious foreign exchange gap and open up the economy to international market. In addition, the variable is included to analyze the importance of export oriented economy. Data on exports of goods and services percentage GDP will be used and the coefficient is expected to be positive.

Other variables: FDEXP and FDRgrowL variables are conditions included in the model to enable the study find out impact of FDI inflows on economic growth in Kenya in presence of trade openness and, human capital stock respectively. The interaction terms are obtained through multiplication of FDI with; exports and, labour force and their signs will be determined by empirical analysis.

3. 4 Pre-estimation tests

3.4.1 Stationarity Analysis

The study uses annual time series data to carry its empirical analysis; the main problem associated with such observations is lack of independence of observation across time. If we use OLS to estimate relationships of variables of a non-stationary series, we are likely to have misleading inferences which appear either as spurious regressions or inconsistent regression problems. Augmented Dickey-Fuller (ADF) tests will be relied in determining stationarity of the variables.

3.4.2 Co-integration Analysis

Co-integration implies existence of a long run relationship between economic variables. We therefore carry tests of unit root hypotheses to test whether two or more integrated variables deviate significantly from certain relationship. According to Engel and Granger (1987), a non-stationary time series X_t is said to be integrated of order d or $I(d)$ if it achieves stationarity after being differenced d times.

Augmented Dickey-Fuller method will be used to test for unit roots in the residuals of cointegrating relationships. The null hypothesis is that the residuals have unit roots against the alternative of stationary residuals. If the series are cointegrated, we will have to model the long term relationship between variables by specifying an error correction model which integrates short run and long run dynamics of the model. The coefficient of the error correction term will represent the speed of adjustment to the long run equilibrium.

CHAPTER FOUR

4.0 Regression Analysis and Discussion of Results

This chapter provides detailed empirical analysis of the variables under study such as descriptive statistics, unit roots tests, cointegration tests and, long-run modelling to enables us capture the actual effects of FDI and interaction terms on economic growth in Kenya.

4.1 Descriptive statistics

The summary statistics of the variable used in this empirical study are presented in Table 3 below. The mean value of growth rate of GDP is 3.61 with FDI as a percentage of GDP having the lowest mean value of 0.57 and Exports having the highest mean value of 26.13. FDEXP and INF vary significantly in the sample; with FDEXP ranging from 0.2237 to 98.417 and INF from 1.55 to 45.98

The analysis was also strengthened by the values of the skewness and kurtosis of all the variables involved in the models with Jarque-Bera normality test showing that all variables used in this study are normally distributed.

Table 3: Summary of variables used in the regression analysis

Variable	Mean	Std. Dev	Minimum	Maximum	Skewness	Kurtosis	J-Bera
RGDPGR	3.61	2.24	-0.80	7.18	0.500	1.71	2.42
RgrowL	13.39	10.45	1.55	45.98	0.001	0.20	12.52
GFCF	18.26	1.83	15.39	21.30	0.067	0.008	6.50
FDI	0.57	0.64	0.01	2.68	0.000	0.001	40.17
EXP	26.13	4.43	20.17	38.70	0.004	0.037	20.97
INF	8.01	2.34	3.40	14.97	0.054	0.043	6.95
FDEXP	15.81	21.29	0.22	98.42	0.000	0.000	26.2
FDRgrowL	4.88	6.69	0.03	30.21	0.000	0.000	25.57

Source: Author's Computation.

4.2 Correlation Tests

Correlation tests analyze the static relationship between the variables in the growth regression. For the purpose of this study, we concentrate on RGDPGR, FDI, GFCF, and the interaction terms. The correlation matrix is shown in Table 4 below.

Based on the correlation matrix, with exception of FDI and GFCF which are positively related with RGDPGR, all the other variables are negatively related with RGDPGR. Overall, from the correlation matrix, the interaction terms have high relationship between them which may lead to problem of multicollinearity and hence they will be estimated separately.

Table 4: Correlation matrix at levels.

	RGDPG							FDRgro
	R	RgrowL	GFCF	FDI	EXP	INF	FDEXP	wL
RGDPG								
R	1.0000							
RgrowL	-0.2952	1.0000						
GFCF	0.5229	-0.0462	1.0000					
FDI	0.0465	0.2129	0.0054	1.0000				
EXP	-0.0885	0.7150	0.2701	0.3487	1.0000			
INF	-0.4552	0.3411	-0.0391	0.2893	0.5940	1.0000		
FDEXP	-0.0282	0.2920	-0.0015	0.9715	0.4862	0.4164	1.0000	
FDRgro								
wL	-0.0467	0.3484	-0.0273	0.9695	0.4788	0.3922	0.9941	1.0000

Source: Author's Computation

4.3 Unit Root Test

It is well established that most time series data tend to exhibit a deterministic or stochastic time trend and are therefore not stationary. Engel and Granger (1987) suggests that such prevalence of substantial co-movements among most economic time series data, undermines the policy implications that could be inferred from such modelling constructs.

Hence time series properties of all variables used in empirical estimation were examined for stationarity. The study uses the Augmented Dick-Fuller test (ADF) for unit root and to ensure that the inherent characteristics of time series are captured, the lag lengths is determined using the Akaike Information Criterion (AIC) and ADF tests for differences are only conducted for the variables which are not stationary at levels.

The results of ADF indicate that FDI and interaction terms are stationary at levels, while real GDP growth and Inflation are stationary at 5%. However, all the variables understudy which are not stationary at 1% attains stationarity after first differencing at 1% level as shown in Table 5 below.

Table 5: Results for unit root tests at levels

Variable	ADF Statistics	1% critical value	5% critical value	Inference
RGDPGR	-3.293**	-3.743	-2.997	Non-stationary
RgrowL	-2.347	-3.743	-2.997	Non-stationary
GFCF	-2.552	-3.743	-2.997	Non-stationary
FDI	-6.236*	-3.743	-2.997	Stationary
EXP	-2.080	-3.743	-2.997	Non-stationary
INF	-3.370**	-3.743	-2.997	Non-stationary
FDEXP	-5.938*	-3.743	-2.997	Stationary
FDRgrowL	-5.872*	-3.743	-2.997	Stationary

Note: * / ** implies rejection of null hypothesis at 1% and 5% respectively.

Results for unit-root tests after first differencing

Variable	ADF Statistics	1% critical value	5% critical value	Inference
RGDPGR	-6.171	-3.750	-3.000	1(1)
RgrowL	-5.660	-3.750	-3.000	1(1)
GFCF	-5.430	-3.750	-3.000	1(1)
EXP	-4.419	-3.750	-3.000	1(1)
INF	-6.010	-3.750	-3.000	1(1)

Source: Author's computation

4.4 Cointegration Test

Cointegration helps us to establish whether there exists long run economic relationship amongst variables under study. According to Engel and Granger (1987), a non-stationary time series X_t is said to be integrated of order d or $I(d)$ if it achieves stationarity after being differenced d times.

The study thus employs Engel and Granger two-step method. The two-steps involve estimating the cointegration regression model by OLS, and obtaining the residuals. We then test for stationarity of the residuals using Augmented Dickey-Fuller method; where null hypothesis is that the residuals are non-stationary (have unit roots) against the alternative of stationary residuals.

We estimated our expected cointegration model equation (7) in Chapter III using OLS after dropping the stationary variables and with an assumption that all variables are of integration of order one and obtained the results below.

$$\Delta RGDPGR = 3.51 + 0.55RgrowL - 0.58\left(\frac{DI}{GDP}\right) + 0.01EXP - 0.09INF + \epsilon \quad (8)$$

(0.219 ***) (0.174*) (0.117) (0.038 ***)

Where; $R^2 = 0.3503$, adjusted $R^2 = 0.1881$, Durbin-Watson = 2.75, Standard errors in parenthesis, Observation = 26 and */*** denotes significance at 1% and 10% levels. The Error correction term (ECT) is obtained from the above static equation (8).

We obtained the residuals from the estimated model above and subjected them to Augmented Dick-Fuller test for stationarity. The residuals were stationary at levels as the tau t statistics of -3.892 was far much negative as compared to -3.750, -3.000, -2.630 critical values at 1%, 5% and

10% respectively with Mackinnon p-value of 0.000. This result signifies a long run relationship amongst the variables exists in Kenya.

4.5 Models estimation and Discussion of Results

The presence of cointegration enables us to model the long term relationship between variables by specifying an error correction model which integrates short run and long run dynamics of the model. Hence, the study re-specifies our equation (7) in Chapter III to an Error Correction model (ECM) of the form;

$$\begin{aligned} \Delta RGDPGR_t = & \alpha_0 + \sum_t^T \alpha_1 \Delta RgrowL_t + \sum_{t-1}^T \alpha_2 \Delta \left[\frac{DI}{GDP} \right]_{t-1} + \sum_{t-1}^T \alpha_3 \Delta \left[\frac{FDI}{GDP} \right]_{t-1} + \\ & \sum_t^T \alpha_4 \Delta X_t + \sum_t^T \alpha_5 \Delta INF_t + \sum_{t-1}^T \alpha_6 \Delta FDEXP_{t-1} + \sum_{t-1}^T \alpha_7 \Delta FDRgrowL_{t-1} + \\ & \sum_{t-1}^T \alpha_9 ECT_{t-1} + v_t \end{aligned}$$

Where; ECT is as defined above with its coefficient α_6 expected to be negative and it represents speed of adjustment in the long run equilibrium, while symbol Δ is the difference. We estimate the above equation using OLS and the coefficients α_1 , α_2 , α_3 , α_4 , and α_5 will be interpreted as long-run elasticities as done by Fasanya (2012) while the coefficients α_6 , and α_7 of the interaction terms will be interpreted same way as in Carkovic, *et. al.*, (2002) and Massoud (2008)

To control for endogeneity between FDI and economic growth, most studies accounts for endogeneity by including lagged values of FDI in their regressions due to the difficult of identifying good instruments. Therefore, this study accounts for endogeneity by lagging FDI and its interaction terms as done by Wang (2002).

To capture our specific objectives roman (ii) and (iii) as spelt in Chapter One; the study estimates three models tabulated in Table 6, 7 and 8. The first model is the basic model which includes the error correction term but we drop all the interaction terms. The results are as tabulated in Table 6 below;

Table 6: Effects of annual net FDI inflows % GDP on growth in Kenya using OLS (1985-2011)

Dependent Variable: Real GDP growth

Method: Least Squares

Sample(adjusted): 1988 - 2011

Variable	Coefficient	Std. Error	Prob.
Constant	-8.05	5.001	0.126
RgrowL	-0.58	0.284***	0.055
Lagged GFCF	0.25	0.226	0.276
Lagged FDI	0.30	0.673	0.642
EXP	0.53	0.166*	0.006
INF	-0.17	0.049*	0.003
Lagged ECT	-0.81	0.457***	0.096
R ²	0.54	Adjusted R ²	0.3813
F statistic	3.36	Prob > F	0.0226
Durbin-Watson stat	2.00	Observations	24

Note: */*** indicates significance at 1% and 10% respectively.

Source: Author's Computation

From the results presented in Table 6 above; the variables Rgrowl, lagged FDI, lagged GFCF, EXP, and INF takes the expected sign that is consistent with the economic theory and literature as the study expected. Since hypothesis testing cannot be conducted about the coefficients of the cointegrating relationships, the study does use p-values to derive its inferences.

From Table 6, the results show that FDI does exert positive insignificant impact on Kenyan economic growth. The coefficient of FDI implies that one percent change in lagged FDI, real GDP growth (RGDPGR) in Kenya changes by approximately 0.30 percent in long run. Lack of FDI significance effect on the economy may be attributed to low inflows of FDI into Kenya.

This result is consistent with study by Obwona (1999) in Uganda, Adeolu (2007) in Nigeria among others.

The results shows labour had a negative significant effect of 0.58 on economic growth in Kenya which is statistically significant at 10% level. This implies that one percentage increase in real labour force growth leads to 0.58 percent decrease in real GDP growth long-run. This phenomenon could be explained by the fact that most of labour force could have been either unemployed or involved in unproductive activities over the study period.

The lagged domestic investment (GFCG) variable has a positive magnitude impact of 0.25 which implies a percentage increase in domestic investment leads to 0.25 percent increase in real GDP growth in the estimated in long-run. However, the potential effects are statistically insignificant which makes us conclude that Kenya did not invest enough over the study period to drive substantial economic growth.

As expected, Inflation is statistically significant with a negative coefficient of 0.17 at 1% significance level. This indicates that a percentage rise in inflation levels reduces the economic growth by 0.17 percent in long run, suggesting that Kenya should focus on sound macroeconomic policies that will reduce the cost of capital.

Exports have a positive statistically coefficient of 0.53 at 1% significance level which implies that one percentage rise in exports would lead to real GDP growth by 0.53 percent in long run. Hence, Kenya should enhance policies that would encourage value addition to her primary exports to ensure she harness more from Exports. This result is consistent with Massoud (2008); Obwona (2009); and Adeolu (2007)

In our estimated 2nd model, we include the interaction term between FDI and trade openness (FDEXP) in our basic 1st model in Table 6 and the results are tabulated in Table 7 below;

Table 7: Effects of annual net FDI inflows % GDP on growth in Kenya using OLS 1985-2011 in presence of trade openness (FDEXP)

Dependent Variable: Real GDP growth

Method: Least Squares

Sample(adjusted): 1988 - 2011

Variable	Coefficient	Std. Error	Prob.
Constant	-6.92	5.404	0.218
RgrowL	-0.66	0.314***	0.052
Lagged GFCF	0.25	0.231	0.299
Lagged FDI	-1.53	3.004	0.618
EXP	0.51	0.171*	0.008
INF	-0.17	0.051*	0.005
Lagged FDEXP	0.06	0.093	0.542
Lagged ECT	-0.83	0.467***	0.095
R ²	0.55	Adjusted R ²	0.36
F statistic	2.83	Prob>F	0.04
Durbin-Watson stat	2.04	Observations	24

Note: */*** indicates significance at 1% and 10% respectively.

Source: Author's Computation

From table 7 above; the variables Rgrowl lagged GFCF, EXP, and INF takes the expected sign as the study expected. In addition, the findings and interpretations derived in Table 7 above on the variables Rgrowl, lagged GFCF, EXP, and INF remain the same as in Table 6 with exception of a change in magnitude.

Labour force still remained with a negative coefficient of -0.66 which is statistically significant at 10% level. The domestic investment (GFCG) variable has positive magnitude of 0.25 as in the 1st model although still insignificant. Inflation and Exports remain statistically significant at 1% level, with a negative coefficient of 0.17 and a positive coefficient of 0.51 respectively. FDI has a coefficient of negative 1.53 which implies with a percent change in FDI to GDP ratio, real GDP growth declines by 1.53 percent in long run.

In Table 7 above, we incorporated the interaction term between FDI and Exports (FDEXP). Balasubramanian, *et al.*, (1996) study on the impact of FDI on economic growth argued that the positive effect that FDI potentially has on growth is dependent on the level of trade openness regime. They concluded that outward oriented regimes harness more from FDI as opposed to the inward oriented ones.

The study tests this evidence in Kenya by including the interaction term FDEXP in our growth regressions model in Table 7. The interaction term has a positive impact of 0.05 on economic growth in Kenya which implies that a percentage increase in trade openness in presence of FDI increases the economic growth by 0.06 percent in long-run. However, the coefficient of this variable is insignificant.

In addition, the inclusion of the interaction term leads to a reduction in potential FDI impact on economic growth from 0.30 percent in 1st regression model in Table 6 to a negative impact of 1.52 percent as seen in 2nd regression model in Table 7. The study thus fail to concur with the argument that trade openness helps FDI to influence growth positively in Kenya as the coefficient of the interaction term interacts insignificantly with FDI and; it changes the positive effect of FDI on growth in long run as can be seen from the coefficients and p-values presented in Tables 6 and 7 above.

In our estimated 3rd model, we include the interaction term FDRgrowL in our basic 1st model in Table 6 but drop the variable FDEXP with a view to control multicollinearity between the interaction terms. The results are presented in Table 8 below;

Table 8: Effects of annual net FDI inflows % GDP on growth in Kenya using OLS 1985-2011 in presence of human capital stock (FDRgrowL)

Dependent Variable: Real GDP growth

Method: Least Squares

Sample(adjusted): 1988 - 2011

Variable	Coefficient	Std. Error	Prob.
Constant	-7.17	5.18	0.19
RgrowL	-0.69	0.32**	0.045
Lagged GFCF	0.26	0.23	0.27
Lagged FDI	-2.02	3.01	0.51
EXP	0.52	0.17*	0.007
INF	-0.16	0.29*	0.006
Lagged FDRgrowL	0.23	0.29	0.44
Lagged ECT	-0.85	0.39***	0.09
R ²	0.56	Adjusted R ²	0.37
F statistic	2.91	Prob>F	0.365
Durbin-Watson stat	2.08	Observations	24

Note: */**/** shows significance at 1%, 5% and 10% respectively.

Source: Author's Computation

From table 8 above; we observe same trend in variables Rgrowl, lagged GFCF, EXP, and INF as in Tables 6 and 7. All exogenous variables take an expected sign that is consistent with the economic theory and literature as the study expected. In addition, the findings and interpretations derived in Table 8 above remains the same as those of Table 6 and 7 with exception of a change in magnitude.

Real growth in labour force still remains with a negative coefficient of -0.69 which is statistically significant at 5% level. The domestic investment (GFCG) variable has positive magnitude of 0.26 although still insignificant. Inflation and Exports remain statistically significant at 1%, with a negative coefficient of 0.17 and a positive coefficient of 0.51 respectively. FDI has a coefficient of negative 2.02 which implies with a percent change in FDI to GDP ratio, real GDP growth declines by 2.02 percent in long run.

Again in Table 8 we incorporated the interaction term between FDI and real growth in labour force (FDRgrowL). This follows Borenzstein, *et. al.*, (1995) study which concluded that there has to be a minimum threshold of human capital stock in host country before it can start to reap the positive effects of FDI on growth.

The study tests this evidence in Kenya by including the interaction term FDRgrowL as an additional independent exogenous variable. Results indicate that a percentage increase in labour force in presence of FDI increases the economic growth by 0.23 percent in long-run. However, the coefficient of the interaction term interacts insignificantly with FDI as seen from their coefficient and p-values presented in Table 6 and Table 8 respectively.

The study thus fails to concur with the argument that FDI depends on the human capital stock to influence growth positively in Kenya as: the coefficient of the interaction term is insignificant and; its inclusion in the model changes the sign of the coefficient of FDI from positive in the 1st regression model in Table 6 to negative in the 3rd regression model in Table 8. This suggests that FDI enhances growth regardless of human capital stock levels, however, the coefficient is not significant and thus we cannot draw this conclusion. Such finding is consistent with the literature on empirical analysis of FDI and growth (Carkovic, *et. al.*, 2002)

On the speed of adjustment, the coefficient of the error correction term (ECT) has the expected negative sign with a magnitude of -0.81 in Table 6, -0.83 in Table 7 and, -0.85 in Table 8. Statistically, the error correction term is significant at 10% level in all the models which implies that 81%, 83% and 85% of any disequilibrium in the long-run real GDP growth in the 1st, 2nd, and 3rd models respectively adjusts to changes in explanatory variables in subsequent period.

Finally, we performed some diagnostic tests to ensure the results presented are statistically valid: the Durbin-Watson test for auto correlation presented in Table 6, 7 and 8; Ramsey RESET test for omitted variables and; the Breusch-Pagan test for heteroscedasticity (*see Table 10 in the Annex*). Both the Durbin-Watson and Breusch-Pagan statistics across the models shows there is no serial correlation or heteroscedasticity problem while Ramsey RESET test confirms that all models are well specified. These results are complimented by R^2 which shows that over 54 percent of the variations in real GDP growth is explained by the explanatory variables in all estimated models.

4.6 Sensitivity analysis

Instead of using net FDI inflows percentage GDP, we re-ran the regressions using FDI stock weighted by annual percentage GDP. This was done with assumption that FDI stock flows portray FDI in the real economy which is likely to contribute to production activities and economic growth. However, with exception of a change in magnitude of exogenous variables the results were consistent with our previous findings (*see Table 11 in the Annex and compare with results in Table 6, 7 & 8 above*).

CHAPTER FIVE:

5.0 Summary of study findings

This chapter provides summary, conclusions and policy recommendations based on the findings deduced from Chapter Four

5.1 Summary

The study set out to: analyse trends in FDI and economic growth; investigate whether the potential FDI-induced growth in Kenya depends on the level of human capital stock and trade openness as hypothesized in literature and; establish the impact of aggregate FDI in Kenyan economic growth over the period 1985-2011. Growth rate of real GDP is the dependent variable in all regressions, with net FDI inflows as a percentage of GDP, exports, labour, domestic investment, inflation and, the interaction terms; between FDI and labour, FDI and exports being the key explanatory variables.

From the analysis: the trends of FDI and Kenyan economic growth are both mixed over time and moving in opposite direction as shown in Figure 2 in Chapter One. On the effects of FDI on Kenyan economic growth, the empirical analysis shows that FDI inflows, as an aggregate, induce the nation's economic growth positively although such effects are not significant. This however, is affected by inclusion of thresholds suggested in literature such as trade openness and stock of human capital, which makes FDI impact negatively and insignificantly on economic growth in Kenya.

While both domestic investment and FDI has a positive insignificant impact on economic growth as can be seen in Table 6; policies should be developed to encourage both forms of investment in long run to ensure Kenya saves and invest enough to warrant significant economic growth. In

addition, Exports should be encouraged at all cost while ensuring policies are developed to curb idle unproductive labour force while ensuring inflation is at required targets.

5.2 Conclusions

Based on the above results on the impact of FDI on economic growth, we can therefore conclude that net FDI inflows exerts a positive insignificant effect on economic growth in Kenya regardless of the two thresholds suggested in the literature; stock of human capital or trade openness.

In addition, increased external trade activities can spur economic growth in Kenya as export coefficient is strongly significant in this study. Export earnings can be spearheaded by an export-led growth strategy through provision of sound macroeconomic policies that will absorb the idle/unproductive labour force; help keep inflation at bay and; help in diversifying Kenyan exports.

5.3 Policy Recommendations

The findings so far have important implications for policy formulations; the existence of long-run positive relationship between FDI and economic growth in Kenya is important for policy making when designing FDI promotional policies. From the study; potential FDI impact on Kenyan economic growth does not depend on trade openness or human capital stock as suggested in literature.

As such, Kenya should not use availability of cheap factors of production and trade openness incentives as a means of attracting FDI inflows. Instead, she should embark on policies that promote sound macroeconomic policies to increase and diversify exports, curb inflation and ensure factors of production are fully utilised. Monetary incentives should be discouraged in

attracting FDI inflows and instead prioritise the provision of infrastructure, sound investment climate and political stability as way of attracting foreign investors.

The model used in this study: did not incorporate a variable to capture effects of incentives in attracting FDI; did not test all thresholds suggested in literature and; did not test whether the source of FDI matters in determines its effect on growth. In addition, lack of sector specific data on FDI led the study to just narrow on aggregate FDI inflows.

Hence, the study proposes more research be focused on: the extent to which incentives affects FDI inflows into Kenya; the potential FDI sector performance in promoting economic growth; whether the source of FDI matters and; to test all thresholds suggested in literature so as to provide overall FDI effect on economic growth in Kenya. Study in aforesaid areas will enable the country develop optimal policies that will enable the economy harness the best out of foreign direct investment.

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APPENDIX:**Table 9: Data used in regression analysis**

Year	RGDP GR	Rgrow L	GFCF	FDI	EXP	INF	FDEXP	FDRgro wL
1985	7.18	5.13	19.64	0.45	25.85	2.53	11.63	2.31
1986	4.3	5.06	17.27	0.47	25.3	13.01	11.89	2.38
1987	5.94	7.52	19.63	0.49	21.31	8.64	10.44	3.68
1988	6.2	3.46	20.45	0.01	22.37	12.26	0.22	0.03
1989	4.69	5.46	19.46	0.75	23.03	13.79	17.27	4.09
1990	4.19	5.12	20.65	0.67	25.69	17.78	17.21	3.43
1991	1.44	8.29	19.03	0.23	27.04	20.08	6.23	1.91
1992	-0.8	8.89	16.58	0.07	26.26	27.33	1.84	0.62
1993	0.35	11.94	16.94	2.53	38.9	45.98	98.42	30.21
1994	2.63	14.97	18.87	0.1	37.04	28.81	3.70	1.49
1995	4.41	11.8	21.39	0.46	32.59	1.55	14.99	5.43
1996	4.15	8.92	16.01	0.9	25.2	8.86	22.68	8.03
1997	0.47	8.48	15.39	0.47	22.69	11.36	10.66	3.98
1998	3.29	7.77	15.67	0.19	20.17	6.72	3.83	1.47
1999	2.31	7.63	15.59	0.4	20.83	5.74	8.33	3.05
2000	0.6	7.7	16.71	0.88	21.59	9.98	18.99	6.77
2001	3.78	7.61	18.15	0.04	22.93	5.74	0.92	0.30
2002	0.55	7.11	17.23	0.21	24.89	1.96	5.23	1.49
2003	2.93	6.29	15.83	0.55	24.08	9.82	13.24	3.45
2004	5.1	8.9	16.26	0.27	26.61	11.62	7.18	2.40
2005	5.91	7.49	18.69	0.11	28.51	10.31	3.14	0.82
2006	6.33	8.03	19.08	0.26	27.11	14.45	7.05	2.08
2007	6.99	8.54	19.37	2.68	26.78	9.76	71.77	22.87
2008	1.53	7.2	19.43	0.31	27.61	36.24	8.56	2.23
2009	2.73	8.8	19.66	0.38	24.15	9.23	9.18	3.34
2010	5.76	9.2	20.32	0.55	27.79	3.96	15.28	5.06
2011	4.38	8.85	20.39	0.99	29.11	14.02	28.82	8.76

Table 10: Diagnostic Tests Results for all models estimated

Test	Model					
	1		2		3	
	F/Chi2	Probability	F/Chi2	Probability	F/Chi2	Probability
Ramsey RESET test	0.45	0.7218	0.21	0.8879	0.20	0.8934
Breusch-Pagan test	1.04	0.3077	1.03	0.3092	0.58	0.4478

Source: Author's Computation

Note: The Ramsey RESET tests for omitted variables were carried under the hypothesis;

H₀: model has no omitted variables

H₁: model has omitted variables

The study used p-values tabulated in Tables 10 above to derive conclusions that the models are well specified. If however, the p-value would have been less than alpha (α) we would have rejected the null hypothesis.

The Breusch-Pagan test was carried under the hypothesis;

H₀: Homoscedasticity

H₁: Heteroscedasticity

The study used p-values tabulated in Tables 10 above to derive conclusions of homoscedasticity across the models estimated and hence there is no problem of heteroscedasticity in residuals estimated.

Table 11: Data used in Sensitive Regression Analysis

Year	RGDPG		Rgrow					FDRgrow	
	R	L	GFCF	FDI	EXP	INF	FDEXP	L	
1985	7.18	5.13	19.64	0.66	25.85	2.53	17.06	3.36	
1986	4.3	5.06	17.27	1.18	25.3	13.01	29.85	5.97	
1987	5.94	7.52	19.63	0.92	21.31	8.64	19.60	6.92	
1988	6.2	3.46	20.45	0.89	22.37	12.26	19.90	3.08	
1989	4.69	5.46	19.46	1.3	23.03	13.79	29.93	7.09	
1990	4.19	5.12	20.65	1.59	25.69	17.78	40.84	8.14	
1991	1.44	8.29	19.03	4.77	27.04	20.08	128.98	39.54	
1992	-0.8	8.89	16.58	-8.66	26.26	27.33	-227.41	-76.98	
1993	0.35	11.94	16.94	19.85	38.9	45.98	772.16	237.01	
1994	2.63	14.97	18.87	2.66	37.04	28.81	98.52	39.82	
1995	4.41	11.8	21.39	1.66	32.59	1.55	54.09	19.58	
1996	4.15	8.92	16.01	1.79	25.2	8.86	45.10	15.96	
1997	0.47	8.48	15.39	16.93	22.69	11.36	384.14	143.56	
1998	3.29	7.77	15.67	2.45	20.17	6.72	49.41	19.04	
1999	2.31	7.63	15.59	3.55	20.83	5.74	73.94	27.07	
2000	0.6	7.7	16.71	15.53	21.59	9.98	335.29	119.58	
2001	3.78	7.61	18.15	2.48	22.93	5.74	56.86	18.87	
2002	0.55	7.11	17.23	17.54	24.89	1.96	436.57	124.71	
2003	2.93	6.29	15.83	3.57	24.08	9.82	85.96	22.46	
2004	5.1	8.9	16.26	2.14	26.61	11.62	56.94	19.05	
2005	5.91	7.49	18.69	1.88	28.51	10.31	53.59	14.08	
2006	6.33	8.03	19.08	1.84	27.11	14.45	49.88	14.78	
2007	6.99	8.54	19.37	2.71	26.78	9.76	72.57	23.14	
2008	1.53	7.2	19.43	12.99	27.61	36.24	358.65	93.53	
2009	2.73	8.8	19.66	7.71	24.15	9.23	186.19	67.85	
2010	5.76	9.2	20.32	3.96	27.79	3.96	110.04	36.43	
2011	4.38	8.85	20.39	5.98	29.11	14.02	174.07	52.92	

Table 12: Results of the Sensitive Regression Analysis**Effects of annual FDI stock/GDP on growth in Kenya using OLS (1985-2011)**

Dependent Variable: Real GDP growth

Method: Least Squares

Sample(adjusted): 1988 - 2011

Variable	Coefficient	Std. Error	Prob.
Constant	-8.34	5.017	0.115
RgrowL	-0.57	0.300***	0.074
Lagged GFCF	0.26	0.265	0.252
Lagged FDI stock	0.02	0.065	0.825

EXP	0.52	0.170*	0.007
INF	-0.16	0.044*	0.002
Lagged ECT	-0.82	0.467***	0.096
R ²	0.54	Adjusted R ²	0.375
F statistic	3.30	Prob > F	0.0243
Durbin-Watson stat	2.00	Observations	24

Note: */*** indicates significance at 1% and 10% respectively.

Effects of annual FDI stock/GDP on growth in Kenya using OLS (1985-2011) with inclusion of the interaction term FDEXP

Variable	Coefficient	Std. Error	Prob.
Constant	-7.06	5.759	0.237
RgrowL	-0.61	0.318***	0.072
Lagged GFCF	0.24	0.235	0.311
Lagged FDI	-0.12	0.288	0.676
EXP	0.50	0.177*	0.012
INF	-0.16	0.045*	0.003
Lagged FDEXP	0.01	0.009	0.631
Lagged ECT	-0.84	0.478***	0.100
R ²	0.55	Adjusted R ²	0.35
F statistic	2.74	Prob>F	0.05
Durbin-Watson stat	2.09	Observations	24

Note: */*** indicates significance at 1% and 10% respectively.

Effects of annual FDI stock/GDP on growth in Kenya using OLS (1985-2011) with inclusion of the interaction term FDRgrowL

Variable	Coefficient	Std. Error	Prob.
Constant	-6.77	5.427	0.230
RgrowL	-0.66	0.322**	0.057
Lagged GFCF	0.25	0.229	0.288
Lagged FDI	-0.21	0.285	0.472
EXP	0.50	0.173**	0.010
INF	-0.16	0.044*	0.003
Lagged FDRgrowL	0.03	0.310	0.430
Lagged ECT	-0.83	0.472***	0.098
R ²	0.56	Adjusted R ²	0.36
F statistic	2.87	Prob>F	0.36
Durbin-Watson stat	2.09	Observations	24

Note: */**/* indicates significance at 1%, 5% and 10% respectively.

Source: Author's Computation