IMPACT OF REMITTANCES INFLOWS ON ECONOMIC GROWTH IN KENYA

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DECLARATION

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

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DEDICATION

This research paper is dedicated to my beloved wife Susan, my son Ranzie and my loving parents Francis and Julia. May the almighty God bless you.

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First is to thank the Almighty God for giving me the opportunity and capacity to undertake this course.

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May God bless you all.

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LIST OF ABBREVIATIONS AND ACRONYMS

ADB   African Development Bank

ADF   Augmented Dickey-Fuller test

ARCH   Auto-Regressive Conditional Heteroskedasticity

ARDL   Autoregressive Distributed Lag

BLUE   Best Linear Unbiased Estimates

CBK   Central Bank of Kenya

CPI   Consumer Price Index

ECM   Error Correction Mechanism

FDI   Foreign Direct Investment

FIN   Financial Development

GDP   Gross Domestic Product

GFCF   Gross Fixed Capital Formation

GNI   Gross Nation Income

GoK   Government of Kenya

HC   Human Capital

IMF   International Monetary Fund

IOM   International Organization for Migration

OLS   Ordinary Least Square

OPN   Openness

RD   Research and Development

REM   Remittances

SSA   Sub-Saharan Africa

UN   United Nations

USD   United State Dollar

WB   World Bank

WDI   World Development Indicator

ABSTRACT

The purpose of this research paper was to investigate whether or not international remittances enhance economic growth in Kenya. Data for the period 1970-2012 from World Development Indicator and Kenya's economic surveys was used. To investigate the impact of international remittances, financial development, gross fixed capital formation, human capital, openness to international trade and inflation were also included. The study employed an aggregate Cobb-Douglas production function. Augmented Dickey Fuller tests were used to test for non stationarity of the variables. It was found that all variables were integrated of order one. In addition, Johansen cointegration test was employed to determine whether or not the variables were cointegrated. Error correction model was employed to estimate short – run and long run relationship using ordinary least square technique.

The study found that international remittances inflows and human capital (secondary school enrollment) had a positive but insignificant impact on economic growth. Financial development (credit to private sector by commercial bank), gross fixed capital formation and inflation (consumer price index) were found to enhance economic growth significantly. The results show that emphasis should be placed on accumulating capital and improving financial development to accelerate growth. There is also need to sustain stable macroeconomic environment (inflation should be maintained at a certain threshold) for economic growth be achieved in Kenya Openness to international trade was found to have negative and significant impact on economic growth. This was in contrast with the expected result of positive and significance impact on economic growth rate.

CHAPTER ONE

INTRODUCTION

1.1 Background

Millions of people are either moving from one country to another or within a country. International migration occurs when individuals cross country's boundaries and stay in the host country for some minimum period. The United Nations (UN) defines this period as one year. The United Nations (2013) estimated the total number of international migrants in 2010 at 213.9 million, which constituted 3.1% of the world population. The ratio of male to female migrants was 51:49.

Appendix table 1 shows that for the period 1990-2000, the stock of international migrants grew at an average of 2.2 million migrants per year compared to 4.6 million migrants for the period 2000-10. Most international migrants went to developed regions probably because many of the migrants will be in search of better economic terms. It was estimated that the total number of Kenyans in the Diasporas in 2010 was 3 million, approximately 8% of the country's population (GoK, 2011)

According to United Nations (2004), international migration has various economic consequences in home country of the immigrant. First, it eases unemployment rate in the home country of the migrants. Second, it may lead to technology transfer and investment from developed to developing countries. Third, it may drain an economy of its skilled

personnel and reduce tax revenue. Lastly, it is a source of foreign exchange through international remittances.

Workers' remittances to developing countries are determined by many factors. Freund and Spatafora (2008) and Lueth and Ruiz-Arranz (2008) found that the magnitude of emigrants stock in an economy is the main determinant. Singh et al. (2010) found that domestic institutions as measured by the level of political risk are the key determinant. Other factors include transfer costs, exchange rate and financial development in the receiving and host countries.

Remittances are transferred through formal and informal channels. The later is through commercial banks and other authorized financial providers while the former includes self carry or remittances in kind. Kiiru (2010), Abella (1989) and Barajas et al (2009) found that informal remittances may be at least double the recorded figure. World Bank (2011) found that informal channels are preferred to formal ones because cost of money transfer is relatively low, less bureaucratic and individuals remitting remain anonymous.

Globally, international remittances have increased substantially from United State Dollar, (USD) 135billion in 2000 to USD 479 billion in 2011, (WB, 2014). Top recipients were India, China, Mexico and Philippines. The main source of remittances were the United States (USD 51 billion), Switzerland (USD 31 billion), Saudi Arabia (USD 28 billion), and Russia (USD 22 billion). In Sub Saharan Africa, (SSA), the absolute amount grew from USD 4.8 billion in 2000 to USD 31 billion in 2011 with Nigeria receiving USD 10 billion. World Bank (2011) attributed the increased recorded remittances to use of better

data collection methods, tremendous growth in the number of migrants, lower costs and wider network in the industry that support increased remittances. In 2011, SSA countries shared a small proportion (6.4%) of the global remittances. However, their remittances as percentage of GDP was relatively higher at 2.6% than the world average of 0.7 (WB, 2014).

1.2 Flow of Worker Remittances to Kenya

According to Migration Information Source, (MIS) (2003), in the 1980s and early 1990s, many Kenyan professionals migrated to countries whose political and economic stability was promising. In this period as shown in Figure 1, the flow of remittances was gradual may be because migrants were mainly professionals. However, from 1994 more Kenyans migrated to pursue opportunities in low skilled jobs in Gulf countries which led to rapid inflow of remittances to Kenya.

Figure 1. Flow of Workers' Remittances to Kenya, 1970-2012

Source; World Development Indicator (2014)

According to CBK (2014), in August 2014, 49.7%, 24.5% and 25.8% of international remittances in Kenya were from North America, Europe, and rest of the world respectively. This reflects the large number of Kenyan migrants with gainful economic activity living in North America.

Remittances inflows became a key source of foreign exchange in Kenya in the last two decades, (1992-2012). It has helped the country bridge savings-investment gap taking into account Kenya's ratio of gross domestic saving to gross capital formation in 2011 was 1:5 (WB, 2014). Figure 2 shows that, remittances as a proportion of GDP surpassed that of (foreign direct investment), FDI to GDP in 31 years for the sample period.

Figure 2. Worker's remittances and FDI (Percentage of GDP), 1970-2012

Source; World Development Indicator, (2014)

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1.3 Statement of the Problem

Kenya desires to increase economic growth to 10% per year in order to become a middle income country (GoK, 2007). However, the average real economic growth rate for the period 1970-2012 was 4.58% (WB, 2014). Workers' remittances, external source of finance are seen as a potential source of growth. Remittances increased sharply from Kes. 3.19 billion (1.62% of GDP) in 1990 to Kes. 102.58 billion (3.01% of GDP) in 2012 (WB, 2014). The sharp increase in remittances and huge sum involved has led policy makers to consider remittances inflows vital for economic growth. Various measures have been adopted to promote its inflow. The government has responded by adopting various measures to promote remittance inflows. The GoK (2010) acknowledges dual citizenship whereas GoK (2011) advocates for favorable environment to ensure Kenyans in the diasporas remit more. Given the size of remittance inflows to Kenya, a key question is: Do remittances enhance economic growth in Kenya?

Previous studies of the effect of remittances on economic growth reveal mixed findings. Stahl and Arnold (1986), Pradhan et al. (2008) and Ekanayake and Mihalis (2008) found remittances enhance economic growth. Siddique et al., (2012) found no causal link between remittances and economic growth in India. In addition, most existing studies focus on cross country data to examine the impact of international remittances on economic growth. This restricts the impact of remittances on economic growth to be the same for several countries despite differences such as potential GDP, unemployment rate and political risk of each country. Few country-specific studies are available for African economies. In particular, it is unclear whether economic growth in Kenya would be lower

or higher in the presence of remittance inflows. The purpose of this paper is to study the overall impact of remittances on economic growth in Kenya using time series data for the period 1970-2012.

1.4 Objectives of the Study

The main objective of this study is to examine the relationship between international remittances inflows and economic growth in Kenya. The specific objectives are;

    (a) To estimate the impact of international remittances inflows on economic growth in Kenya.

    (b) Suggest policy recommendation based on findings of (a).

1.5 Hypothesis

This research study tested the following hypothesis:

Ho: There is no significant relationship between international remittances inflows and economic growth in Kenya

Ha: There is significant relationship between international remittances inflows and economic growth in Kenya

1.6 Significance of the Study

Magnitude of remittances inflows in Kenya has increased sharply and there is need to examine their impact on economic growth. Previous impact of international remittances on economic growth has revealed mixed findings; positive, negative as well as indifference hence the need for more research. Given the challenge of economic growth Kenya faces, resources are required. It's often assumed that remittances enhance

economic growth without empirical evidence despite the theoretical ambiguity. The regression results provide information about Kenya's economic position in regards to remittances. The government can use the findings of the study in policy formulation to increase the economic growth rate to 10% target in Vision 2030.

The findings will also help in understanding the impact of financial development, openness to international trade, gross fixed capital formation, inflation and human capital on economic growth in Kenya. Thirdly, using long time series data of 43 years for Kenya provides sufficient degree of freedom to model the relationship between the explanatory and dependent variable. The estimates for parameters are more accurate.

This chapter commences with a theoretical review of the relationship between remittances and economic growth. It then reviews previous empirical studies on the subject. The final part provides a conclusion of the literature review.

2.1 Theoretical Literature on Remittances and Economic Growth

Theoretical literature focuses on framework in which remittances influences economic growth.

The theory of economic growth falls into three broad groups; early post Keynesian, neo-classical model and endogenous growth model.

2.1.1 Post Keynesian Growth Models

Harrod-Domar (H-D) growth model

Harrod (1939) and Domar (1946) growth model emphasizes the role of savings in growth of output in an economy. The models assume a positive relationship between an economy's saving rate and its rate of output growth and an inverse relationship between capital-output ratio and economic growth as shown in equation 2.1.1

$$\Delta Y/Y = s/k \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 2.1.1$$

Where Y is total output, ΔY is change in total output, s is savings rate and k is capital-output ratio. The gap between the desired and actual level of savings to achieve a targeted level of economic growth can be filled by foreign financial resources among which is

remittances.   Hence, remittances are deemed to enhance economic growth where domestic savings are insufficient.

The Two Gap model

The model was developed by Chenery and Strout (1966). It identifies the foreign exchange gap for a country to be able to finance its imports. The extent of exports and capital transfers determines the import purchasing capacity of an economy. The model is shown in equation 2.1.2

$$\mathbf{g} = \mathbf{s}/\mathbf{k} + \mathbf{b}/\mathbf{k} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \mathbf{2.1.2}$$

Where g is economic growth; s is savings ratio, b is foreign exchange requirement and k is capital output ratio. The level of foreign exchange in developing countries is not enough to finance it imports of expensive capital goods needed for production. This gap can be filled by remittances hence remittances are deemed to affect economic growth positively where foreign exchange is not enough to finance imports.

2.1.2 Neoclassical Growth Models

These models argue that growth in output is caused by one or more of the following three factors; increase in capital through savings and investment, increase in labour quantity and quality through population growth and education respectively and technological change. The classical growth model in this group is the Solow (1956) growth model

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which relates growth in the level of output to two sources; inputs and factor productivity as shown in equation 2.1.3

$$Y = K^{\alpha}(AL)^{1-\alpha} \text{…………………………………………………………..} 2.1.3$$

Where Y is output level; K is both physical and human capital, A is labour productivity; L is labour; α is the elasticity of output with respect to capital and 1-α is the elasticity of output with respect to labour. Transforming the specific link between input and output growth assuming constant return to scale, we have the growth accounting equation as;

$$\Delta Y/Y = \alpha(\Delta K/K) + (1 - \alpha)(\Delta A/A + \Delta L/L) \text{……………………….} 2.1.4$$

Since α is assumed to be less than 1, the model yields diminishing returns to both capital and labour. There's need to increase factor productivity such as through improvement of human capital. Remittances are deemed to increase factor productivity such as through improved health and access to education.

2.1.3 Endogenous Growth Model

The endogenous growth theory assumes a production function with constant marginal product of capital. Unlike the neoclassical assumption of diminishing marginal products, these models postulate long term growth. According to Todaro (2006), open economies tend to converge at higher income levels and their growth is higher compared to closed economies. This is because capital flows from economies where capital-labour ratios are

higher to developing economies where lower capital-labour ratios exist. Consequently, restricting inflows of remittances in developing economies will hinder economic growth. In sum, externalities, human capital and research and development form the main springs of endogenous growth theory.

2.2 Empirical Literature on Remittances and Economic Growth

There are many studies that investigate the direct impact of remittances on economic growth. Other studies analyze the channels remittances influence growth of output. These channels include consumption, investment, financial development, human capital, moral hazard and exchange rate.

2.2.1 Remittances and Economic growth

Several studies have used panel data to investigate the impact of remittances on economic growth. Pradhan et al. (2008) used standard growth model to estimate the impact of workers' remittances on economic growth in a sample of 39 developing countries. The study used panel data for the period 1980-2004. Real per capita is the dependent variable while investment, openness, polity and remittances are the independent variables. They found that the proportion of worker's remittances that was used for investment enhanced economic growth. A 10% increase in the rate of investment led to 24.3% increases in per capita output.

Fayissa and Nsiah (2008) employed a linear Cobb-Douglas production function to analyze panel data for 37 African countries for the period 1980-2004. They investigated

the contribution of remittances to economic growth relative to other factors that influence growth such as FDI, foreign aid, human and physical capital, openness of a country, polity and lagged income. They found that remittances influence on economic growth was positive and significant. A 10% increase in remittances led to 0.3% increase in GDP per capita.

Ziesemer (2011) analyzed the impact of remittances on growth of GDP per capita, savings, public expenditure on education, tax revenue and emigration. The study used data for 52 countries with GDP less than USD 1200 (Base year 2000). The results indicated that remittances have a strong positive relationship with levels of GDP per capita, rate of savings and public expenditure on education. Increase in remittances also reduced tax revenue and emigration which has a direct effect of reducing labor force growth.

Other studies have found mixed results on the impact of remittances on economic growth. Singh et. al. (2010) used panel data of 36 countries for the period 1990-2005 to investigate the determinants and the macroeconomic impact of remittances. Using a standard growth model, they estimated two models; one for determinants of remittances and another for determinants of economic growth. They found that the size and location of the Diasporas were the main determinant of remittances received. Results of the impact of remittances on growth were mixed. Remittances were found to be counter-cyclical with variations in GDP per capita such that they could help mitigate economic shocks. However, a negative co-efficient of remittances was found on growth in all the

sample countries. This implies the positive impact of remittances on economic growth was outweighed by its negative effects.

A recent study by Ahamada and Coulibaly (2013) examined causality between remittances and growth in SSA. They used data for 20 countries that were in the sample used by Singh et. al. (2010). Using granger causality test for panel data in the period 1980-2007, they found that remittances do not affect economic growth nor does economic growth affect remittances inflows. Extending the study to examine the link between remittances and physical output in the 20 countries, they found it was only in Gambia where remittances enhanced physical output and physical output enhanced remittances.

Studies have also analyzed relationship of remittances and economic growth in particular countries using time series econometrics. Siddique et al. (2012) investigated the direction of causality between economic growth and remittances in Bangladesh, India and Sri Lanka for the period 1976-2006. They employed granger causality test and found that the relationships in the three countries were different. In Sri Lanka, economic growth enhanced inflow of remittances and remittances inflows enhanced economic growth. In Bangladesh, inflow of remittances enhanced economic growth but economic growth did not influence inflows of remittances. No causal link between remittances and economic growth was observed in India.

Ikechi and Anayochukwu (2013) investigated the impact of remittances on economic growth of three SSA countries; Ghana, Nigeria and South Africa. The data used covered the period 1980-2010. The control variables included in the estimated equation were; openness, labour force, exchange rate and inflation. The results indicated that remittances enhanced economic growth in all the three countries and the magnitude of the impact varied across the countries. The largest impact was in South African followed by Ghana and the lowest was in Nigeria.

2.2.2 Channels of Remittance that influence Economic growth

Many studies have analyzed channels through which remittances affect economic growth. Remittances can influence growth through consumption. Stahl and Arnold (1986) analyzed the use of international remittances over the period 1980-1985 in Bangladesh, India, Pakistan, Philippine, Sri Lanka and Thailand. The results showed that in all the six countries, a huge proportion of remittances were going to consumption of basic needs which promoted local industries. The increased effective demand led to expansion of domestic production.

Chimhowu et al (2005) analyzed nature and role of remittances in poverty eradication in developing countries. The study found that much of remittances are channeled to consumption of basic needs such as food, child and maternal health, shelter and education. The multiplier effect of consumption increases the aggregate demand and overall output in the economy thus enhancing economic growth of the recipient country. In addition, when remittances proceeds are invested in health and education, they

improve human capital which enhances economic growth for a country in the long run as shown by Olaniyan and Okemakinde (2008).

Lartey (2011) used data for the period 1990-2008 to analyze remittances, investment and growth in 36 SSA countries. Using generalized method of moment, the study tested the relationship between remittances and economic growth. The study also tested whether the impact was through capital accumulation or other mechanisms. The results indicate a positive relationship between remittances and growth and a positive interaction effect between remittances and financial depth on growth. The finding also revealed threshold values for two indicators of financial development, above which the total effect of remittances on growth was positive. They also found two channels in which remittances influenced growth; direct channel of investment and indirect channel of smoothing consumption which led to a stable macroeconomic environment.

Several studies have shown a strong link among remittances, financial development and economic growth. Allen and Ndikumana (2000) showed development in financial development enhanced economic growth by providing loanable funds. Studies have also found remittances can either complement or substitute financial development hence affecting economic growth. Aggarwal et al (2011) used data of 109 countries for the period 1975-2007 to analyze the role of remittances on amount of bank's deposit and credit advanced to the private sector. Even after controlling the problem of endogeneity, they found that remittances had a positive impact both on the level of bank's deposit and credit to the private sector. Remittances were found to complement financial

development hence enhancing economic growth. The impact is higher when formal channels of transfer are used.

Nyamongo et al, (2012) analyzed the role of financial development and remittances on economic growth in 36 SSA countries over the period 1980-2009. Using OLS technique, the study found that remittances and financial development complemented one another. Increased remittances and financial development enhanced growth. However, remittances volatility was negatively related with economic growth.

Adenutsi (2011) examined the linkage between financial sector growth and economic growth in Ghana. Two results emerged from the study. First, although financial development Granger-causes international migrant remittance inflows, it is negatively associated with endogenous growth. Second, international migrant remittance inflows are statistically significant in explaining variations in endogenous growth in the short run as well as in the long run.

Giuliano and Ruiz-arranz (2009) used data for the period 1975-2005 of 73 developing countries to test if the levels of financial depth in the immigrant's country affect the impact of remittances on economic growth. The study found that the marginal impact of remittances on economic growth was decreasing with financial development (increased deposit to GDP ratio). By alleviating credit constraints, they enhanced economic growth. Thus, where financial sector is not fully developed, remittances act as a substitute for lack of capital development fund.

Remittances have been found to be a source of foreign exchange that can be used to finance investment capital which enhances growth. Ekanayake and Mihalis (2008) used panel least square estimation technique to estimate the impact of remittances and FDI on economic growth of 66 developing countries for the period 1980-2006. To account for differences in income level, the study also estimated separate growth model for high income, middle income and low income countries. The results showed a positive impact of remittances on economic growth. Apart from low income countries, the impacts were significant.

A study related to that of Ekanayake and Mihalis (2008) was carried out by Balde (2011) on 34 countries in SSA using Ordinary Least Square (OLS) for the period 1980-2004. The study tested the impact of remittances and foreign aid on savings and investment. Both remittances and foreign aid had positive and significant impact on the level of savings and investment. Harrod (1939) and Domar (1946) have shown savings and investment enhance economic growth. This shows that remittances channeled to savings and investment enhanced economic growth.

Remittances have been found to create moral hazards in an economy which can adversely affect growth. Chami et al. (2003) developed a model to examine the motivation for remittances and effect of remittances on economic activity. Using aggregate panel data of 133 countries for 29 years over the period 1970-1998, they found that remittances are compensatory in nature. Due to information asymmetry between the immigrants and

recipients of the remittances, the later may decide to engage in voluntary unemployment. This may cause high wages leading to increased cost of production and low output growth. Remittances need be transformed from compensatory transfer to investment for it to enhance growth.

There is also some evidence that remittances can influence output through changes in real exchange rates. Acosta et al (2009) analyzed the impact of remittances on real exchange rate in El Salvador. In this small open economy, remittances as a proportion of GDP were at 18.7% in 2007. Using a Bayesian VAR technique, they found that remittances inflows led appreciation of domestic currency, increase in household income and consumption that was biased towards non-tradable. There was increase in imports, decrease in exports with a net effect of fall in aggregate domestic demand causing lower economic growth.

Similar results were found by Amuendo-Dorantes and Pozo (2004) in the study of 13 Latin American and Caribbean countries. They tested the effect of remittances on the real exchange rate and found that remittances appreciated the real exchange rate with an elasticity of about 0.22. Appreciation of domestic currency lowers a country's competitive edge, leading to low export which leads to low output.

2.3 Overview of Literature Review

Existing empirical literature on the effect of remittances on economic growth is inconclusive. Some studies investigate direct relationship between remittances and economic growth where others have focused on channels in which remittances influence

economic growth. Those studies which have found remittances enhancing economic growth have attributed it to development of financial sector, increased human and physical capital and multiplier effect of consumption. On the other hand, those who have found remittances affecting economic growth negatively have attributed it to moral hazard and appreciation of domestic currency which affects domestic production negatively.

Previous studies have also tended to focus more on a broad group of developing countries or a group of countries constituting a region such as SSA. They have used panel data where one co-efficient on remittances is used as a measure of the impact on growth for all countries. Using one co-efficient to measure the impact of several countries may not bring out well the impact to a specific country like Kenya due to differences on domestic institution, polity and income levels.

Majority of the time series studies used sample size of less than 30 years due to lack of data. This means fewer degrees of freedom leading to low level of accuracy on estimated parameter. This paper therefore undertook a case study of a specific country, Kenya to find the impact of remittances on economic growth taking into account various control variables using long time series data for the period 1970-2012.

CHAPTER THREE

METHODOLOGY

This Chapter presents the methodology used to analyze the relationship between remittance and economic growth in Kenya. Specifically, 3.1 presents conceptual framework, section 3.2 is empirical model, section 3.3 defines variables and their measurement and Section 3.4 presents the sources of data and the sample size. Finally, Section 3.5 describes the estimation technique and diagnostic tests.

3.1 Conceptual Framework

This study used production function framework to study the impact of international remittance inflows on economic growth in Kenya. The framework is similar to that used by Fayissa and Nsiah (2008), Ziesemer (2011), Siddique et al. (2012) and Ikechi and Anayochukwu (2013). Production functions show the relationship between outputs and physical inputs with a particular technology.

Mathematically, the general form of a production function is represented as;

$$Y = f\left(K, L, A, M, \gamma, \theta\right) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.\dots\dots\dots.3.1.1$$

Where Y is output, K is capital, A is land, M is materials, γ is returns to scale and θ is the coefficient parameter. The production function gives the technically feasible output when production is efficient.

International remittances can affect gross domestic product (GDP), in a number of ways. International remittances can be used for consumption and investment (in health, education and physical capital) purpose and hence enhance economic growth. Second, international remittances affect the level of deposits in commercial banks and therefore provide source of loanable funds. Thus, remittances enhance financial development which has been found to be good for economic growth. Third, remittances can create moral hazard and appreciation of domestic currency which hinders economic growth.

3.2 Empirical Model

From the foregoing discussion and the review of the literature, the effect of international remittances on the GDP can be represented as follows;

$$GDP = f(REM, OPN, FIN, GFCF, CPI, HC) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots .3.2.1$$

Where GDP is gross domestic product, REM is international remittances, OPN is openness to international trade, FIN is financial development, GFCF is gross fixed capital formation, CPI is consumer price index and HC is human capital.

GFCF was included because economic theory identifies it as a key determinant of economic growth (Harrod, 1939 and Domar, 1946). CPI measures price level and is included to capture macroeconomic stability (Fischer, 1993 and Modigliani and Miller, 1958). HC captures quality of labour force in form of secondary school enrolment (Behrman and Wolfe, 1983). FIN was included because growth literature shows that it

plays a key role in economic growth by providing loanable funds (Allen and Ndikumana, 2000). Openness was included because it affects competitive advantage, technology and efficiency in production (Ayanwale, 2007).

Equation 3.2.1 shows the effect of remittances on GDP holding the effects of other independent variables constant. Because the effects of independent variables in 3.2.1 are likely to be non-linear, a Cobb-Douglas production function of the following form was adopted

$$\mathbf{GDP_t} = \boldsymbol{\beta_0} . \mathbf{REM_t^{\beta 1} FIN_t^{\beta 2} OPN_t^{\beta 3} CPI_t^{\beta 4} GFCF_t^{\beta 5} HC_t^{\beta 6} \boldsymbol{\varepsilon_t}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots. \mathbf{3.2.2}$$

Taking logarithms on both sides of equation 3.2.2, a log-log model is obtained. This can be written as;

$$\mathbf{LNGDP_t = LN\beta_0 + \beta_1 LNREM_t + \beta_2 LNFIN_t + \beta_3 LNOPN_t + \beta_4 LNCPI_t}$$
$$\mathbf{+ \beta_5 LNGFCF_t + \beta_6 LNHC_t + \varepsilon_t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots \mathbf{..2.3}$$

Where LN is the natural logarithm, $\boldsymbol{\beta_0}$ is the intercept term, $\boldsymbol{\beta_1}, \ldots, \boldsymbol{\beta_6}$ are slope coefficients. They show the degree of responsiveness of GDP to changes in independent variables. $\boldsymbol{\varepsilon}$ is the disturbance term while *t* denotes time.

3.3 Definition of Variables and their Measurement

This subsection considers the definition and selection of variables used in the analysis. In addition, it discusses measurement of the variables and expected signs of their estimated coefficients.

LNGDP is the dependent variable. It is the natural logarithm of the sum of gross value added by all resident producers in the economy plus any product taxes minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

LNREM is defined as the natural logarithm of current transfers by migrant workers and wages and salaries earned by nonresident workers (WB, 2014). Remittances are classified as current private transfers from migrant workers who are residents of the host country to recipients in their country of origin. This data is only for remittances channeled through formal means. It consists of three categories; Worker's remittances (current transfers to non-residents), employees' compensation and migrants' transfers which arise from individuals' change of residence. It is recorded as a percentage of GDP. This is the variable of interest and its impact can either be positive or negative depending on the overall strength of microeconomic aspects of the effect of remittances as discussed in literature review.

LNOPN is the natural logarithm of international share in GDP. That is the ration of the sum of exports and imports to GDP of a country. Trade openness is a measure of how open a country is to the rest of the world and is a proxy of globalization. According to

Ayanwale (2007), it affects realization of competitive advantage, access to new technology and enhances efficiency through competition. Openness to trade is expected to affect economic growth positively and previous study by Miller and Upadhyay (2000) supported this hypothesis.

LNCPI is the natural logarithm of consumer price index and the first difference yield inflation rate. Changes in CPI capture the rate at which the general price of goods and services is rising. This will act as a proxy for macroeconomic stability in the country. Fischer (1993) and Modigliani and Miller (1958) found that firms and workers devote productive resources to deal with inflation. They further note that inflation uncertainty reduces efficiency by discouraging long-term contracts and increasing relative price and thus acts as a disincentive to investors. Consequently, LNCPI is expected to affect economic growth negatively. Previous studies by Barro (1995) and Chimobi (2010) support this hypothesis.

LNRFIN is natural logarithm of domestic credit to the private sector by commercial banks. It's an indicator of financial development. Domestic credit to private sector by banks refers to financial resources provided by deposit taking corporation except central bank to the private sector, such as through loans, purchases of non-equity securities and trade credits and other accounts receivable that establish a claim for repayment, (WB, 2014). This will acts as the proxy of liquidity. Economic theory shows that increased liquidity crowds in investment which enhances growth positively, (Romer, 1996). Consequently, the expected sign is positive (Allen and Ndikumana, 2000).

LNHC is the natural logarithm of secondary school enrollment as reported in Kenya economic surveys. It is an indicator of human capital. Neoclassical growth function recognizes labour as a key factor of production. In addition, growth is enhanced through improved quality of labour. Secondary school enrollment improves the quality of education hence it is expected to influence economic growth positively (Behrman and Wolfe, 1983).

LNGFCF is the natural logarithm of gross fixed capital formation. According to Domar (1946), accumulation of physical capital is a pre-requisite for any economic growth to be realized. It determines the potential level of GDP of a country. Gross fixed capital formation is expected to enhance economic growth.

3.4 Sources of data

The data source for this paper is World Development Indicators (WDI) data base for all variables except secondary school enrollment. WDI is a dataset compiled by World Bank and is used by many researchers. It's compiled from officially recognized international sources. Secondary school enrollment data was retrieved from Kenya's economic surveys (various issues). The sample size of the study is 1970 to 2012 since most of the variables do not have data for periods prior 1970.

3.5 Estimation Technique

Time series data may be stationary or non-stationary. OLS regressions on non-stationary data may give spurious results (Gujarati, 2005). On the other hand, Granger (1988) showed that a linear combination of non-stationary series may lead to a series which is stationary (cointegrated) and a long run relationship exist between them. Therefore, it was vital to explore the characteristic of the data first in term of normality, stationarity and cointegration.

3.5.1 Unit Root Test for Non-Stationarity

The first step was to determine if the variables are stationary or non-stationary. Stationarity implies that the mean and variance of a series are constant over time and that its covariance depends only on the gap between the two time periods and not on time (Gujarati, 2005). Augmented Dickey- Fuller (ADF) test, which is a test against the null hypothesis that there is a unit root, was used. ADF test is superior to Dickey Fuller (DF) test because the DF may have auto correlated errors (Gujarati, 2005).The ADF test regression equation to test unit root in time series Y_t is given as;

$$\Delta Y_t = \alpha + \delta Y_{t-1} + \sum_{i=1}^{n} \theta_i \, \Delta Y_{t-1} + \beta T + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.3.5.1$$

The null hypothesis is Ho: $\delta = 0$ and alternative hypothesis is Ha: $\delta < 0$. If the computed ADF test statistic is greater than the ADF critical at a given level of significance, then null hypothesis of non stationarity is rejected. If computed ADF test statistic is less than

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ADF critical statistic at a given level of significance, then null hypothesis on non stationarity is accepted. If non stationary in levels, the series are differenced once and if stationary, they are said to be integrated of order one, I (1).

3.5.2 Cointegration Test

In order to determine whether the variables have a long run relationship among themselves, the Johansen cointegration test was used. This test allows more than one cointegrating relationship. Johansen test is of two types; with maximum eigenvalue or trace tests (Johansen, 1988). The maximum eigenvalue value tests the null hypothesis of *r* cointegrating vector against the alternative hypothesis of *r+1*. The trace tests the null hypothesis of *r* cointegrating vectors against the alternative hypothesis *n* cointegrating vector. Presence of cointegration implies that we run the error correction model to correct for the short term disequilibrium as the variables move towards long run equilibrium.

If Y_t and X_t are cointegrated, by definition, the error term obtained from regressing Y_t on X_t is stationary. Thus we can express the relationship between Y_t and X_t with an error correction model (ECM) specification as:

$$\Delta Y_t = \beta_0 + \theta_1 \Delta X_t - \alpha \varepsilon_{t-1} + \mu_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \ 3.5.2$$

This will have the advantage of including both long run and short-run information. In this model, θ_1 is the short-run effect that measures the immediate impact that a change in X_t

will have on a change in Y_t. In contrast, α is the feedback effect, or the adjustment which shows the extent towards the equilibrium relationship between the variables.

3.6 Diagnostic tests

The analysis of the data was carried out by Ordinary Least Squares (OLS) method. It was necessary to conduct the following tests to ensure that the OLS assumptions are met and the estimates are unbiased, efficient and consistent. Where these were violated, corrective measures were adopted.

3.6.1 Normality of the Disturbance Term

OLS assumes that the error term is normally distributed around zero mean and constant variance. When this normality is not observed, the OLS estimates are still Best Linear Unbiased Estimates (BLUE), but we cannot assess their statistical reliability by the classical tests of significance. The Jarque-Bera (JB), test was employed to test the normality. Its null hypothesis is the random variable series is normally distributed.

3.6.2 Multicollinearity of the Explanatory Variable

Multicollinearity refers to a linear relationship among some or all explanatory variables of a regression model. In the presence of imperfect but high multicollinearity, estimation of the regression coefficient may be possible but with large standard error. If multicollinearity is perfect, regression coefficient are indeterminate with infinite standard errors. Multicollinearity becomes a serious problem if the pair-wise or zero-order

correlation coefficient between two regressors is in excess of 0.8, (Gujarati, 2005). An explanatory variables correlation matrix was estimated to assess the degree of multicollinearity in the regression equation.

3.6.3 Autocorrelation of the Disturbance terms

This refers to correlation of a time series with its own past or future values. OLS technique assumes there is no or auto-correlation in the error terms entering the regression functions. If autocorrelation is present, estimates are still linear, consistent, unbiased, asymptotically normally distributed but inefficient. They do not have minimum variance among all linear unbiased estimators. The Breusch- Godfrey (BG) Lagrange Multiplier (LM) test was used to test for autocorrelation. The null hypothesis of the test is that there is no auto correlation.

3.6.4 Correct Specification of the Model

The goal of OLS is to closely fit a function with data through minimizing sum of squared residuals. For OLS estimates to be consistent and unbiased, the regression model must be correctly specified. Specification errors arise from inclusion of an unnecessary variable(s), omission of relevant variable(s), errors of measurement, adopting wrong functional form or incorrect specification of the stochastic error term. To test for correct specification of the model, the Ramsey Regression Specification Error Test (RESET) was used. The null hypothesis of the test is that the model is correctly specified.

3.6.5 Auto-Regressive Conditional Heteroskedasticity (ARCH)

ARCH occurs when the error term variance is related to the squared error term in the previous period. ARCH in itself does not invalidate standard OLS inference. However, ignoring ARCH effects may result in loss of efficiency. To test for the presence of ARCH, ARCH LM test was employed. The null hypothesis of the test is that that there is no ARCH.

4.1 Introduction

This chapter presents the descriptive statistics and econometric results of the study. It also provides their economic and statistical implications.

4.2 Descriptive Statistics and Time Series Properties of the Variables Used

To ensure the variables used are normally distributed and no outliers exist, normality test was done using the Jarque-Bera test statistic. It reports both kurtosis as well as skewness. Normal distributed series has a skewness that ranges from -2 to 2 while kurtosis ranges between -3 and 3. For normality test, null hypothesis of normality is tested against the alternative hypothesis of non-normality.

Table 4.1 Descriptive Statistics and Normality Test Results

	LNGDP	LNREM	LNOPN	LNFIN	LNGFCF	LNHC	LNCPI
Mean	26.175	21.847	-0.511	24.664	24.505	13.227	2.401
Median	26.136	21.951	-0.531	24.524	24.477	13.335	2.343
Maximum	28.856	25.354	-0.293	27.859	27.276	14.457	4.826
Minimum	23.162	17.764	-0.740	21.272	21.536	11.751	-0.113
Std. Dev.	1.726	2.475	0.122	1.921	1.685	0.662	1.563
Skewness	-0.136	-0.216	0.061	-0.058	-0.072	-0.339	-0.099
Kurtosis	1.746	1.584	2.072	1.801	1.795	2.867	1.679
Jarque-Bera (p-value)	2.948 (0.229)	3.927 (0.140)	1.570 (0.456)	2.601 (0.272)	2.641 (0.267)	0.854 (0.652)	3.199 (0.202)
Observations	43	43	43	43	43	43	43

Source; Own calculation using E-views

Table 4.1 gives the descriptive statistics of variables used in this study. The p-values of the J-B test statistic exceed conventional levels of significance (1%, 5% and 10%).

Therefore, the normality test does not reject the null hypothesis of normality so all variables are normally distributed.

4.3 Time Plots of Variables used in the Study

Appendix figure A1, shows time plots of dependent and independent variables. The objective was to determine the trend if any and gain insight into whether or not they are stationary. At levels, all variables except LNOPN and LNCPI seemed to have a drift and upward trend. LNOPN seemed to have adrift only while LNCPI had a trend only. After first differencing, all variables; ΔLNGDP, ΔLNREM, ΔLNFIN, ΔLNGFCF, ΔLNCPI, ΔLNOPN and ΔLNHC appear stationary. Test of non stationarity using ADF were used to confirm stationarity. The results are presented in section 4.4.

4.4 Tests of Non stationarity Hypothesis

Table 4.2 presents the ADF tests for the variables LNGDP, LNREM, LNOPN, LNFIN, LNGFCF, LNCPI and LNHC. The null hypothesis of the ADF tests is that as series has a unit root. The ADF tests were applied with a drift (constant) only and with drift and trend

From the results of the ADF tests, the variables LNGDP, LNREM, LNPI and LNHC were found to be non stationary both with drift and with drift and trend at 10% level of significance. LNOPN was found to be stationary with drift only at 10% but non-stationary with drift and trend. LNFIN and LNGFCF were found to be non stationary with drift but stationary with drift and trend at 10% level of significance.

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Table 4.2 ADF unit root test statistics

Variable	Drift					Drift and Trend				
	ADF Statistic	Critical values			P values	ADF Statistic	Critical values			P values
		1% level	5% level	10% level			1% level	5% level	10% level	
LNGDP	-1.65	-0.36	-2.93	-2.61	0.45	-1.62	-4.20	-3.52	-3.19	0.77
LNREM	-0.80	-3.60	-2.93	-2.61	0.79	-2.00	-4.19	-3.52	-3.19	0.59
LNOPN	-2.84	-3.60	-2.93	-2.61	0.06	-2.83	-4.19	-3.52	-3.19	0.20
LNFIN	-0.08	-3.60	-2.93	-2.61	0.81	-3.27	-4.19	-3.52	-3.19	0.09
LNGFCF	-0.79	-3.60	-2.93	-2.61	0.81	-3.28	-4.20	-3.52	-3.19	0.08
LNCPI	-0.98	-3.60	-2.94	-2.61	0.75	-2.26	-4.19	-3.52	-3.19	0.45
LNHC	-1.49	-3.60	-2.93	-2.61	0.53	-2.26	-4.19	-3.52	-3.19	0.45

Source; Own calculation using E-views

Since all variables were found to be non stationary at 5% level of significance, they were all differenced once. The ADF tests results presented in Table 4.3 shows that all the time series are stationary at first difference. This means the variables are all integrated of order one I (1).

Table 4.3 ADF unit root at first difference

| Variables | Drift | | | | | Drift and Trend | | | | |
	ADF Statistic	Critical values				ADF Statistic	Critical values			
ΔLNGDP	-1.65	-0.36	-2.93	-2.61	0.45	-1.62	-4.20	-3.52	-3.19	0.77
ΔLNREM	-0.80	-3.60	-2.93	-2.61	0.79	-2.00	-4.19	-3.52	-3.19	0.59
ΔLNOPN	-2.84	-3.60	-2.93	-2.61	0.06	-2.83	-4.19	-3.52	-3.19	0.20
ΔLNFIN	-0.08	-3.60	-2.93	-2.61	0.81	-3.27	-4.19	-3.52	-3.19	0.09
ΔLNGFCF	-0.79	-3.60	-2.93	-2.61	0.81	-3.28	-4.20	-3.52	-3.19	0.08
ΔLNCPI	-0.98	-3.60	-2.94	-2.61	0.75	-2.26	-4.19	-3.52	-3.19	0.45
ΔLNHC	-1.49	-3.60	-2.93	-2.61	0.53	-2.26	-4.19	-3.52	-3.19	0.45

Source; Own calculation using E-views

4.5 Test of Cointegration Hypothesis

The problem of non stationary time series is solved by differencing the series successively until stationarity is achieved to avoid spurious results. However, applying differenced data leads to loss of long run properties of macroeconomic variables (Gujarati, 2005). However, if the series are non stationary but cointegrated, it is possible to combine both short run and long run properties of the data by finding a linear relationship for two or more series. In this study, the Johansen cointegration tests were used. The results of the trace test and maximum eigenvalue tests are reported in Tables 4.4 and 4.5.

Cointegration relationship exists among the variables when the trace statistic and maximum eigenvalue statistics are greater than critical values. The null hypothesis is no rank and hence no cointegration. Table 4.4 and 4.5 shows the value of r is 2 hence null hypothesis was rejected. The results indicate that there are at least two co integrating relationships among the variables. This calls for an error correction model to estimate the dynamic relationship.

Table 4.4 Johansen and Juselius Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Critical value (0.05%)	Prob.
None *	0.744938	156.4689	111.7805	0
At most 1 *	0.651758	100.4526	83.93712	0.002
At most 2	0.517006	57.2034	60.06141	0.0851
At most 3	0.263327	27.36565	40.17493	0.5034
At most 4	0.251352	14.83558	24.27596	0.4686
At most 5	0.067254	2.966647	12.3209	0.8518
At most 6	0.002731	0.112116	4.129906	0.7829
Trace test indicates 2 cointegrating equations at the 0.05 level				

Source; Own calculation using E-views

Table 4.5 Johansen and Juselius Cointegration Rank Test (Maximum-Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen statistic	Critical value (0.05%)	Prob.
None *	0.744938	56.01626	42.77219	0.001
At most 1 *	0.651758	43.24922	36.63019	0.0073
At most 2	0.517006	29.83775	30.43961	0.0593
At most 3	0.263327	12.53007	24.15921	0.735
At most 4	0.251352	11.86894	17.7973	0.3099
At most 5	0.067254	2.854531	11.2248	0.8099
At most 6	0.002731	0.112116	4.129906	0.7829
Max-eigenvalue test indicates 2 cointegrating equations at the 0.05 level				

Source; Own calculation using E-views

4.6 Error Correction Model (ECM)

Since the variables are co-integrated, they move together in the same direction. ECM was therefore estimated to correct the short run disequilibrium as the variable moves toward the static long run equilibrium. The parameter estimates of the dynamic short run relationship for ECM are presented in Table 4.6.

Before interpreting the results, the study examined the diagnostic tests of the estimated model. Appendix Table A2 shows that the highest absolute correlation co-efficient was 0.353. This mean there is no multicollinearity as the correlation co-efficient is less than 0.8 (Gujarati, 2005). As shown in Table 4.6 the Breusch-Godfrey test did not reject the null hypothesis of no serial autocorrelation. Ramsey Reset test of the null hypothesis of no misspecification of the model could not be rejected at 10% level of significance as well. In addition, the null hypothesis of no ARCH effect could not be rejected

Table 4.6 Estimates of the Error Correction Model, 1970-2012 (Dependent Variable is ΔLNGDP)

Variable	Coefficient	t-Statistic	Prob.
Constant	0.017	0.850	0.401
ΔLNCPI	0.452*	4.430	0.000
ΔLNFIN	0.154***	1.803	0.080
ΔLNGFCF	0.235**	2.692	0.011
ΔLNHC	0.071	0.739	0.465
ΔLNOPN	-0.263*	-3.593	0.001
ΔLNREM	0.035	1.526	0.136
ECT	-0.838*	-4.760	0.000

No of Observations   42
R-squared   0.590
Adjusted R-squared   0.506
Overall F-statistic   6.990, (p-value; 0.000)
Durbin- Watson   1.749
B-G pagan   2.610, (p-value; 0.106)
Ramsey reset   0. 510 (p-value; 0.677)
Arch   0.015 (p-value; 0.902)

*, ** and *** denote significant at 1%, 5% and 10% respectively

Source; Own calculation using E-views

From the results, R-squared is 0.590 implying that 59.0% of the variations in growth of GDP are explained by changes in the six explanatory variables in the model.

The co-efficient of error correction term (ECT) is equal to -0.838 and is statistically significant at 1%. The sign conforms to the restriction of negativity and less than one (Gujarati, 2005). It also implies that the rate at which short runs disequilibrium is being corrected to arrive to the long run equilibrium is 83.8% per annum. This is a high speed

of convergence. The difference of 16.2% may be associated with rigidity of getting immediate impacts of some variables especially on education.

The estimated coefficient of ΔLNREM is positive but statistically insignificant even at 10% level of significance. The results show that holding all other factors constant, a one percentage increase in remittances leads to 0.035 percentage point increase in ΔLNGDP. The sign of the effect is in tandem with classical growth model which predicts that remittances increase GDP growth. The sign of the effect is also in line with findings of authors such as Stahl and Arnold (1986), Ziesemer (2011) and Ikechi and Anayochukwu (2013).However, this contrasts finding of Singh et al. (2010) who found a negative coefficient of remittances on economic growth.

Inflation which is an indicator of macroeconomic stability is positively related to GDP growth. The estimated coefficient of ΔLNCPI is positive and statistically significant at 1% level of significance. A one percentage point increase in inflation (ΔLNCPI), leads to 0.452 percentage point increase in ΔLNGDP. This finding is in tandem to Pollin and Zhu (2005). However, it is in contrast with finding by Barro (1995) and Chimobi (2010).This shows that sound expansionally monetary policy moves in the same direction with increase in GDP.

Financial development, proxied by domestic credit to the private sector by commercial banks (ΔLNFIN) has a positive and significant impact on GDP at 10% level of significance. A one percentage point increase in financial development (ΔLNFIN), leads

to 0.154 percentage point increase in ΔLNGDP. This supports finding of Allen and Ndikumana (2000) and Hassan et al. (2011). Development of financial sector help in providing loanable fund for investment purposes which enhance GDP growth.

The estimated coefficient of gross fixed capital formation (ΔLNGFCF) is positive and significant at 5% level of significance. A one percentage point increase in gross fixed capital formation (ΔLNGFCF), leads to 0.452 percentage point increase in ΔLNGDP. This conforms to both post Keynesian and neoclassical growth models which emphasize the great role that capital formation play in increasing the potential level of an economy. The findings are also in tandem with Ugochukwu (2013).

Openness of the economy is usually advocated as a way to enhance growth (Ayanwale, 2007). The coefficient of openness (ΔLNOPN) is negative and significant at 1% level of significance. A one percentage point increase in openness (ΔLNOPN), leads to 0.263 percentage point decrease in ΔLNGDP. This finding contradicts to a recent study by Abala (2014) who found a positive significant impact of openness on GDP growth in Kenya. This may be attributed to assumption of a linear production function by Abala (2014). The negative co-efficient can be attributed to poor term of trade. Kenya imports expensive machineries and its export is usually low value added.

Human capital, proxied by secondary school enrolment (ΔLNHC) had a positive but insignificant impact on GDP even at 10% level of significance. A one percentage point increase in human capital (ΔLNHC), leads to 0.071 percentage point increase in

ΔLNGDP. These findings are in tandem with Were (2001) on the impact of primary school education on economic growth in Kenya. This insignificance may be linked to lags in realization of education's benefits.

CHAPTER FIVE

SUMMARY AND CONCLUSION

5.1 Introduction

This chapter commences with a summary and conclusion of the study. It then gives policy implications of the study based on findings of chapter four. The final part provides implication for future research based on results of this study as well as previous studies.

5.2 Summary and Conclusion of the Study

Volume of remittances has grown significantly for the sample period. Remittances as a percentage of GDP grew from 0.45% in 1970 to 3.01% in 2012. Remittances can enhance economic growth through financial development, source of investment capital, foreign exchange and multiplier effect of consumption. Remittances can also affects economic growth negatively through moral hazard and appreciation of domestic currency

The research problem of the study was to find if remittances enhances economic growth in Kenya. Consequently, the objective of the study was to investigate empirically the relationship between economic growth and remittances in Kenya and give policy recommendation based on the findings. Time series data for the period 1970-2012 were collected from WDI and Kenya's economic survey. The study employed aggregate production function approach to consider possible effect of remittances, financial development, openness, gross fixed capital formation, consumer price index and human capital on economic growth.

All the variables were found to be normally distributed. Non stationarity tests were done using ADF tests and all variables were found to be integrated of order one. The Johansen test approach was used to test for cointegration and a long run relationship was found to exist. The OLS technique was used for estimation after ensuring that none of the assumption that underlies its assumption was violated. An ECM was used to examine short runs dynamics and correct for short run disequilibrium.

An increase in remittances inflows in the short run increases growth of GDP. However, the effect is insignificant. Increase in consumer price index and financial development in the short run increases growth of GDP significantly. Gross fixed capital formation is also positively and significantly related to economic growth. Higher secondary school enrollment, a proxy for human capital development had a positive but insignificant effect on economic growth. The degree of openness to trade had a significant negative effect on economic growth. Short run disequilibrium was being corrected to arrive at the long run equilibrium at high speed of convergence, (83.8%) per annum.

5.3 Implications of the Study

Improved financial development need be enhanced to accelerate economic growth in Kenya. Credit to private sector provides funds for investment. Policies which boost the level of credit to the private sector should be encouraged. These may includes competition among commercial banks, licensing of more deposit -taking microfinance institutions and allowing licensing of communication industry to offer financial services. International remittances inflows which literature has found to improve financial development should also be promoted.

Gross fixed capital formation should be enhanced in Kenya. The investments being done on infrastructure such as roads and energy should be maintained. They increase the level of capital stock which enhances growth. Policies should also be put to ensure much of international remittances received are channeled to investment purposes. This may include subsidies.

5.4 Implication for Future Research

Data for remittances used in this study did not include through informal channels. WB (2011) estimated the magnitude of remittances channeled through informal channel to be at least double the recorded figure. Consequently, a study that incorporates both formal and informal remittances is recommended.

Secondly, economic growth is not a good measure of standard of living. An analysis on the end use of remittances especially on poverty eradication, health and education is recommended.

Thirdly, there is need to analyze the relationship among external sources of funds; international remittances, foreign aids and foreign direct investment to find out if they are complement or substitutes to one another. With these findings, the government is to able to make better policies on area that it needs advocates with its limited resources to enhance growth.

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APPENDICES

Table A1. International Migrants by Major Region; 1990 and 2010

	No. of International Migrants in Millions					International Migrants as a percentage of population	
Region /Year	**1990**	**1995**	**2000**	**2005**	**2010**	**1990**	**2010**
Asia	50.9	48.8	51.9	55.1	61.3	1.6	1.5
Europe	49.4	54.7	57.6	64.4	69.8	6.9	9.5
North America	27.8	33.6	40.4	45.6	50	9.8	14.2
Africa	16	17.9	17.1	17.7	19.3	2.5	1.9
Latin America & Caribbean	7.1	6.2	6.5	6.9	7.5	1.6	1.3
Oceania	4.4	4.7	5	5.5	6	16.2	16.8
World	155.5	166	178.5	195.2	213.9	2.9	3.1

Source: United Nations, (2014). Trends in International Migrant Stock: The 2008 Revision

Table A2. Pairwise Correlation

Variable	ΔLNREM	ΔLNOPN	ΔLNFIN	ΔLNGFCF	ΔLNCPI	ΔLNHC
ΔLNREM	1.000	0.269	0.211	0.266	0.112	-0.238
ΔLNOPN	0.269	1.000	0.078	0.313	0.353	-0.248
ΔLNFIN	0.211	0.078	1.000	0.353	0.090	0.182
ΔLNGFCF	0.266	0.313	0.353	1.000	0.172	0.012
ΔLNCPI	0.112	0.353	0.090	0.172	1.000	-0.242
ΔLNHC	-0.238	-0.248	0.182	0.012	-0.242	1.000

Source; Own calculation using E-views

Table A3. Data used in Analysis

YEAR	LNGDP	LNREM	LNOPN	LNFIN	LNGFCF	LNCPI	LNHC
			Data				
1970	23.162	17.764	-0.503	21.272	21.536	-0.113	11.751
1971	23.265	17.764	-0.449	21.518	21.782	-0.113	11.855
1972	23.435	18.411	-0.592	21.632	21.910	-0.113	11.995
1973	23.589	18.293	-0.579	21.868	22.002	0.069	12.071
1974	23.778	18.697	-0.293	22.062	22.123	0.233	12.185
1975	23.899	18.390	-0.441	22.146	22.300	0.408	12.330
1976	24.093	18.232	-0.443	22.311	22.483	0.516	12.544
1977	24.340	18.846	-0.407	22.597	22.777	0.655	12.676
1978	24.437	19.134	-0.391	22.909	23.053	0.811	12.798
1979	24.565	18.779	-0.556	23.003	22.913	0.888	12.859
1980	24.711	19.142	-0.424	23.188	23.014	1.018	12.946
1981	24.851	20.382	-0.442	23.290	23.169	1.127	12.925
1982	24.975	20.426	-0.541	23.387	23.316	1.315	12.991
1983	25.100	20.466	-0.613	23.456	23.392	1.423	13.110
1984	25.215	20.523	-0.531	23.553	23.452	1.521	13.127
1985	25.337	20.804	-0.590	23.693	23.580	1.643	12.988
1986	25.489	20.556	-0.584	23.845	23.862	1.668	13.036
1987	25.600	20.806	-0.740	23.908	23.971	1.751	13.166
1988	25.722	21.030	-0.694	24.058	24.135	1.867	13.200
1989	25.861	21.329	-0.632	24.212	24.225	1.996	13.370
1990	26.004	21.884	-0.562	24.325	24.426	2.160	13.335
1991	26.136	21.951	-0.587	24.524	24.477	2.343	13.328
1992	26.301	22.032	-0.636	24.794	24.504	2.584	13.352
1993	26.533	22.648	-0.317	24.846	24.758	2.963	13.183
1994	26.716	22.764	-0.339	25.099	25.049	3.216	13.337
1995	26.866	23.454	-0.332	25.505	25.323	3.231	13.357
1996	27.257	23.525	-0.557	25.721	25.425	3.316	13.397

YEAR	LNGDP	LNREM	LNOPN	LNFIN	LNGFCF	LNCPI	LNHC
1997	27.370	23.751	-0.615	25.952	25.498	3.424	13.441
1998	27.469	23.768	-0.715	26.034	25.616	3.489	13.460
1999	27.533	24.136	-0.730	26.202	25.675	3.545	13.494
2000	27.598	24.436	-0.629	26.236	25.809	3.640	13.540
2001	27.651	24.489	-0.581	26.268	25.945	3.696	13.545
2002	27.666	24.253	-0.595	26.307	25.908	3.715	13.565
2003	27.755	24.433	-0.614	26.368	25.912	3.809	13.691
2004	27.873	24.617	-0.520	26.569	26.057	3.919	13.739
2005	27.979	24.192	-0.439	26.637	26.302	4.017	13.753
2006	28.115	24.440	-0.432	26.773	26.459	4.152	13.816
2007	28.237	24.495	-0.439	26.925	26.596	4.245	13.998
2008	28.377	24.555	-0.366	27.165	26.738	4.478	14.078
2009	28.496	24.612	-0.488	27.294	26.866	4.566	14.221
2010	28.575	24.718	-0.395	27.480	26.974	4.605	14.346
2011	28.745	25.142	-0.306	27.756	27.135	4.736	14.403
2012	28.856	25.354	-0.321	27.859	27.276	4.826	14.457

Source; LNGDP, LNREM, LNFIN, LNOPN, LNCPI, LNGFCF from World

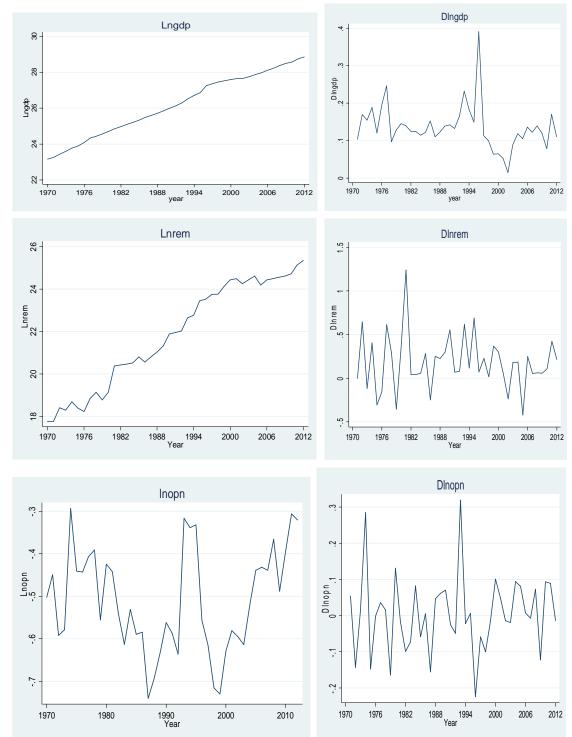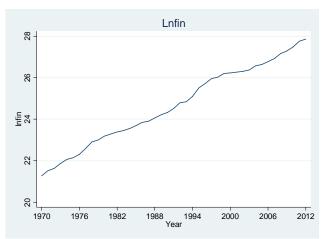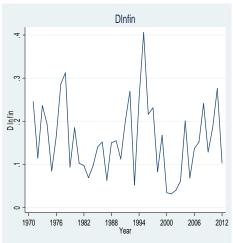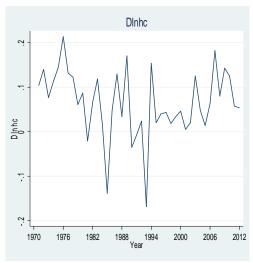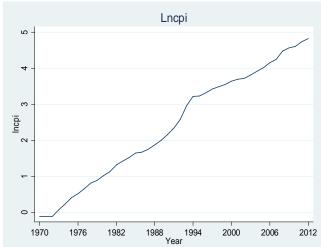Development Indicator and HC from Kenya Economic survey, various issues

Figure A1. Graphical Presentation of Data in Level and First Difference

Conti. Figure A1