EFFECT OF EXTERNAL FINANCIAL INFLOWS ON ECONOMIC GROWTH IN KENYA

BY

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DECLARATION

I declare that this dessertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no materials written or published by other people except where due references is made and author duly acknowledged.

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I do hereby confirm that I have examined the master's research project of

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And have approved it for examination.

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Dissertation supervisor.

DEDICATION

To my wife Nafula, daughters Imani, Lulu and Wema for their patience, love, understanding and inspiration throughout this period.

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I thank God almighty for the good health, the grace accorded to me throughout my studies.

I acknowledge my Supervisor, Dr. Christine Nanjala Simiyu for giving me the required guidance and advice leading to the fruition of this proposal.

ABSTRACT

The purpose of this study was to investigate whether external financial inflows had a positive or a negative effect on economic growth in Kenya. The problem that prompted this study was the realization that previous studies were based on cross country research and as such do not factor in the country specific effects of the components to economic growth. This study therefore looked at Kenya as a specific country and tried to incorporate both private capital inflows and philanthropy and other official flows. The main objective of the study was to examine the effects of external financial inflows on economic growth in Kenya. The specific objectives were; establish the effect of Foreign Direct Investment inflows on economic Growth of Kenya; analyze the effect of Government borrowing from multilaterals on economic growth of Kenya; determine the effect of Foreign Aid inflows on economic growth of Kenya and determine the effect of migrant remittances on economic growth of Kenya. To achieve the objectives an ARDL model was used, preliminary unit root test, co-integration tests. The study sampled a period of 54 years starting from year 1963 to year 2017. Secondary data for analysis was collected from Central Bank of Kenya; Kenya National Bureau of statistics and the World Bank. The findings of this study were expected to form a basis for policy formulation for both policy makers and stakeholders in relation to FDI, Foreign remittances, foreign aid and government borrowing from multilaterals with a view of improving the economic growth to double digits and ultimate realization of vision 2030. The study found that FDI, MR, FA, GB explained significant proportion (89.32%) of the variation in GDP. Further, an increase in the FDI increases the GDP same to MR. Increase in FA decreases the GDP similar to GB. The study concluded that the country should make use of non-tax instruments such as specification on local content of inputs to enhance its benefits from FDI. Second, remittances could cause negative effects by recipient households spending more on luxury goods and leaving little for unproductive savings and investment. In addition, foreign aid can be enhanced positively to affect economic growth through various components such as loans, multilateral and bilateral aid flows, grants and technical cooperation. Further, high levels of debt depress economic growth as external debt slows growth after reaching a threshold level. It is recommended that technology transfer to firms need to be taken into consideration by the government to ensure that there are spillovers to the domestic firms and therefore GDP of the country can be increased in the process. There is also need for human capital accumulation which can reduce or mitigate poverty by increasing income and living standards. In addition, the foreign aids can be more efficiently used to improve their effect on GDP. Finally, the study therefore recommends that more investment by the government is needed to reduce external borrowing.

Keywords: Economic growth, Foreign direct investment, Foreign aid, Remittances. ARDL

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ACRONYMNS AND ABBREVIATIONS

ADB	African Development Bank
AIC	Akaike Information Criteria
ARDL	Autoregressive Distributed Lag model
BOP	Balance of Payments
BSIC	Bayesian Schwarz Information Criteria
CBK	Central Bank of Kenya
ECM	Error Correlation Model
EPZ	Export Processing Zone
ERSWEC	Economic Recovery Strategy for Wealth and Employment Creation
FA	Foreign Aid
FDI	Foreign Direct Investment
GB	Government Borrowing from Multilaterals
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
HIPC	Highly Indebted Poor Countries
HQIC	Hannan Quin Information Criteria
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IMF	International Monetary Fund
KNBS	Kenya National Bureau of Statistics
LDCs	Least Developed Countries
MNCs	Multinational Corporations

MNEs	Multinational Enterprises
MR	Migrant Remittances
OLI	Ownership, Location and Internalization paradigm
PLS	Panel Least Square Estimation Method
SAPs	Structural Adjustment Programmes
SSA	Sub-Saharan Africa
UNCTAD	United Nations Centre for Trade and Development
USSD	United States Dollar
VAR	Vector Auto regression Framework
VECM	Vector Error Correlation Model
VIF	Variable Information Factor
WB	World Bank

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

For many years, the greatest challenge of countries the world over has been on how they can spur economic growth to ensure their overall economic development. This is not only true for developing economies but also for developed economies. As a result, most countries have often opted for external financial inflows as a means to achieving economic growth and development. According to Rey (2015), external financial inflows describe the movement of financial resources into a country mainly but not limited to investment, trade or business production.

Griffiths (2013) classified external financial inflows to include, foreign direct investments (FDI), portfolio equity, remittances, private sector borrowing, philanthropy, grants and external government borrowing. The current study focuses on FDI, migrant remittances, foreign aid, and external government borrowing, as they currently comprise the major sources of foreign capital inflows into the country (Muinga, 2014). If well tapped, external financial inflows can indeed accelerate economic growth without increasing the level of public debt, thus spurring the overall economic development of a country (Muinga, 2014).

Foreign Direct Investment (FDI) is considered as a cross-border investment in terms of net inflows, leading to the acquisition of a lasting interest rate of 10% or more of voting rights in a company operating in an economy other than the investors (World Bank, 2013). This is mainly applicable to multilateral investors with ideas, technology and management skills that can be employed successfully in other countries based on tariff barrier and transport costs differences (Sharmiladevi, 2015). Carcovic and Levine (2002) analyzed FDI and

economic growth acceleration. Balasubramanyam, Salisu and Sapsford. (1996) on his part analyzed the role that FDI plays in the growth process of developing countries that were characterized by different trade policy regimes. They concluded that the beneficial effect of FDI, in terms of enhanced economic growth, is stronger in those countries that pursue all outwardly oriented trade policy than it is in those adopting an inwardly oriented policy.

Foreign aid (FA) consists of funds that are sourced from bilateral and multilateral donors either as grants or loans, which are concessional in nature and are given with the aim of promoting economic development and social welfare of the recipient countries (IMF, 2005). Ekanayake and Chatra (2010) analyzed the effect of foreign aid on economic growth of developing countries using Panel Least Square (PLS) estimation method and found that foreign aid had a mixed effect on economic growth based on time, region and the levels of income.

Migrant remittances (MR) encompass private monetary transfers that are made by foreign migrants to their country of origin and investments made therein (Christensen, Doucouliagos & Paldam 2007). Fayissa and Nsiah (2010), researched on the impact of remittances on economic growth and development in Africa using the Generalized Method-of-Moments (GMM) estimator by Allerano and Bond (1991). From their findings, they established that remittances had a positive effect on economic growth in Africa.

Government borrowing (GB) from multilateral sources e.g. the International Monetary Fund (IMF), International Bank for Reconstruction and Development (IBRD) and the Word Bank, involves borrowing that is meant to bridge the gap between investments and savings in order to finance government operations. According to Were (2001), Kenya's

external debt is mainly official, of which a bigger proportion is from multilateral sources. External debt accumulation has been rising over the years with debt burden indicators increasing steadily in the early 1990s. Like most low-income SSA countries, a greater proportion of Kenya's external debt consists of official debts. A decomposition of official debt shows that in 1970s, official debt was mainly from bilateral sources. From early 1980s onwards, however, multilateral debt constitutes a major proportion of total debt stock. The share of multilateral debt increased moderately in 1980s mainly as a result of large disbursements of adjustment lending from the World Bank (O'Brien & Ryan 1999). Since the early 1990s, the proportion of concessional debt has been rising. The proportion of concessional debt rose from 20% in 1979 to 34% in 1989 and to 63% in 1999, respectively. This has given Kenya the advantage of contracting loans on soft terms (Were, 2001).

In retrospect, Carkovic and Levine (2005) opines that the overreliance of developing countries on external financial inflows stems from the existence of a deficiency in capital, skilled labour, modern technology and low savings capacity. This has been so with the understanding that external inflows will augment their savings, foreign exchange and government revenue and stimulate the growth of the economy in line with the Harrod-Domar model. Developed independently by Harrod (1939) and Domar (1946), this classical Keynesian model of economic growth is used to explain an economy's growth rate in terms of the level of saving and productivity of capital. It suggests that there is no natural reason for an economy to have balanced growth.

Based on the Harrod-Domar model, Kenya has continued to shape her economic policies and development strategies to attract external financial inflows using a myriad of

incentives for foreign investors in the form of stamp duty exemptions, tax holidays and VAT exemptions for companies under the Export Processing Zone (EPZ), (*Export Processing Zones Act, Cap 517 of 1990*).

1.1.1 An outlook of external financial inflows in Kenya

1.1.1.1 Foreign Direct Investment (FDI)

Since 1963 all through the 1970s, Kenya was the most favored destination of FDI in Eastern Africa by investors as it was perceived as the gateway into the region (Abala, 2014). FDI Inflows from 1970 to 2005 have generally been oscillating with some increase in 2006, to a maximum in early 2007 then followed by a sharp drop in the same year as shown by figure 1.1 here below.

FDI increased from US$14 Million in 1970 to US$84 Million in 1979.The early 1980s saw FDI decline to as low as US$ 11 Million by 1984, before rising to US$ 64 Million in 1989. In the 1990s, FDI declined to US$2 Million in 1992 but increased to US$ 146 Million in 1993. FDI rose from US$ 5 Million in 2001 to US$ 729 Million in 2007 (Muinga, 2014). This represents an increase of 144.8% within a period of six years.

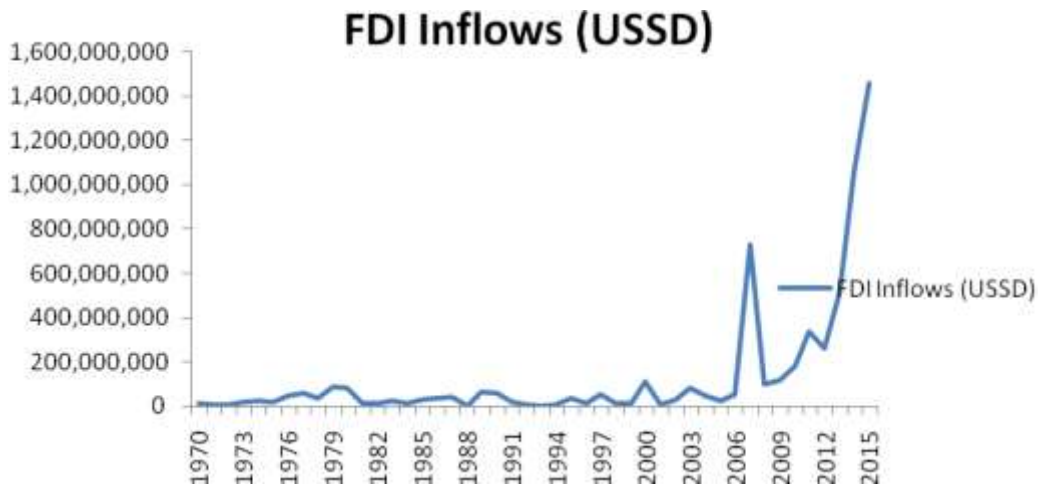

Figure 1.1: Net FDI inflows to Kenya (1970 – 2015)
Source: *http://unctadstat:unctad.org*

In the mid-90s, fluctuations in FDI were attributed to the suspension of any form of financial development assistance and aid to the Kenyan government by both the Bretton Woods institutions and Bilateral Donors who were in support of political inclusivity and good governance, and later in 1997 aid was suspended due to the strained relationship between Kenya and its development partners. Ngugi and Nyangoro, 2005 attribute the rise in FDI in the year 2000 to investment in the mobile telephone sector and borrowing to finance electricity generation due to the drought a the time. Recent increase in FDI is attributed to the Chinese interest in the country not only in the construction industry but also in the communication and manufacturing sector and the exploration of oil in Turkana and titanium mining in Kwale.

1.1.1.2 Migrant Remittances

Diaspora remittances inflows to Kenya have been on an upward trend since independence, thus emerging to be one of the main sources of foreign exchange and external capital. The Figure here below depicts the historical trend from 1970 to 2010.

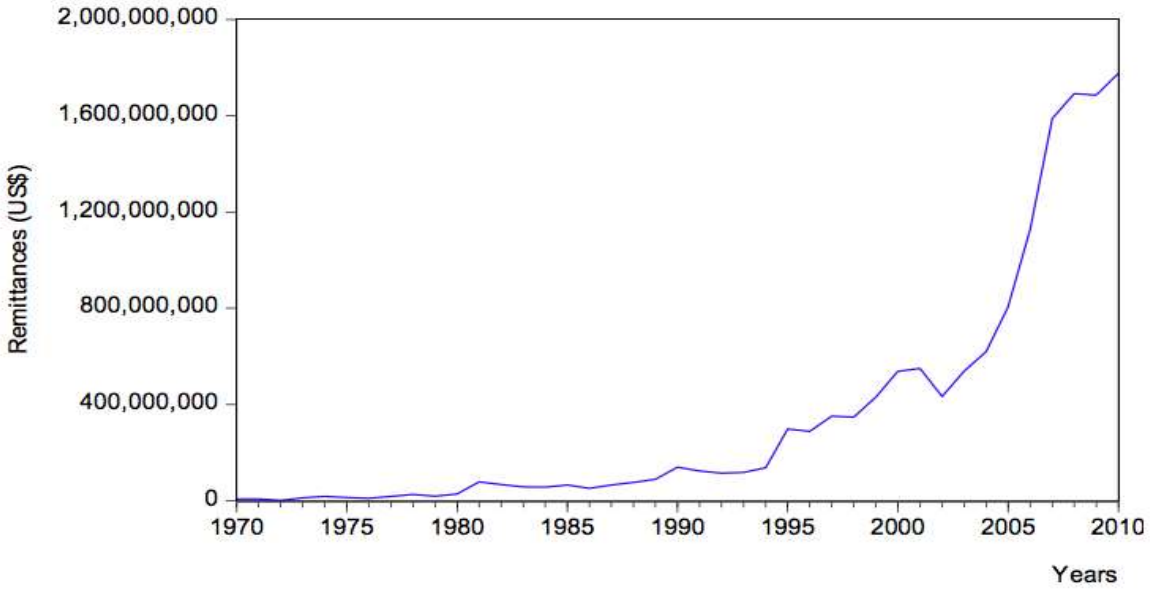

Figure 1.2: Trend of migrant remmitances to Kenya (1970-2010)
Source*: www.centralbank.go.ke/forex/Diaspora-Remit.aspx*

In 1970, remittances were at US$ 7,260,000 and increased to US$89 Million in 1989. By 2009 remittances were at US$609 Million (Omoniyi, & Olawale, 2015). This is despite a drop between 2008 and 2009 that was attributed to the global financial crisis. The increase in remittances is attributed to the increased number of Kenyans working abroad and the constitution that allows for dual citizenship thus offering a reprieve to Kenyans who would wish to invest at home increase their remittances.

1.1.1.3 Foreign aid

Foreign aid to Kenya has been either bilateral assistance in the form of country-to-country, or indirect aid by donors as multilateral assistance, where resources are pooled from various donors. 78% of foreign aid to Kenya emanates from bilateral donors (Mwega, 2004).

Figure 1.3 herebelow provides a summary of the trends in foreign aid inflows for the period between1960 to 2015.

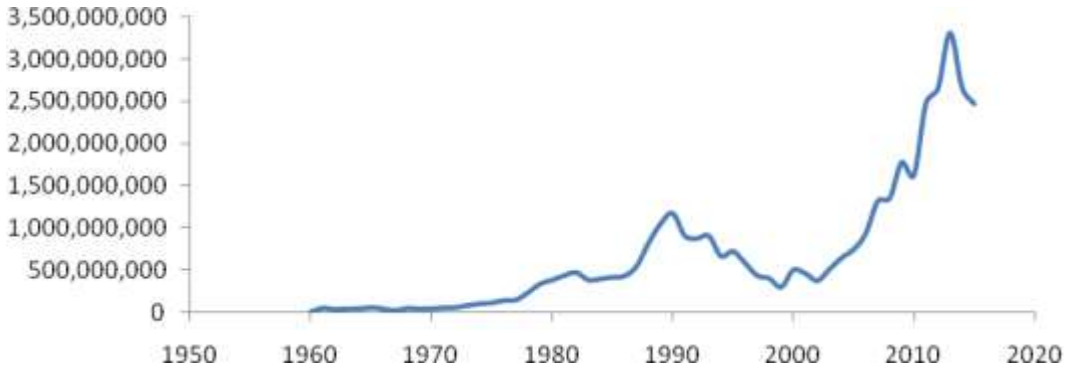

Figure 1.3: Trend of foreign aid to Kenya (1960-2015)
Source: *http://unctadstat:unctad.org*

The period 1980 to 1990 saw an increase in foreign aid as a result of disbursements from the World Bank (WB) under the Structural Adjustment Programs (SAPs), and the need for sustenance of the reforms that were being undertaken. The same was experienced in the period between 2001 and 2011, which was as a result of an increased donor interest in Kenya that had been brought about by regime change.

1.1.1.4 External government borrowing from multilateral sources

Kenya has always relied on external debt for development projects with the aim of improving the existing infrastructure. These funds have been sourced either as foreign financing or loans. Despite the relatively high level of Kenya's external indebtedness, the country has not been included in the list of Highly Indebted Poor Countries (HIPC) debt relief initiative beneficiaries (Were, 2001). Although it is stated that Kenya is expected to reach sustainable levels of debt without special help from the initiative (IMF 2001a), this is unlikely to happen, given the country's current economic situation. While the country is grappling with high poverty levels (with 56% of the population living below the poverty line), economic performance continues to deteriorate. Figure 1.4 here below depicts the trend of external debt over the period between 1970 and 2015.

Figure 1.4: Trend of Kenya's external debt burden (1970-2015)
Source*: World Bank Development indicators*

From 1970, the level of Kenya's external debt has been gradually increasing, with the period from 1973 to 1980 coinciding with the first and second global oil crisis that led to

an increase in oil prices, and an increase in international credit (at lower interest rates). According to Sach and Lorrain (1995), this consequently encouraged most oil importing developing countries to borrow in order to finance oil imports. This was followed by a decline as a result of debt write offs, negative net repayment, and aid embargos. The trend has been on the increase from 1990s.

1.1.2 Economic growth

Kenya's economic growth has been on a gradual upward trend since 1961 as shown in Figure 1.5 herebelow.

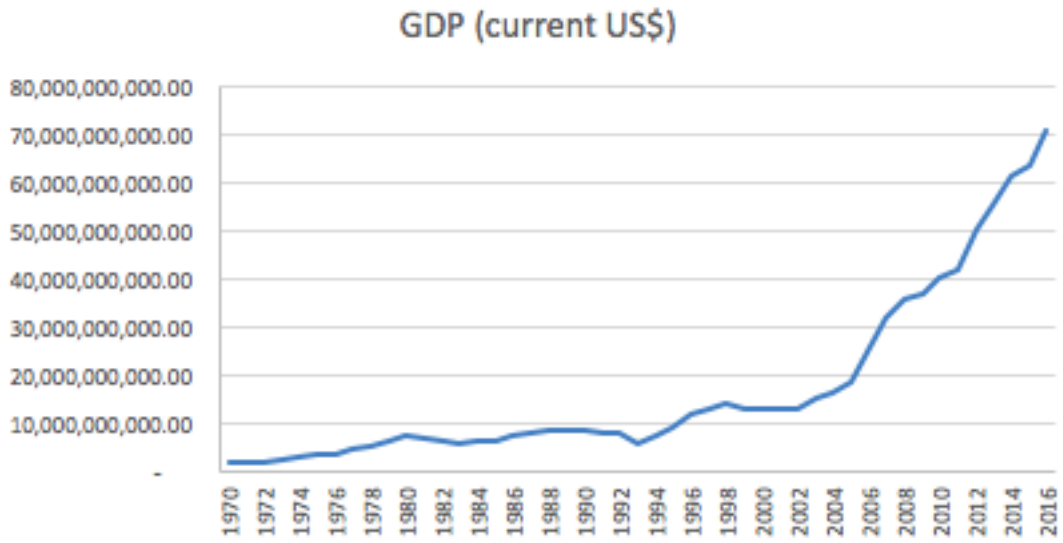

Figure 1.5: Trends of economic growth in Kenya (1970-2016)

Annual GDP growth was high in the first two decades after the country got independence in 1963 due to public investment, encouragement of small-scale holders in agricultural production and incentives for private investment. The period 1994-1996 was characterised by structural reforms that included; liberalisation of commodity prices,interest rates,exchange rates, abolition of exchange controls and import licensing, and

rationalisation of the import tarrif structure. Kenya had also embarked on privatisation and retrenchment of civil servants. All these was done with the help of the International Monetary Fund (IMF) and the World Bank (WB).

Despite the Kenyan government having devceloped the Economic Recovery Strategy for Wealth and Employment Creation (ERSWEC) in 2002, economic performance remained dismal owing to the slow pace of reforms that had been envisaged in the policy document. The agricultural sector being the backborne of the Kenyan economy, only grew by a paltry 0.7% in the period between 2002 and 2010.

1.1.3 Relationship between economic growth and external financial inflows

Figure 1.6 shows the trend of External Financial Inflows and GDP in kenya for the period 1970-2016.

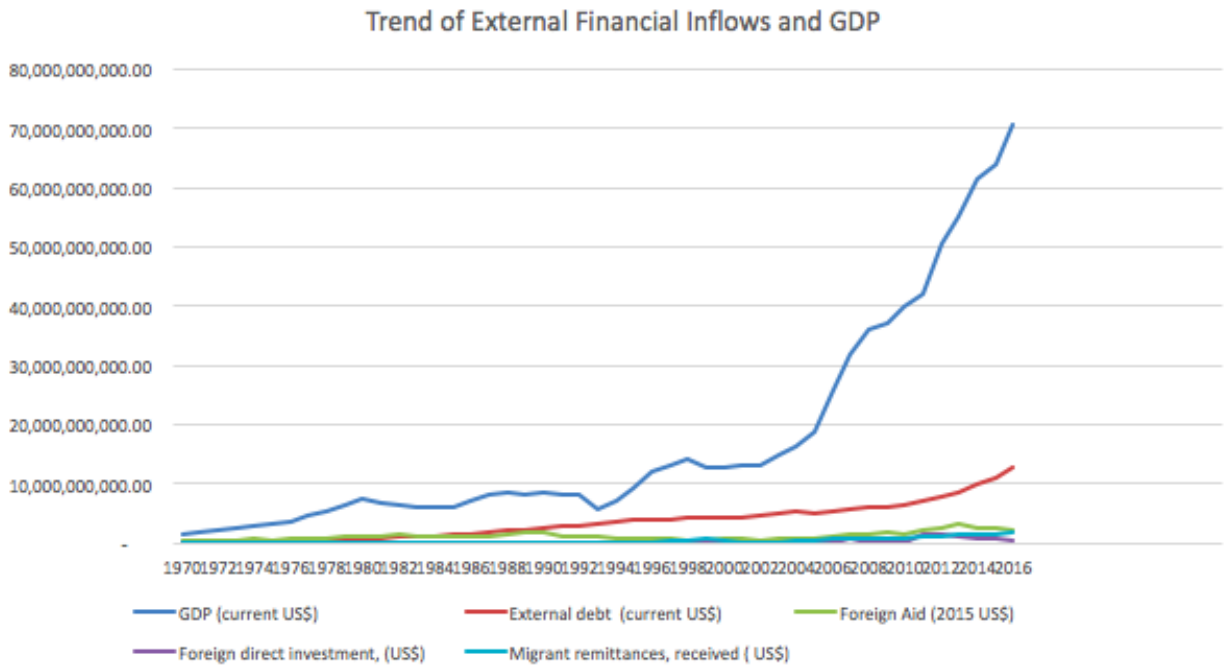

Figure 1.6: Trend of external financial inflows and GDP in Kenya (1970-2016)

Various scholars have looked at this relationship selectively with a component of external financial inflows at a time. Using the ordinary least square method, Mwangi and Mwenda (2015) established that migrant remittances have a positive effect on the economy. Adeniyi, Omisakin and Egwaikhide (2012) found that FDI, FA and migrant remittances all have a positive and significant effect on economic growth.

1.2 Problem Statement

One of the greatest aims of the Kenyan government since independence has been to perpetually spur the levels of economic growth. However, this is driven by a number of factors, amongst them capital. In order to achieve the 10% Gross Domestic Product (GDP) growth rate envisaged in Kenya's *Vision 2030*, there is need to accumulate capital either externally or internally. FDI, migrant remittances, foreign aid and external government borrowing from multilateral sources are all sources of external capital that have the potential to spur the envisaged levels of economic growth.

However, a cross-country review of pertinent literature reveals a capricious climate of thought existing on how each of these external capital inflow sources impacts on economies. For instance, Durham (2003) asserts that private capital inflows adversely affect economic growth, while others, Narender and Dhankar (2016) found only FDI and external commercial borrowing as having a significant role in the reduction of unemployment in India. Fayissa et.al. (2010) and Iqbal (2005) asserted that remittances play a positive and significant role in economic growth, but according Akinlo (2004), it was FDI that had a positive and significant impact on economic growth. Fambon (2013) deduced that FDI had a significant impact on economic growth while foreign aid had a

positive but insignificant impact on economic growth in Cameroon. On the contrary, Nwaogu (2015) found that Foreign aid and FDI had a positive and significant effect on economic growth while remittances had no significant effect on economic growth. Rehman (2016) found the existence of a positive and significant effect in the long term for both FDI and migrant remittances. Subsequently, due to the resultant divergence in study results, it becomes difficult to close in with precision on the impacts of the various sources of external financial inflows on economic growth in a country such as Kenya.

In Kenya, it is indisputable that external financial inflows have been on an upward trend over the past decade, and have grown more than three-fold. On the other hand, the rate of economic growth has also increased over the same period. This scenario therefore presupposes the need to examine whether any correlation exists between the various sources of external financial inflows and economic growth in Kenya.

However, while there are a plethora of studies that analyze the impact of external financial inflows on economic growth, most of these are cross-country (Fayissa & Nsiah, 2010; Gappen et.al. 2009), and not country-specific. The analysis of the effects of external financial inflows on the economic growth of Kenya has also not received the attention it deserves. Further, there are multiple studies that have analyzed the relationship existing between the individual sources of external financial inflows e.g. migrant remittances, and their impact on the Kenyan economy e.g. on inflation (Ocharo, 2014). By concentrating on analyzing single sources of external financial inflows and how they have separately impacted economic growth in Kenya, they get limited in terms of their scope and lack a comprehensive analytical approach.

Hitherto, there has been limited studies that have therefore analyzed a wide range of these external financial inflow sources and how collectively they have impacted on the Kenyan economy. This study sought to fill this research gap by taking a more comprehensive and country-specific approach.

1.3 Objectives of the study

1.3.1 General objective

The overall objective of this study was to determine the effects of external financial inflows on economic growth in Kenya.

1.3.3 Specific objectives

The study addressed the following specific objectives;

1. To establish the effect of Foreign Direct Investment (FDI) inflows on economic growth in Kenya.
2. To determine the effect of migrant remittances on economic growth in Kenya.
3. To analyze the effect of foreign aid inflows on economic growth in Kenya.
4. To evaluate the effect of external government borrowing from multilateral sources on economic growth in Kenya.

1.4 Research questions

The study sought to provide answers to the following research questions;

1. What is the effect of Foreign Direct Investment (FDI) inflows on economic growth in Kenya?
2. What is the effect of migrant remittances on economic growth in Kenya?
3. What is the effect of foreign aid inflows on economic growth in Kenya?

4. What is the effect of external government borrowing from multilateral sources on economic growth in Kenya?

1.5 Limitations of the study

In terms time, this study sought to analyze the effects of a select cluster of sources of external financial inflows on economic growth in Kenya for the period between 1963 and 2017. The study used aggregated data and therefore was delimited in the extent to which the impact had been felt at micro-level.

In terms of content, the study focused on four major sources of external financial inflows in Kenya i.e. Foreign Direct Investment (FDI), migrant remittances (MR), foreign aid (FA) and external government borrowing from multilateral sources. The key limitation foreseen was the availability of comprehensive and detailed data on external financial inflows especially from the national data sources.

1.6 Significance of the study

1.6.1 Policy makers and practitioners

The findings of this study will empower policy makers and practitioners to informatively and objectively examine the impacts of FDI, migrant remittances, foreign aid and external government borrowing from multilateral sources on Kenya's economic growth. The findings of this study will form a basis for economic policy formulation with a view of improving the rate of economic growth to double digits and in ultimately realizing the goals of *Vision 2030*. This way, some of the historical decision lapses that have bogged down the effective implementation of policies that spur economic development can be obviated from.

1.6.2 Researchers and academicians

Other researchers will eventually utilize the findings of this study as part of their secondary data resources while enhancing further research in this and other realms. The results of this study will also act as a template upon which future researchers can base their studies by way of providing a strong and credible reference point.

1.6.3 International Aid Agencies

The findings of this study will form a reference point for international aid agencies on whether their aid leads to expected results. The findings will also provide suggestions for improvement on the use of foreign aid funds, and therefore the agencies can plan on how to distribute their funds effectively.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter explores empirical literature that discusses the impacts of various sources of external capital inflows on the economy, with special focus on FDI, migrant remittances, foreign aid and external government borrowing. To provide the study with a firm theoretical foundation, a sample of relevant economic theories has been analyzed. It also summarizes the literature reviewed and identifies the research gap for the study. The chapter concludes with an illustration of the conceptual framework upon which the study was based, and how it was operationalized.

2.2 Theoretical literature review

Despite the existence of a plethora of theories on this subject, this study was guided by four main theories, owing to their tangential relevance to the study. These are the Eclectic Paradigm theory, the Two-gap model, the MacDougall-Kemp Hypothesis and the internationalization theory. These are discussed here below.

2.2.1 The Eclectic Paradigm Theory

The eclectic paradigm theory of Dunning (1988) provides a framework of three sets of advantages to analyze why, and where, Multinational Enterprises (MNEs) would invest abroad. This is the famous Ownership, Location and Internalization (OLI) paradigm (or eclectic paradigm). In this context, investment could be; natural (resource) seeking, market seeking, efficiency seeking or strategic asset seeking. Dunning is conscious that configuration of the OLI advantages varies from one country to the other and from one

activity to the other. Foreign investment will be greater where the configuration is more pronounced (Rey, 2015).

The ownership advantages (O) refer to firm-specific features sometimes called competitive or monopolistic advantages which must be sufficient to compensate for the costs of setting up and operating a foreign value-adding operation, in addition to those faced by indigenous producers. Such features include things like brand, patents, market access, research and development, trademarks and superior technology. These may be deficient in the host country. When foreign firms use such features in exploiting host country opportunities, they employ adverse selection in an imperfect market situation in fostering their activities. Consequently, due to information asymmetry and limitation of the features possessed by host country firms, competition with MNCs is difficult. The ownership specific advantages, being superior, to home country firms, may make foreign investors to crowd out domestic investments (Miberg, 1996).

The locational advantage (L) strand is concerned with the "where" of production. These include host country-specific characteristics that can influence MNCs to locate an economic activity in that country. They include economic factors such competitive transportation and communications costs, investment incentives, availability of comparatively cheap factors of production, policy issues such tariff barriers, tax regimes, access to local and foreign markets, among other factors (Buckley & Casson, 1998).

The third factor is the internalization advantage (I) which explains 'why' a MNE would want to exploit its assets abroad by opening or acquiring a subsidiary versus simply selling or licensing the rights to exploit those assets to a foreign firm. Yarbrough and Yarbrough

(2002) report that though this theory has been criticized for only listing the conditions necessary for FDI without explaining its phenomenon, it has widely contributed to international production theory.

2.2.2 Two-gap growth model

The origin of the two-gap model was associated with McKinnon (1964) and Chenery & Strout (1966). Although no longer popular in academic literature (indeed, Easterly (1999) calls it a 'dead model'), it is still widely used by policy-makers.

The major assumption of this model is that most developing countries either face a shortage of domestic savings to augment for investment opportunities i.e. the savings gap, and foreign exchange constraints to finance the needed capital and intermediate goods i.e. the foreign exchange gap. This happens when external finance, either grants or loans, supplement domestic resources. In this study, FDI, migrant remittances, foreign aid and external government borrowing, unlike domestic savings, can fill the foreign exchange gap.

Several criticisms have been leveled against the dual-gap model. Firstly, is the link between investment and growth, specifically its assumption of a constant capital-output ratio. However, more recent growth models have put the role of physical capital investment as modest, and have given more emphasis on the role of education, research and development as determinants of growth. Secondly, the model has been criticized on its assumption regarding the relationship between foreign aid and investment. From the point of view of private and public agents in the recipient country, an inflow of aid constitutes additional income. The share to be saved depends on how transitory the additional income

is. According to Harms and Lutz (2004), the longer the aid inflow is expected to last, the more of it will be allocated to current consumption.

Thirdly, it is possible that the government can alter its general expenditure pattern as a result of the aid inflow. Thus, the fungibility of aid makes it unlikely that all aid resources are devoted to investment. In addition, resources may get wasted directly by corrupt government officials and indirectly via rent- seeking activities (Kanbur, 2000).

Bacha (1990) and Taylor (1990) identified a third gap i.e. the fiscal gap. The gap arose due to the lack of capacity by governments of developing countries to raise the revenue necessary for the desired level of investment. In this respect, they argued that foreign aid flows to governments could potentially relax the fiscal gap conditional to it being used for investment purposes. A study by Njeru (2003) sought to examine the impact of foreign aid on public expenditure in Kenya. This could be seen as a way of examining the validity of the fiscal gap in Kenya and the role of foreign aid in filling the fiscal deficit.

2.2.3 MacDougall-Kemp Hypothesis

This theory was developed by MacDougall (1958) and Kemp (1964). According this hypothesis it assumes, a two-country model i.e. one being the investing country and the other being the host country, and the price of capital being equal to its marginal productivity, capital moves freely from a capital abundant country to a capital scarce country. This way the marginal productivity of capital tends to equalize between the two countries. This leads to an improvement in efficiency in the use of resources that leads ultimately to an increase in welfare. Despite the fact that the output in the investing country decreases in the wake of foreign investment outflow, national income does not fall in so far

as the country receives returns on capital invested abroad, which is equivalent to marginal productivity of capital times the amount of foreign investment (Kemp,1964).

So long as the income from foreign investment is greater than the loss of output, the investing country continues to invest abroad because it enjoys greater national income than prior to foreign investment. The host country too witnesses increase in national income as a sequel to greater magnitude of investment, which is not possible in the absence of foreign investment inflow (MacDougall, 1958 & Kemp, 1964).

2.2.4 Internationalization Theory

This theory was developed by Fina and Rugman (1996). Internalization theory focuses on imperfections in intermediate product markets. In effect, they internalize the market in knowledge within the firm. The theory claims the internalization leads to larger, more multinational enterprises, because knowledge is a public good. Development of a new technology is concentrated within the firm and the knowledge then transferred to other facilities (Oviatt & McDougall, 1997).

Theories explaining the process of firm internationalization are dynamic and serve as important complements to the static equilibrium-based theories that explain why multinational firms exist (Niosi & Tschang, 2009). Internalization occurs only when firms perceive the benefits to exceed the costs. When internalization leads to foreign investment, the firm may incur political and commercial risks due to unfamiliarity with the foreign environment. These are known as costs of doing business abroad arising from the liability of foreignness (Fina & Rugman, 1996). When such costs are high a firm may license or outsource production to an independent firm; or it may produce at home and export to the

country instead. Firms without special knowledge may become multinational to internalize supplies of components or raw materials in order to guarantee quality or continuity of supply, or for tax advantages from transfer pricing.

Most applications of the theory focus on knowledge flow (Niosi & Tschang, 2009). Proprietary knowledge is easier to appropriate when intellectual property rights such as patents and trademarks are weak. Even with strong protections firms protect their knowledge through secrecy. Instead of licensing their knowledge to independent local producers, firms exploit it themselves in their own production facilities. In effect, they internalize the market in knowledge within the firm. The theory claims the internalization leads to larger, more multinational enterprises, because knowledge is a public good. Development of a new technology is concentrated within the firm and the knowledge then transferred to other facilities.

2.3 Empirical literature review

To overcome the high poverty levels and improve the standard of living in developing countries there is need for a substantial inflow of external resources in order to fill the savings and foreign exchange gaps. This will increase the rate of capital accumulation and growth. In the following sub-sections, therefore the study proceeds to analyze four key sources of external financial inflows. Multiple case studies drawn from cross-country experiences have been analyzed to lend credence to the subject of the study.

2.3.1 Foreign Direct Investment (FDI) and Economic growth.

Empirical evidence on the relationship that subsists between FDI and economic growth is ambiguous, although in theory FDI is believed to have several positive effects on the

economy of the host country (such as productivity gains, technology transfers, the introduction of new processes, managerial skills and know-how, employee training) and in general it is a significant factor in modernizing the host country's economy and promoting its growth. Especially for the developing countries, the global changes that took place in the 1990's, led them to look favorably at the various FDI's because it was believed that they can contribute to the economic development of the host country.

Phillips and Lothgren (2000) used secondary data adopting linear regressions and reported that a 1% increase in FDI/GDP leads to a 0.8% increase in future domestic investment in Africa compared to 1.17% in Latin America. Many exporting firms are found to locate foreign partners and either form joint ventures with them or hire them as agents for specific technology and/or marketing tasks.

De Mello (1997) surveyed the developments in the literature on the impact of FDI on growth in developing countries. He used linear relationships and adopted secondary data which asserted that FDI is thought of as a composite bundle of capital stocks, know-how, and technology, and that its impact on growth is manifold and vary a great deal between technologically advanced and developing countries. He concluded that the ultimate impact of FDI on growth in recipient economy depends on the scope of efficiency spillovers to domestic firms.

In Nigeria, significant scholarly effort has gone into the study of the role of FDI in the Nigerian economy. Such studies include Akinlo (2004) who posited that FDI has both benefits and repercussions in the context of Nigeria's economic growth and development. He said while FDI could engineer or accelerate GDP growth via the infusion of new

techniques and managerial efficiency, he also warned that it could also worsen the balance of payments (BOP) position.

Caves (1996) observed that the rationale for increased efforts to attract more FDI stems from the belief that FDI has several positive effects. Among these are productivity gains, technology transfers, the introduction of new processes, managerial skills and know-how in the domestic market, employee training, international production networks, and access to markets. The study further perceived FDI as an important vehicle for the transfer of technology, contributing to growth in larger measure than domestic investment.

Findlay (1978) used time series data and postulated that FDI increases the rate of technical progress in the host country through a "contagion" effect from the more advanced technology, management practices, etc., used by foreign firms. On the basis of these assertions, governments have often provided special incentives to foreign firms to set up companies in their countries.

Carkovic and Levine (2005) studied foreign direct investment and economic growth using panel data and noted that the economic rationale for offering special incentives to attract FDI frequently derives from the belief that foreign investment produces externalities in the form of technology transfers and spillovers.

In summary, there is evidence from a few studies addressing the link between FDI and technology transfer in Africa. Wangwe (1995) covering firms in six African countries: Zimbabwe, Tanzania, Nigeria, Kenya, Ivory Coast, and Mauritius; Biggs and Srivastava (1996) covering Ghana, Zimbabwe, and Kenya; Phillips and Lothgren (2000) on Mauritius,

Uganda and Kenya suggests that there may be limited technology transfer and spillovers to the domestic firms.

2.3.2 Migrant remittances and Economic Growth

There has been a growing interest in Diaspora remittances by the Kenyan government as evidenced in its long-term development plan, Kenya's *Vision 2030*. This warrants an investigation into the effect of remittances on the economic growth of Kenya. Migrant remittances are not only a source of foreign exchange but also have become the second largest source of external finance for developing countries after foreign direct investment (FDI) (World Bank, 1998).

According to Mim and Ali (2012) the effect of remittances on the economic growth of a country can be looked at in three ways: first, they can be spent like any other income and therefore their contribution to economic growth can be seen as the contribution by any source of income. Second, remittances can cause negative effects by recipient households spending more on luxury goods and leaving little for unproductive savings and investment like housing, land and jewelry.

Ang (2007) investigated whether remittances have spurred growth in Philippines. The study used data for the period 1988-2004 and with OLS estimation found that remittances have a positive effect on economic growth. The positive effect was attributed to low spending and more investments in the country.

Gappen et.al. (2009) investigated the relationship between remittances and economic growth for a sample of 84 recipient countries for the period 1970-2004. The study carried

out a panel growth estimation regression for the full sample and for emerging economies. This study found that remittances have no impact on economic growth.

In their work, Sidique et.al. (2010) investigated the relationship between remittances and economic growth for Bangladesh, India and Sri Lanka, for the period 1975-2006. The authors employed a Granger Causality test under the Vector Auto Regression (VAR) framework. They found that there was no causal relationship between economic growth and remittances in India, that there was a two-way relationship between remittances and economic growth in Sri Lanka, and that remittances did not lead to economic growth in Bangladesh.

Fayissa and Nsiah (2010) in their investigation of the aggregate impact of remittances on economic growth of 18 Latin American countries within the neoclassical growth framework using the panel data for the period 1980-2005, found that remittances have a positive and statistically significant effect on the growth of Latin American countries. A 10 percent increase in remittances of a typical Latin America economy resulted in about 0.15 percent increase in the average per capita income.

Mim and Ali (2012) investigated the growth effects of remittances and the channels through which they may affect economic growth in MENA countries of Algeria, Egypt, Djibouti, Iran, Jordan, West Bank and Gaza, and Yemen. They used panel data for the period 1980-2009. Using the System Generalized Method of Moments, they found that remittances had a positive and statistically significant coefficient, leading to the conclusion that remittances positively and significantly affect economic growth in MENA countries.

A study on the impact of remittances on economic growth in Sub- Saharan Africa countries by Ikechi and Anayochukwu (2013) targeted three countries of Nigeria, Ghana and South Africa. The study used time-series data for the period 1980-2010 to determine the effect of remittances on economic growth. They also conducted a Granger Causality test to determine the direction of causality between the two variables. The study found that workers' remittances had impacted positively on the economic growth of the three countries, with the greatest impact felt in South Africa followed by Ghana and then Nigeria. Remittances were found to granger cause economic growth in South Africa and Ghana, whereas economic growth was found to granger cause remittances in Nigeria.

In summary, remittances have been found to enhance growth through human capital accumulation and can mitigate poverty by increasing the recipient family's income and living standards (Gupta, Pattillo and Wagh. 2009; Mim & Ali, 2012). It is argued that remittances are not only relatively stable than other financial flows but also tend to increase during periods of economic depression and natural disasters. Remittances have also been found not have the effect of eroding the country's export competitiveness unlike aid flows (Yang, 2006). Remittances can be used to support the capital account of the balance of payments (BOP), domestic investment, increase the flow of finances during the period of natural disasters at the national level; smooth consumption at the household level; finance development projects and enhance the capacity to import.

2.3.3 Foreign aid inflows and Economic Growth.

The origins of foreign aid can be traced back to the Marshall Plan that was developed by America following the end of the Second World War in 1945. The intention of the USA

funded Marshall Plan was to bring development to Europe following the effects of the World War. Hitherto, foreign aid forms one of the largest components of foreign capital flows to low-income countries (Radelet, 2006). The question as to how foreign aid affects the economic growth of developing countries has drawn the attention of many scholars over time. The results of their studies have also been varied.

Chenery and Bruno (1962), Chenery and Strout (1966), Mosley (1980) and Karras (2006) studied foreign aid inflows and found that foreign aid positively affects economic growth. The studies used Autoregressive Distributed Lag (ARDL) model and various components of foreign aid including loans, grants, technical cooperation, multilateral and bilateral aid flows to estimate a disaggregated short-run and long-run relationship between foreign aid and economic growth. They found that total aid flows and its various forms had positive and significant impacts on economic growth.

Singh (1985), Snyder (1993), Burnside and Dollar (1997), Bearce and Tirone (2008); and Salisu and Ogwumike (2010) have all found out that foreign aid leads to growth, but only under certain conditions. Specifically, Singh (1985) found out that foreign aid had a strong positive impact on economic growth in less developed countries (LDCs) for both periods 1960-1970 and 1970-1980, when state intervention was not considered. When the state intervention variable was included in the regression, the effect of foreign aid got statistically weak over time. Snyder (1993) argued that when country size was not included, the effects of aid on economic growth were small and insignificant, but when country size was considered, the coefficient of aid became positive and significant.

Burnside and Dollar (1997) emphasized that good-policy environment was essential for this positive relationship to occur.

Bearce and Tirone (2008) explored the relationship between economic growth and foreign aid conditioned on the level of democracy in the potential recipient country. They further found that the effect of aid on GDP depended on a trade-off that is country-specific: aid had a direct positive effect through financing investment but could have an indirect negative effect on aggregate productivity.

Papanek (1972), Newlyn (1973) and Knack (2000) all used time series data and found a negative relationship between foreign aid and growth. Specifically, the studies observed that high levels of aid had the potential to erode institutional quality, increase rent-seeking and corruption, thus negatively affecting growth.

Easterly, Levine and Roodman (2003) re-examined works by Burnside and Dollar (1997) using a larger sample size and found that the results were not as robust as before. Some of the explanation for the negative relationship was that foreign aid is fungible.

Pedersen (1996) noted the inconclusiveness of the impact of foreign aid on economic growth. It was further found that foreign aid had a mixed impact on economic growth of developing countries. Notably, the study assumed that foreign aid flows are predictable and therefore the recipient countries can effectively and timely reflect them in their development planning process. It is also based on the premise that aid commitments and disbursements are the same.

2.3.4 External government borrowing from multilaterals

There has been a growing concern in Kenya in regard to the increase in government debt in recent times. Were (2011) found out that foreign debt increase has risen over the years and debt load index was on the rise. She said that Kenya's foreign debt was principally formal with a large portion coming from multilateral sources. Private investment and economic growth impacted negatively on foreign debt. The main sources of external debt financing in Kenya are multilateral creditors. IDA, ADB/ADF and EEC/EIB are the main multilateral creditors. IDA is the single largest source of external resources. In terms of bilateral creditors, the main ones are Japan, France, China and Germany. China is the largest bilateral donor.

The study by Akomolafe et. al. (2015) analyzed the Impact of the Public Debt Burden on Economic Growth in Nigeria and Bangladesh respectively. Their study divided domestic debt and external debt effects to the economy. They applied Johansen co-integration test, Error Correction Model (ECM) and Vector Error Correction Model (VECM) to establish the association between each set of variables. The study revealed that a significant positive relationship exists between total public debt and investment, and between total public debt and Government's reserves. The empirical outcomes of the study also reveal that domestic debt has a negative relationship with domestic investment in both short-run and long-run. On the other hand, a negative relationship of total public debt exists with manufacturing sector and Government subsidy. However, no strong statistical evidence has been found regarding the negative impact of domestic debt and external debt on the GDP growth rate. The study concluded that both domestic debt and external debt crowd-out private

investment in the short run, Governments should strive to reduce their debt profiles by improving their revenue base.

Hansen (2001) analyzed the impacts of foreign aid and external debt on growth and investment using data from 54 countries considered either as Heavily Indebted Poor Countries (HIPC). The empirical results showed that initial stock of external debt had a negative effect on growth. He found a significant negative impact of debt service on growth where 10% increase in the debt service ratio leads to a 1% drop in economic growth. Thus, in this study, he concluded that both foreign aid and debt stock have no impact on investment but debt service has a significant crowding-out effect. This is collaborated by Iyoha (1999) in his study on external debt and economic growth in Sub-Saharan African (SSA) countries.

Muinga (2014) analyzed external debt, public investment and growth in low-income countries. They opined that high levels of debt depress economic growth in low-income countries as external debt slows growth only after reaching a threshold level of about 50% of GDP. They posited that external debt has an indirect effect on growth through its effect on public investment while public debt does not appear to depress public investment. Debt service does with a non-linear relationship with the crowding-out effect intensifying as the ratio of debt service to GDP rises. On average, for every percentage point increase in debt service, public investment reduces by 0.2% of GDP. Thus, a reduction in debt service of about 6% of GDP would raise public investment by between 0.75 to 1%.

2.4 Summary and research gap

The studies reviewed so far have shown a great divergence in terms of their findings, with some showing a negative relationship between the various forms of external financial inflows and their impacts on economic growth, while others found a positive relationship. This shows that studies on the impact of the various forms external financial inflows are still inconclusive, as experiences vary from country to country. In accession, in order to provide a firm theoretical foundation for the study, the impact of external financial inflows on economic growth was also reviewed through the lens of several economic theories. These include the Eclectic paradigm theory, the two- growth model, gap internationalization theory, and the MacDougall-Kemp hypothesis. These were used owing to their tangential relevance to the study.

This review revealed that most studies have been cross-country in nature. The value of cross-country studies is that they allow one to try and identify factors that help to explain cross-country variations in growth performance. However, this has not been without any problems. According to Herzer and Morrissey (2011), the reliance on cross-country panel growth regressions suffers from failure to account for cross-country heterogeneity. The limitation of the cross-country approach is that it is not usually informative for a particular country. Its assumption of parametric invariance across countries renders it difficult to interpret results for a single country and therefore difficult to derive country-specific policy implications (Harrison, 1996; Durlauf, 2002; Hoeffler, 2002). It is in light of this observation that a country-specific study is deemed relevant.

Further, it is observable that many studies focused on analyzing the sources of external

financial inflows separately and their impact on economic growth. But hitherto, there has been no study that specifically addresses several sources in relation to their impact on a specific country's economic growth. In this sense, they lack comprehensiveness and thus become limited in terms of their scope.

This study, therefore, sought to fill the existing research gap by analyzing the impact of four (4) key sources of external financial inflows and their impact on Kenya's economic development. This approach is considered to have a wider scope, is more comprehensive and above all, it is country-specific.

2.5 Conceptual framework

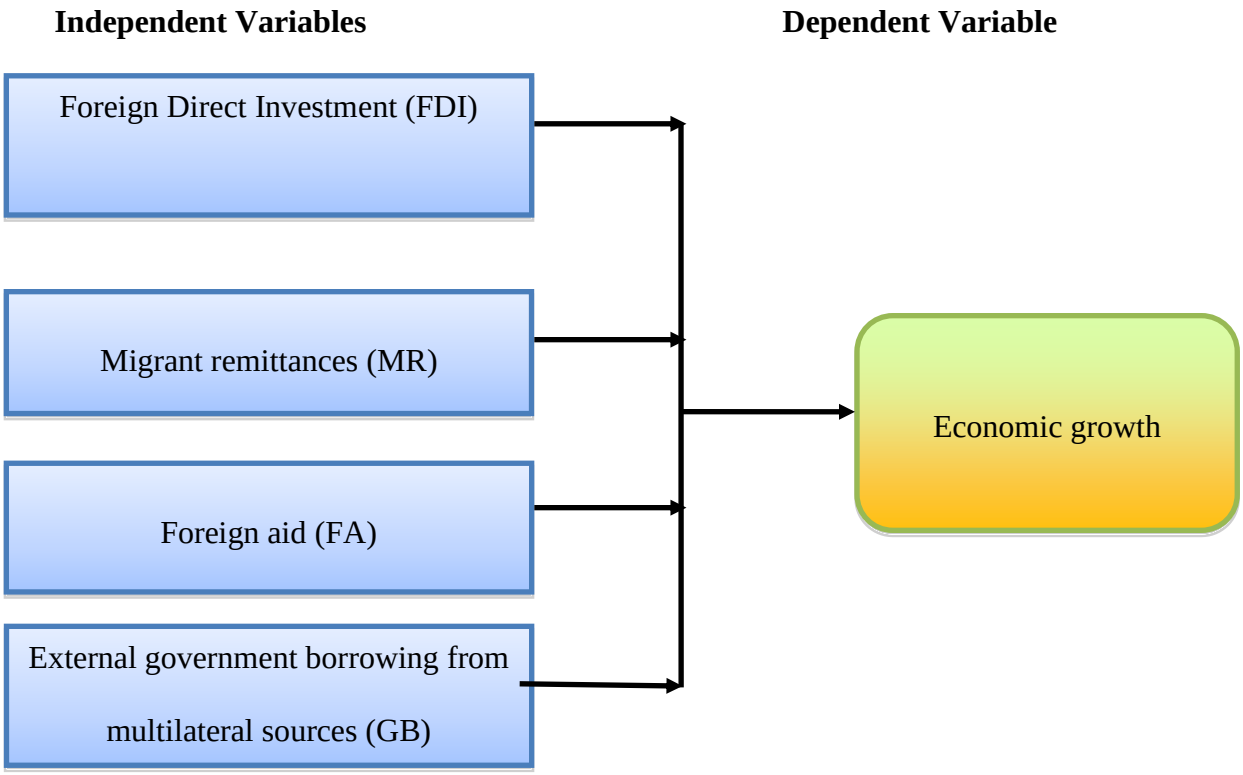

Figure 2.1: Conceptual Framework

2.6 Operational framework

This sub-section provides a summary portrayal of how the entire conceptual framework was operationalized. It clearly describes the independent variables of the study, how they were abbreviated, how they related to the dependent variable and ultimately on how they were measured.

Table 2.1: Operational framework

Variable	Abbreviations	Description	Measure
Foreign Direct Investment	FDI X1	Involves the transfer of not only ownership but for the factors complementary to capital including technology, management as well as organizational skills.	FDI Measured annually as a percentage (%) of GDP
Migrant Remittances	MR X2	Money sent from overseas by Country migrants	MR measured as an annual percentage (%) of GDP
Foreign Aid	FA X3	Inflows from abroad that include grants and overseas development assistance (both bilateral and multilateral aid, ODA)	FA measured annually as a percentage (%) of GDP
Government Borrowing from multilaterals	GB X4	A method of financing government operations where funds are borrowed from multilateral organizations e.g. the World Bank, IMF and IBRD	GB from multilaterals measured annually as a percentage (%) of GDP
Gross Domestic Product	GDP Y	A gross output of all finished goods and services in the entire economy	Measured as GDP % growth rate

Source: Researcher, 2018

2.7 Operationalization of the variables

Gross Domestic Product (GDP) was obtained as the gross output of all finished goods and services in the entire economy. GDP is normally used because it is a good measure of development in an economy. The data was collected from Kenya National Bureau of Statistics (KNBS), statistical quarterly abstracts for the period between 1963 to 2017. It was measured in real terms.

Migrant remittances (MR)**,** consists of personal transfers and compensation of employees from abroad. Personal transfers consist of all current transfers in cash or in kind made or received by resident households to or from non-resident households. Compensation of employees refers to the income of border, seasonal, and other short-term workers who are employed in an economy where they are not resident and of residents employed by non-resident entities. It was measured as a percentage (%) of GDP.

Foreign Direct Investments (FDI) shows the net inflows of foreign investments in the country. If FDI is channeled into productive use it can lead to economic growth. The data was collected from the Kenya National Bureau of Statistics (KNBS) and the World Bank (WB), statistical abstracts for period 1963 to 2017. It was measured as a percentage (%) of GDP, while Foreign aid (FA) refers to Official Development Assistance (ODA), and was measured as a percentage (%) of GDP.

Government borrowing from multilaterals (GB) refers to a method of financing government operations. The government borrows either from the domestic or external

markets in order to bridge the gap between investments and savings. This study specifically focused on government borrowing from multilateral organizations e.g. IMF, World Bank or the IBRD. It was measured as a percentage (%) of GDP.

CHAPTER THREE
METHODOLOGY

3.1 Introduction

This chapter presents the research design, sources of data and data collection methods. It also specifies the econometric model that was used and the empirical tests that were applied to address the research questions of this study.

3.2 Research design

Creswell (2003) defines research design as "….the scheme, outline or plan that is used to generate answers to research problems". This study used descriptive research design to explain the relationship between external financial inflows to economic growth. The study applied the statistical technique of correlation to establish the relationship between the dependent and independent variables.

3.3 Data collection and its sources

The study used secondary data and the period of analysis is 1963-2017. The data is time series data with a yearly frequency. The study obtained data from Kenya National Bureau of Statistics (KNBS), the Central Bank of Kenya (CBK) and the World Bank (WB). These sources of data were selected based on their reliability and validity as the data has been collected, consolidated and published by experienced researchers, coupled with the accessibility and ease of retrieval. See Appendix 1 for data collection worksheet.

3.4 Model specification

This study used the Autoregressive-Distributed Lag (ARDL) model, in the sense that Yt is explained (in part) by lagged values of itself. It also has a "distributed lag" component, in the form of successive lags of the "x" explanatory variable, as shown below.

$$Y_t=\beta_0+ \beta_1 y_{t-1} + \beta_2 X_{1t-1}+ \beta_2 X_{2t-1}+ \beta_3 X_{3t-1}+ \beta_4 X_{4t-1}\ \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

If the variables under testing are persistent i.e. values in the far past are still affecting today's values, then more lags are necessary. In order to determine how many lags to use, the study used Information Criteria.

3.5 Data analysis procedures

The first step was the unit root square test using mainly the Augmented Dicky Fuller test as proposed by Omoniyi and Olawale (2015) who states that while this is not necessary when using ARDL especially order 1(1), it is important to determine the properties of the time series data so as to avoid spurious correlation where the order 1(2) which leads to crushing of the ARDL technique. The study then employed Autoregressive Distributed Lag (ARDL) bounds testing approach method using ADF method.

After the ARDL bounds test approach the model was subjected to diagnostic tests for heteroscedasticity, multicollinearity, serial autocorrelation, normality, omitted variable bias and model stability. Data analysis procedure was done using STATA software.

3.5.1 Preliminary tests

While the model does not need pretesting for stationarity of the variables, it was still necessary to conduct unit root test. This is so because ARDL tests fail with variables

integrated to order two 1(2) thus leading to crushing of the technique. This study used the Philips and Perron Tests (PP) to test for the stationarity of the variables;

Ho: *There is a unit root (data is non-stationary); Reject if test statistics is greater than the critical value.*

3.5.2 Lag length selection

If the variable(s) under testing is persistent i.e. values in the far past are still affecting today's values, then more lags would be necessary. In order to determine how many lags to use, this study used Information Criteria (IC) to determine the optimum lag length which includes the Akaike Information Criteria (AIC), Hannan Quin Information Criteria (HQIC) and Bayesian Schwarz Information Criteria (BSIC). This is chosen as it gives relatively efficient estimates.

3.5.3 Diagnostic tests

3.5.3.1 Serial autocorrelation

The Breusch-Godfrey Langrange Multiplier (BG-LM) test was used to test for serial autocorrelation of the residuals in the regression, the null hypothesis is that there is no serial autocorrelation of any order when $p > 0.05$.

Ho; no serial auto correlation

3.5.3.2 Multicollinearity test

This is the existence of a perfect linear relationship among some or all the independent variables of the regression model. The Variance Inflation Factor (VIF)is used to test for multicollinearity with a VIF < 5 showing that there exists no multicollinearity

3.5.3.3 Heteroscedasticity

This refers to the error variance being non-constant, to test for heteroscedasticity The Bresch-Pagan test is used. If the p value p>0.05 then there is constant variance the null hypothesis is accepted

Ho: *Constant variance*

3.5.3.4 Normality test

To test for normality of the residuals the Shpiro-Wilk test is used. If p> 0.05 then the residuals are normally distributed and therefore accept the null hypothesis

Ho: *Normality of residuals*

3.5.3.5 Omitted Variable Bias test

To test for omitted variables the Ramsey reset test is used, If the p valu p> 0.05 then there are no omitted variables and the null hypothesis is accepted

Ho; *no omitted variables*

3.5.4 Robustness check

The findings of the ARDL bounds test approach are tested for robustness and consistency using the Johansen co-integration test and VECM approach thus the robustness test is used to determine if there exists any consistency in the findings of the ARDL bound test approach and the findings of the Johansen test for co-integration and the VECM approach, by the following steps.

3.5.4.1 Optimal lag length selection using IC

The Information Criteria is used to determine the optimal lag length which includes Akaike Information Criteria (AIC), Bayesian Schwarz Information Criteria (SBIC) and the Hanna Quinn Information Criteria (HQIC) leading to selection of the most efficient and significant lag length.

3.5.4.2 Johansen test for co-integration

Co-integration and long run relationship is determined using the Johansen co-integration test that gives the number of co-integrated equations and their significant lag length

3.5.4.3 Vector Error Correction Model

Once co-integration equations have been determined a VECM is carried out to determine the short run relationship between the variables and the error correlation term after which post estimation tests are carried out.

3.5.4.4 Post estimation tests

3.5.4.4.1 Normality test

The Jaque-bera test, skewness test and kurtosis test is carried out to test for normality of the residuals and if P>0.05 the null hypothesis is accepted

Ho: *normality of residuals*

3.5.4.4.2 Serial correlation test

The Langrange multiplier test is used to test for serial auto correlation. If P>0.05, the null hypothesis of no correlation at lag order is accepted

Ho: *no auto correlation at lag order*

3.5.4.4.3 Impulse response function.

This is the reaction of a variable to shocks in the system. This is determined so as to show the effect of shocks, the significance and up to what period do the shocks last on the variable itself and on other variables.

3.5.4.4.4 Orthogonalized impulse response function

These are displayed in graphs to show the effect of the shocks, significance and up to what period do the shocks last on the variable itself and on other variables.

3.5.4.4.5 Predicted co-integrating equation

The predicted co-integrating equation is displayed in a graph to show the trend of the co-integrating equation. A stable model has the trend of a stationary series.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents the findings from the data analysis. The purpose of this study was to determine the effects of external financial inflows on economic growth in Kenya. The chapter analyzes findings using descriptive statistics, ARDL bounds test approach, diagnostic tests and post estmation tests. The GDP as a measure of economic growth was modelled against several variables namely; FDI, MR, FA and GB.

4.2 Descriptive Statistics

The results in Table 4.1 provide the descriptive statistics of the variables namely; GDP, FDI, MR, FA and GB for the period 1963 to 2017. The data comprises of yearly time series collected from various institutions.

Table 4.1: Descriptive Statistics for Study Variables

Variable	Obs	Mean	Std. dev	Min	Max
GDP	55	0.0495273	0.419329	-.047	0.222
FDI	55	0.0076621	0.006998	0.0000472	0.0345734
MR	55	0.138068	0.107195	0.0028493	0.453516
FA	55	0.1563385	0.1413383	0.0297852	0.6359733
GB	55	0.0731998	0.0593102	0.0056664	0.2273777

The descriptive statistics findings in table 4.1 above show that the average rate of growth of GDP was 0.049 units per annum with a mimnimum of -0.047 and a maximum of 0.22 units. The average FDI flow was 0.00766 units per annum with a minimum of 0.0000472 units and a maximum of 0.03457 units. In addition, the average MR was 0.138068 units

per annum with a minimum of 0.0028493 units and a maximum of 0.453516 units, average annual flow of FA was 0.156 units per annum with a minimum of 0.029 units and a maximum of 0.6359 units. Further, the mean GB was 0.0731998 units per annum with a minimum of 0.0056664 units and a maximum of 0.2273777 units. Since the standard deviation was lower than the mean values, no transformation was required in the study.

Trend analysis was also done which provides graphical representation of the movement and changes of the variables under study over the years 1963 to 2017. The findings obtained indicated that the GDP was less than 1 in 1963 which increased over the years till 1970, when the GDP recorded was the lowest at -0.5. However, GDP was the highest over the 1970's. It was also observed that GDP dropped from the 1980's to 1990's but has since remained between 0 and 1 as shown in Figure 4.1.

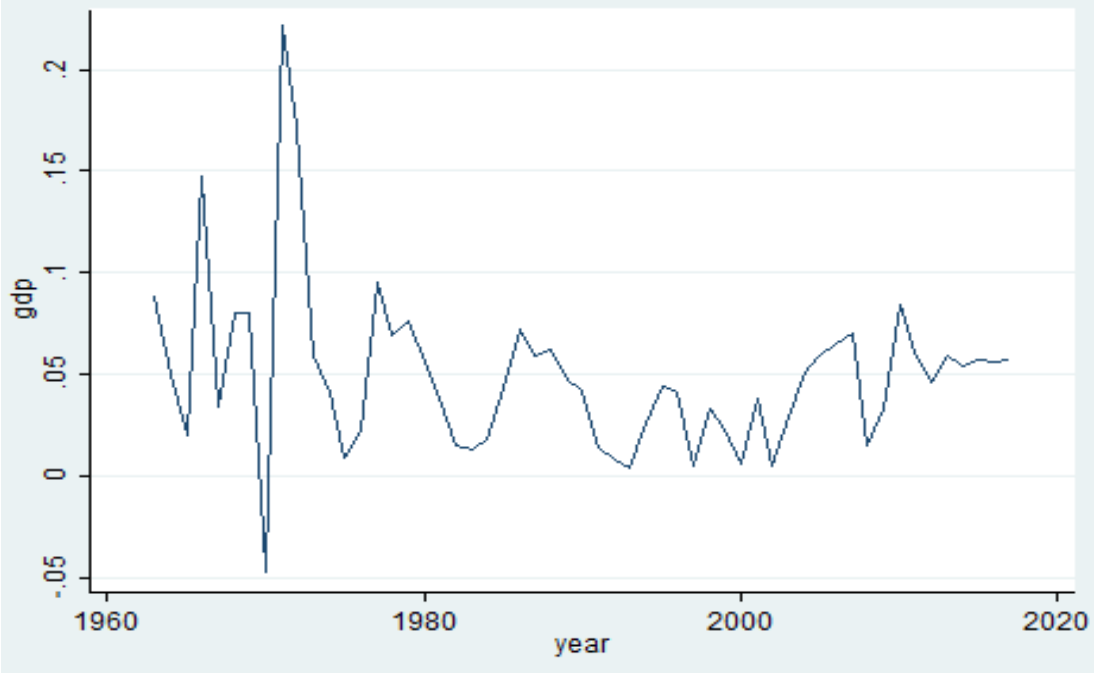

Figure 4.1: Trend Analysis for GDP

The findings on FDI indicate that values were the highest in the 2010's at 0.35 as compared to the 1960's when the values were the lowest. However, FDI was also high in the 1990's and 2000's as shown in Figure 4.2.

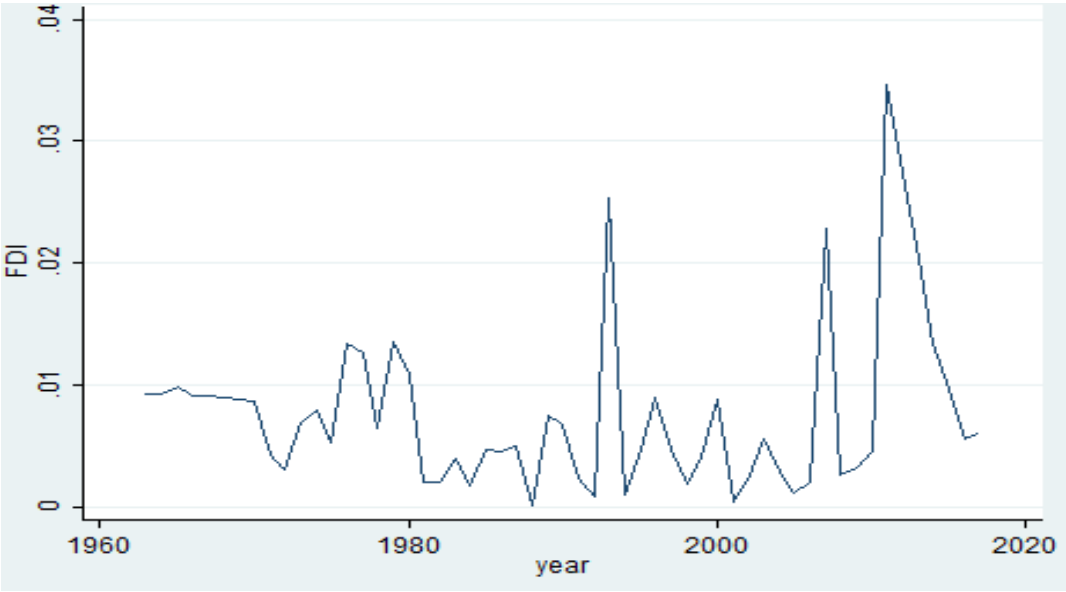

Figure 4.2: Trend Analysis for FDI

The findings on MR indicate that MR was the highest in the 2000 while 1963 had the lowest value of MR. From the trend, it can be inferred that MR has been increasing over the years as shown in Figure 4.3

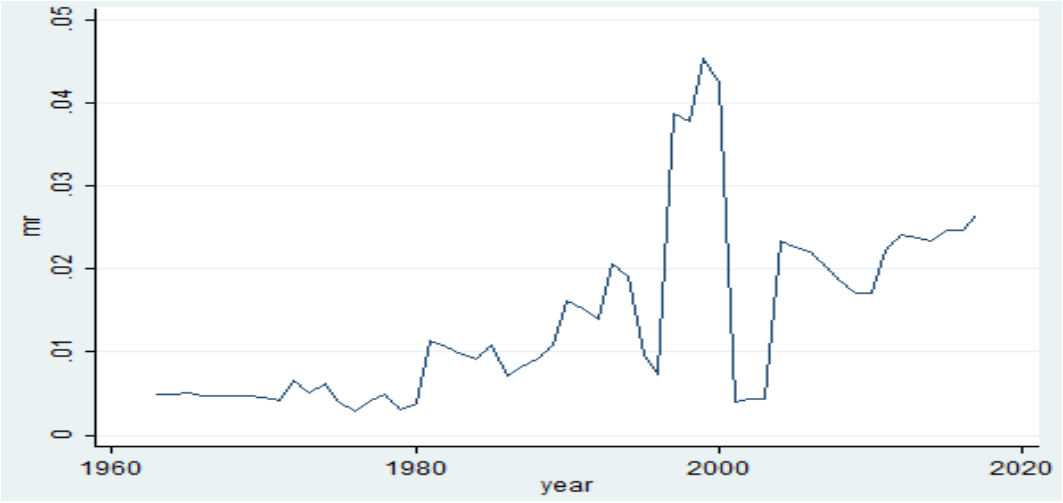

Figure 4.3: Trend Analysis for MR

The findings on FA indicate that FA was the highest in the 1960's at 6 which dropped till the 1990's when it improved to 2 in the 1990's. However, there has been drops throughout the following years till 2017 as shown in Figure 4.4.

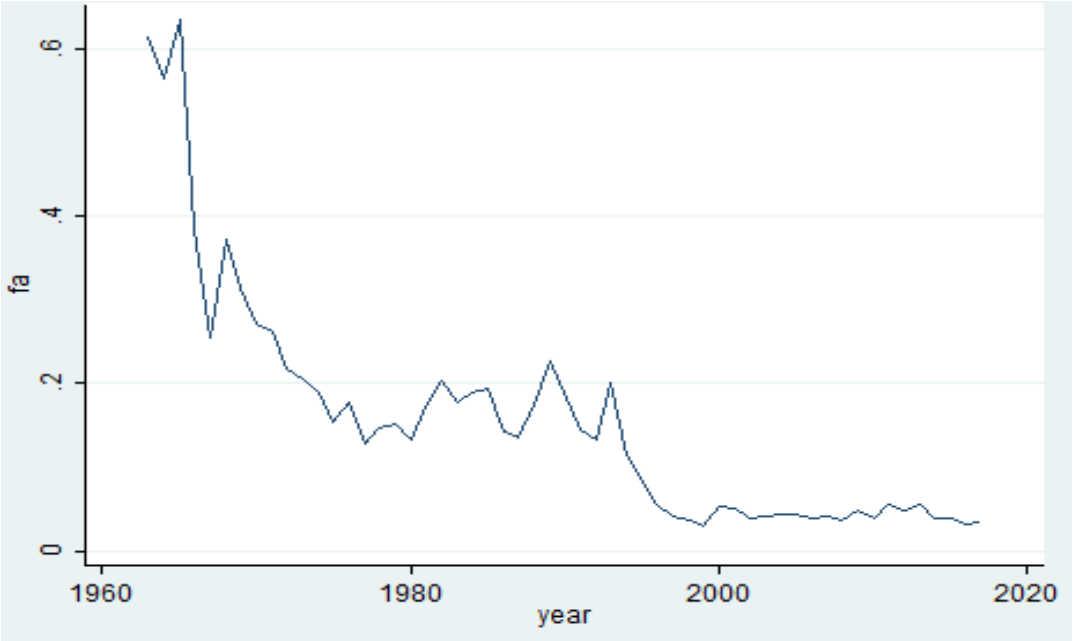

Figure 4.4: Trend Analysis for FA

The findings obtained indicated that the GB was the lowest in 1963 which increased over the years till 2000, when the GB recorded was above 2.0. However, GDP has been decreasing over the years till 2015, where there is a slight increase till 2017 as shown in Figure 4.5.

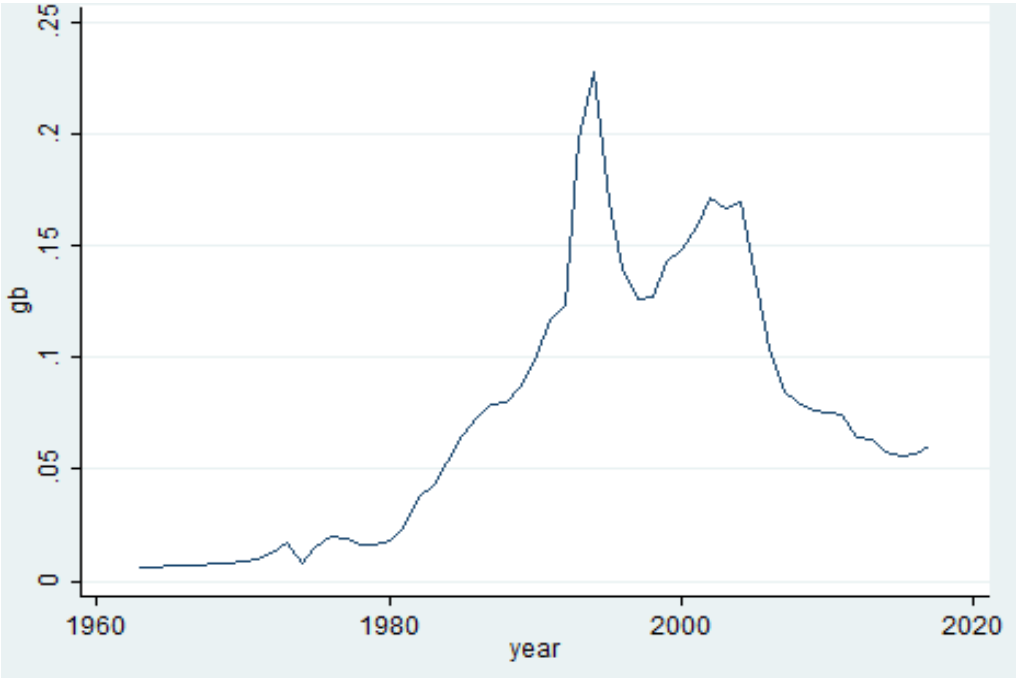

Figure 4.5: Trend Analysis for GB

4.2.1 Correlation Analysis

The study conducted correlation analysis between the dependent variable (GDP) and all the independent variables (FDI, MR, FA and GB). The findings are presented in Table 4.2.

Table 4.2: Correlation Matrix

Variable	GDP	FDI	MR	FA	GB
GDP	1.0000				
FDI	0.0500 (0.7169)	1.0000			
MR	-0.2356 (0.0834)	0.0891 (0.5175)	1.0000		
FA	0.1898 (0.1652)	0.0251 (0.8556)	-0.5305* (0.0000)	1.0000	
GB	-0.3651* (0.0061)	-0.1504 (0.2732)	0.4891* (0.0002)	-0.5531* (0.0000)	1.0000

The correlation matrix findings in Table 4.2 above show that there a positive and insignificant relationship between FDI and GDP. There is also a negative and insignificant relationship between MR and GDP. Further, there is a positive and insignificant relationship between FA and GDP. However, the findings indicate that there is a negative and significant relationship between GB and GDP.

It is important to note there are no two independent variables which are highly correlated which indicate that there is no multicollinearity problem. Since multicollinearity is not a problem in the study, ARDL bounds test approach to determine the short run and long run relationships between the variables was used. The ARDL bounds test approach takes in to consideration a preliminary unit root test, co-integration tests, error correction model and diagnostic tests.

4.3 ARDL Bounds Test Approach

4.3.1 Unit Root Test

Prior to testing for a causal relationship and co-integration between the time series, the first step is to check the stationarity of the variables used in the model. The aim is to verify whether the series have a stationary trend, and, if non-stationary, to establish orders of integration. The study used both Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) tests to test for stationarity. The test results of the unit roots (intercept only) are presented in Table 4.3.

Table 4.3: Unit root test using ADF and PP tests

Variable	ADF test	PP test	1% Level	5% Level	10% Level	MacKinnon approximate p-value for Z(t)	Comment
GDP	-6.322	-6.335	-3.574	-2.927	-2.598	0.0000	Stationary
FDI	-5.296	-5.286	-3.574	-2.927	-2.598	0.0000	Stationary
MR	-2.733	-2.738	-3.574	-2.927	-2.598	0.0676	Non-Stationary
FA	-3.512	-4.276	-3.574	-2.927	-2.598	0.0005	Stationary
GB	-1.349	-1.515	-3.574	-2.927	-2.598	0.5261	Non-Stationary

The results obtained indicated that all variables are stationary (i.e. presence of unit roots) except for GB and MR at 1%, 5% and 10% levels of significance. This calls for differencing of all variables to make convert them into one level. Table 4.4 shows the Unit root results after first difference for all variables. This implies that all the variables become stationary on first difference.

Table 4.4: Unit root tests-First Differencing

Variable	ADF test	PP test	1% Level	5% Level	10% Level	MacKinnon approximate p-value for Z(t)	Comment
DGDP	-11.037	-13.459	-3.574	-2.927	-2.598	0.0000	Stationary
DFDI	-10.357	-12.503	-3.574	-2.927	-2.598	0.0000	Stationary
DMR	-7.212	--7.300	-3.576	-2.928	-2.599	0.0000	Stationary
DFA	-8.129	-8.318	-3.574	-2.927	-2.598	0.0000	Stationary
DGB	-4.760	--4.671	-3.576	-2.928	-2.599	0.0000	Stationary

4.3.2 Optimal Information Criterion using AIC

The study conducted an ARDL regression using Akaike Information Criterion (AIC) to determine the optimal lag length. AIC was chosen as the test for optimal lag length because of its ability to give efficient estimates. The findings on Table 4.5 below show the estimates of the ARDL regression using AIC. From the findings, the AIC estimates are small, thereby implying that AIC can be used to select the optimal lag.

Table 4.5: Optimal Information Criterion

Optimal Information Criterion ARDL Regression Sample: 1966 – 2017				
Variable	Coefficient	Std. Error	T	P>|t|
DGDP	-.2328076	.144186	-1.61	0.115
DFDI	.2030054	.6844334	0.30	0.769
DMR	.2828309	.6372756	0.44	0.660
DFA	-.2475055	.2100155	-1.18	0.247
DGB	-.248308	.3194627	-0.78	0.442
Cons	-.0005544	.0055739	-0.10	0.921

4.3.3 ARDL Co-integration Test Results

The study used the Pesaran, Shin and Smith (2001) critical values F statistic tests to test for co-integration among the variables. The findings in Table 4.6 below show that the F and t statistics are greater than the Pesaran, Shin and Smith (2001) upper critical values I (1) and lower critical I (0) values at 10 percent, 5 percent and 1 percent significant levels and thus the null hypothesis of no co-integration is rejected, and this implies that there is co-integration among the variables and therefore long run relationship among the variables.

Table 4.6: Pesaran, Shin & Smith (2001) Co-Integration tests

	10%		5 %		1%	
Pesaran, Shin & Smith (2001) critical values, t statistic	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
	-2.57	-3.66	-2.86	-3.99	-3.43	-4.60
Pesaran, Shin & Smith (2001) critical values, F statistic	2.45	3.52	2.86	4.01	3.74	5.06
F statistic	11.128					
T statistic	-7.263					
K (4): no of independent variables – DFDI, DFA, DMR & DGB						

Since the co-integration tests (Pesaran, Shin and Smith (2001) upper critical values) showed co-integration, vector error correction model was adopted in the study for all variables using each variable as the dependent variable. Since the variables in the model linking every variable to the determinants are co-integrated, then an error-correction model can be specified to link the short-run and the long-run relationships. The results for the vector error correction models are presented in Table 4.7- Table 4.11.

4.3.4 ARDL Error correction Model

4.3.4.1 Error correction results for GDP

Table 4.7 below presented the long run and short run results. The R squared of the model was 0.8932 which indicated that there was overall goodness of fit for the model (89.32%). Long run DFDI was positive but insignificantly related to long run DGDP (beta coefficient = .2347; p-value=0.723). Long run DMR was positively but insignificantly related to long run DGDP (beta coefficient=.1183; p-value=0.661). Long run DFA was negatively but insignificantly related to Long run DGDP (beta coefficient= -.0137; p-value=0.927). Long

run DGB was negatively but insignificantly related to Long run DGDP (beta coefficient= -.1039; p-value=0.428).

Table 4.7: Vector Error Correction Model for GDP

D.DGDP		LR	SR	Diagnostic Tests Results
ADJDGDP *L1* *LD* *L2D* *L3D*	-2.3891*** (0.000)		 1.156***(0.000) .6459***(0.003) .3748***(0.001)	BG LM = 0.0022<0.05 BP = 0.0441<0.05 MVIF = 1.04<5 SWILK = DGDP, DFDI, DMR, DFA, DGB <0.05 Ramsey Reset = 0.5116<0.05 Cusum squared test=parameter stability
DFDI *D1* *LD*		.2347 (0.723)	 -.3578(0.755) -.9247(0.193)	
DMR		.1183 (0.661)		
DFA *D1* *LD* *L2D* *L3D*		-.0137 (0.927)	 -.2147(0.429) .1628(0.453) -.2509(0.127) .2494*(0.084)	
DGB		-.1039 (0.428)		
Constant	-.00055(0.921)			
No. of observations = 50 Root MSE = 0.0337 Adj R-squared = 0.8505 R Squared = 0.8932 Sample: 1968 – 2017				

Holding all factors constant, the effect of DFDI, DMR, DFA and DGB is 89.32%. The short run relationship represents the disequilibrium caused by short run shocks of the previous period towards long run value. 1% increase in DGDP results to an increase in

GDP by 115.6% and significant at LD, an increase in GDB by 64.59% at L2D and significant as well as increase by 37.48% at L3D and significant. Additionally, 1% increase in DFDI results in a decrease in GDP by 35.7% at D1 and insignificant and 1% increase in DFDI results in a decrease in GDP by 92.47% at LD and insignificant. 1% increase in DFA results in a decrease in GDP by 21.47% at D1 and insignificant, decrease in GDP by 16.28% and insignificant at LD, decrease in GDP by 25.09% at L2D and insignificant and an increase in GDP by 24.94% at L3D and significant. The coefficient (-2.3891) shows that a 1 percent increase in random shocks to equilibrium will lead to 238.91% correction in the equilibrium.

After the vector error correction test, diagnostic tests are administered and the findings are presented in Table 4.7 The model has passed the tests for omitted variable bias. There is also no multicollinearity where MVIF is more than 1 and less than 5 and null hypothesis is accepted. There is non-normality in DGDP, DFDI, DMR, DFA and DGB.

4.3.4.2 Model Stability for GDP

Further, the model stability was conducted in the study as presented in Figure 4.6. The findings for the model stability diagnostic tests are as shown by the Cusum squared test. Figure 4.6 below shows the findings for the Cusum squared test. The model has passed the stability diagnostic test though there are some deviations in the upper bound line and this implies that there is variables stability because the line generated is within the upper bound and lower bound lines of 5% significance level in the Cusum squared test.

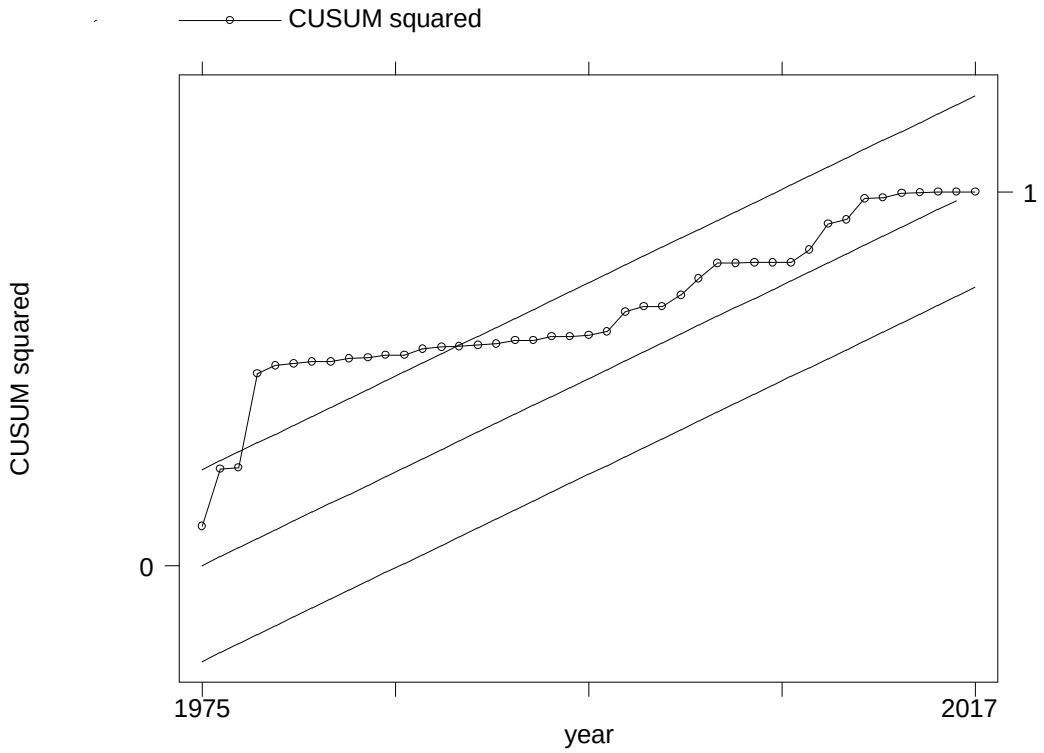

Figure 4.6 Cusum Squared Test for GDP

4.3.4.3 Error correction results for FDI

Table 4.8 below presented the long run and short run results. The R squared of the model was 0.7814 which indicated that there was overall goodness of fit for the model. This implies that 78.14% of the variability in DFDI can be attributed to DGDP, DFA, DMR and DGB. Long run DGDP was negatively but insignificantly related to long run DFDI (beta coefficient = -.00361; p-value=0.721). Long run DMR was positively but insignificantly related to long run DFDI (beta coefficient=.01962; p-value=0.789). Long run DFA was positively but insignificantly related to Long run DFDI (beta coefficient= .000220; p-value=0.215). Long run DGB was positively but insignificantly related to Long run DFDI (beta coefficient= .0301; p-value=0.505).

The relationship between the short run DFDI and short run FDI show that an increase in the short run DFDI by 1% increases the FDI by 66.18% and significant at LD and also increase FDI by 30.9% and significant at L2D. Further, 1% increase in DGB increases FDI by 2.58% and insignificant at D1 while decreases FDI by 12.64% and insignificant at LD. The coefficient (-2.0969) shows that a 1 percent increase in random shocks to equilibrium will lead to 209.69% correction in the equilibrium.

Table 4.8: Vector Error Correction Model for FDI

D.DFDI		LR	SR	Diagnostic Tests Results
ADJDFDI *L1* *LD* *L2D*	-2.0969*** (0.000)		 .6618**(0.014) .3090**(0.044)	BG LM = 0.0142<0.05 BP = 0.1685>0.05 MVIF = 1.02<5 SWILK = DFDI, DGDP, DMR, DFA, DGB <0.05 Ramsey Reset = 0.1266>0.05 Cusum squared test=parameter stability
DGDP		-.00361 (0.721)		
DMR		.01962 (0.789)		
DFA		.00220 (0.215)		
DGB *D1* *LD*		.0301 (0.505)	 .0258(0.758) -.1264(0.100)	
Constant	0.0000532 (0.961)			
No. of observations = 50 Adj R-squared = 0.7322 R Squared = 0.7814 Root MSE = 0.0074				

After the vector error correction test, diagnostic tests are administered and the findings are presented in Table 4.8. The model has passed the tests for heteroscedasticity and omitted variable bias. There is also no multicollinearity where MVIF is more than 1 and

less than 5 and null hypothesis is accepted. There is non-normality in DFDI, DGDP, DMR, DFA and DGB.

4.3.4.4 Model Stability for FDI

Further, the model stability was conducted in the study as presented in Figure 4.7 below. The findings for the model stability diagnostic tests are as shown by the Cusum squared test. The model has passed the stability diagnostic test and therefore there is variables stability because the line generated is within the upper bound and lower bound lines of 5% significance level in the Cusum squared test though there is a slight deviation in the lower bound.

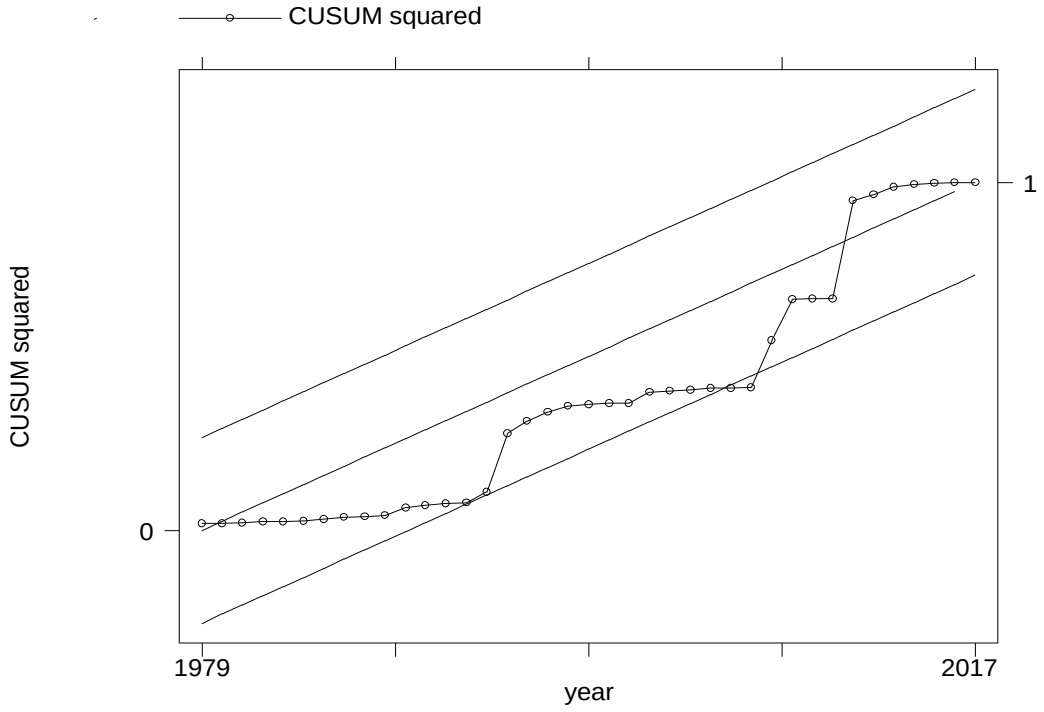

Figure 4.7 Cusum Squared Test for FDI

4.3.4.5 Error correction results for MR

Table 4.9 below shows the long run and short run results for DMR. The R squared of the model was 0.8333 which indicated that there was overall goodness of fit for the model. This implies that 83.33% of the variability in DMR can be attributed to DGDP, DFDI, DFA and DGB.

Long run DGDP was negative but insignificantly related to long run DMR (beta coefficient = -.00479; p-value=0.540). Long run DFDI was positively but insignificantly related to long run DMR (beta coefficient=.08720; p-value=0.690). Long run DFA was positively but significantly related to Long run DMR (beta coefficient= .00952; p-value=0.496). Long run DGB was positively but insignificantly related to Long run DMR (beta coefficient= .00925; p-value=0.842).

The relationship between the short run DMR and short run MR show that an increase in the short run DMR by 1% increases the MR by 89.23% and significant at LD, an increase in the short run DMR by 1% increases the MR by 83.18% and significant at L2D and that an increase in the short run DMR by 1% increases the MR by 54.81% and significant at L3D. Further, an increase in the short run DFDI by 1% decreases the MR by 21.69% and insignificant at D1, an increase in the short run DFDI by 1% decreases the MR by 14.26% and insignificant at LD, an increase in the short run DFDI by 1% decreases the MR by 17.19% and insignificant at L2D, and an increase in the short run DFDI by 1% decreases the MR by 26.01% and insignificant at L3D.

In addition, an increase in the short run DGB by 1% increases the MR by 5.56% and insignificant at D1, an increase in the short run DGB by 1% increases the MR by 2.05%

and insignificant at LD, an increase in the short run DGB by 1% decreases the MR by 11.37% and insignificant at L2D, and an increase in the short run DGB by 1% decreases the MR by 13.09% and significant at L3D. The coefficient (-2.109) shows that a 1 percent increase in random shocks to equilibrium will lead to 210.9% correction in the equilibrium.

Table 4.9: Vector Error Correction Model for MR

D.DMR		LR	SR	Diagnostic Tests Results
ADJDMR *L1* *LD* *L2D* *L3D*	-2.1091*** (0.000)		 .8923***(0.000) .8318***(0.000) .5481***(0.000)	BG LM = 0.9025>0.05 BP = 0.0224<0.05 MVIF = 1.04<5 SWILK = DMR, DGDP, DFDI, DFA, DGB <0.05 Ramsey Reset = 0.6320>0.05 Cusum squared test=parameter stability
DGDP		-.00479(0.540)		
DFDI *D1* *LD* *L2D* *L3D*		.08720(0.690)	 -.2169(0.593) -.1426(0.798) -.1719(0.453) -.2601**(0.046)	
DFA		.00925(0.496)		
DGB *D1* *LD* *L2D* *L3D*		.00952(0.842)	 .0556(0.543) .0205(0.798) -.1137(0.113) -.1309*(0.061)	
Constant	0.00085 (0.314)			
No. of observations = 50 Adj R-squared = 0.7525 R Squared = 0.8333 Root MSE = 0.0057				

After the vector error correction test, diagnostic tests are administered and the findings are presented in Table 4.9. The model has passed the tests for autocorrelation,

heteroscedasticity, multicollinearity and omitted variable bias. There is non-normality in DMR, DGDP, DFDI, DFA and DGB.

4.3.4.6 Model Stability for MR

The model stability was conducted in the study as presented in Figure 4.9 below. The findings for the model stability diagnostic tests are as shown by the Cusum squared test. The model has passed the stability diagnostic test and therefore there is variables stability because the line generated is within the upper bound and lower bound lines of 5% significance level in the Cusum squared test though there is a slight deviation in the upper and lower bounds.

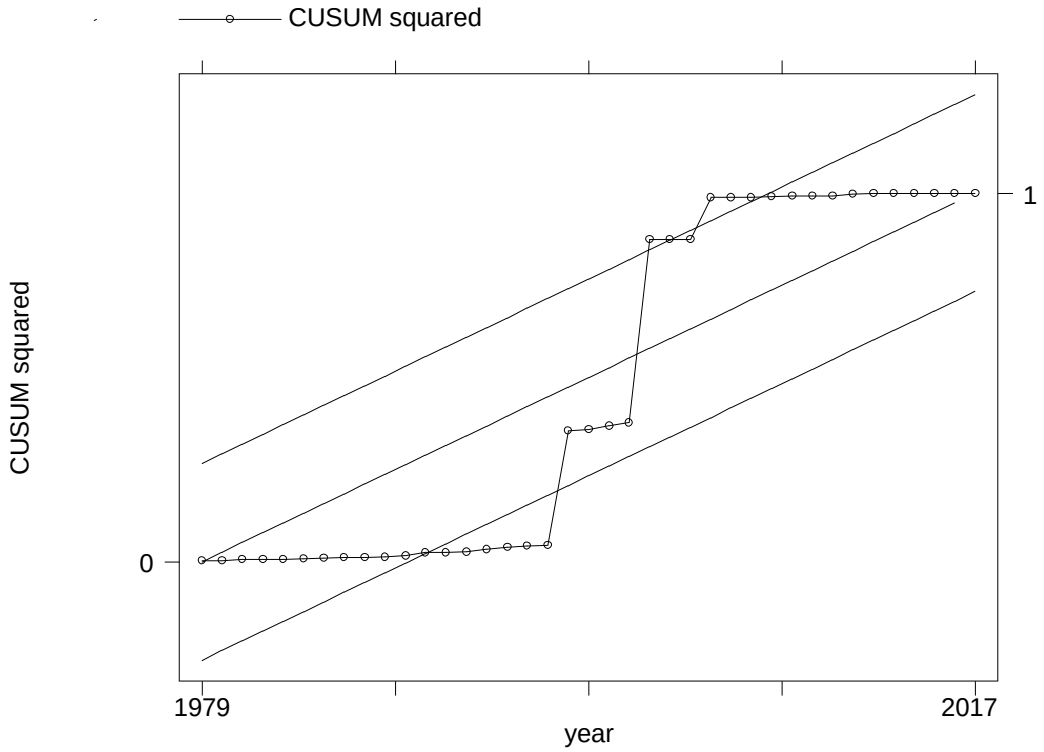

Figure 4.9 Cusum Squared Test for MR

4.3.4.7 Error correction results for FA

Table 4.10 below presented the long run and short run results for DFA. The R squared of the model was 0.8556 which indicated that there was overall goodness of fit for the model. This implies that 85.56% of the variability in DFA can be attributed to DGDP, DFDI, DMR and DGB. Long run DGDP was negatively but insignificantly related to long run DFA (beta coefficient = -.2699; p-value=0.059). Long run DFDI was positively but insignificantly related to long run DFA (beta coefficient=1.2080; p-value=0.255). Long run DMR was positively but insignificantly related to Long run DFA (beta coefficient= .01946; p-value=0.648). Long run DGB was positively but insignificantly related to Long run DFA (beta coefficient= .3156; p-value=0.113).

Table 4.10: Vector Error Correction Model for FA

D.DFA		LR	SR	Diagnostic Tests Results
ADJDFA *L1* *LD* *L2D*	-1.1167*** (0.000)		 .0392 (0.732) -.2398**(0.019)	BG LM = 0.4374>0.05 BP = 0.1366>0.05 MVIF = 1.02<5 SWILK = DFA, DGDP, DMR, DFDI, DGB <0.05 Ramsey Reset = 0.9333>0.05 Cusum squared test=parameter stability
DGDP *D1*		-.2699(0.059)	 .1171(0.132)	
DFDI *D1* *LD*		1.2080(0.255)	 -.3132(0.711) -.7715(0.130)	
DMR		.1946(0.648)		
DGB		.3156(0.0.113)		
Constant	-.006354 (0.120)			
No. of observations = 50 Adj R-squared = 0.8186 R Squared = 0.8556				

Root MSE = 0.0253

The relationship between the short run DFA and short run FA show that an increase in the short run DFA by 1% increases the FA by 3.92% and insignificant at LD, an increase in the short run DFA by 1% decreases the FA by 23.98% and significant at L2D. An increase in short run DGDP by 1% increases FA by 11.71% and insignificant at D1. Further, an increase in short run DFDI by 1% decreases FA by 31.32% and insignificant at D1 while an increase in short run DFDI by 1% decreases FA by 77.15% and insignificant at LD. The coefficient (-1.1167) shows that a 1 percent increase in random shocks to equilibrium will lead to 111.67% correction in the equilibrium.

After the vector error correction test, diagnostic tests are administered and the findings are presented in Table 4.10. The model has passed the tests for autocorrelation, heteroscedasticity, multicollinearity and omitted variable bias. There is non-normality in DFA, DGDP, DFDI, DMR and DGB.

4.3.4.8 Model Stability for FA

The model stability was conducted in the study as presented in Figure 4.10 below. The findings for the model stability diagnostic tests are as shown by the Cusum squared test. The model has passed the stability diagnostic test and therefore there is variables stability because the line generated is within the upper bound and lower bound lines of 5% significance level in the Cusum squared test though there is a slight deviation in the upper bound.

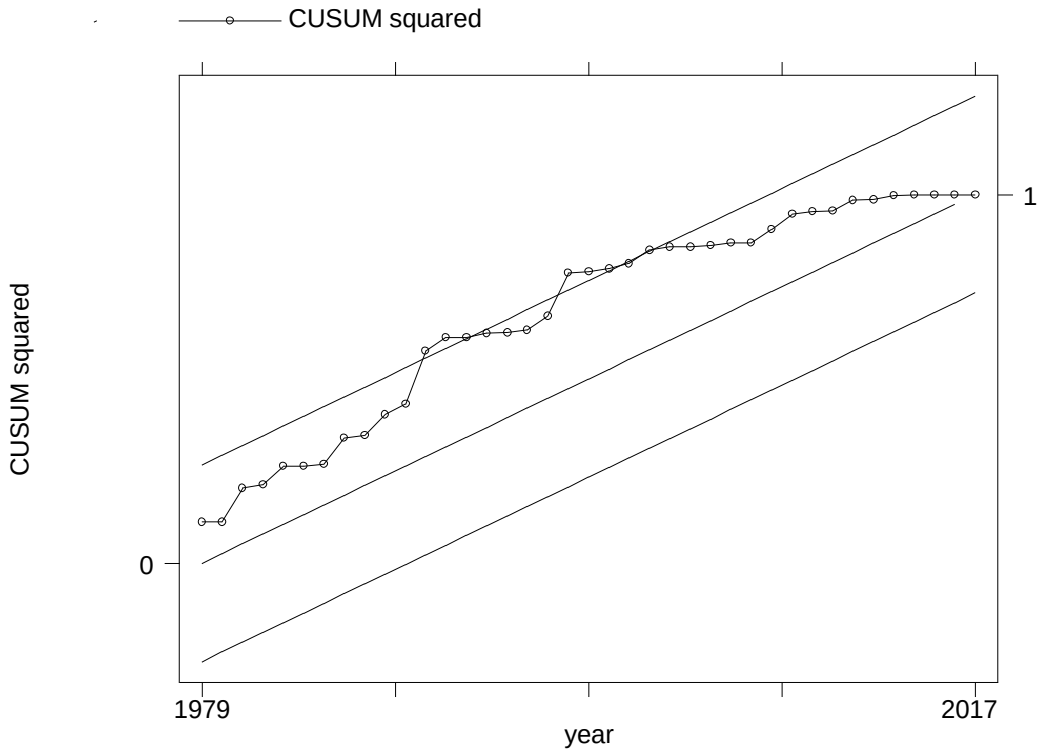

Figure 4.10 Cusum Squared Test for FA

4.3.4.9 Vector error correction results for GB

Table 4.11 below presented the long run and short run results for DGB. The R squared of the model was 0.5298 which indicated that there was overall goodness of fit for the model. This implies that 52.98% of the variability in DGB can be attributed to DGDP, DFDI, DMR and DFA. Long run DGDP was negatively but insignificantly related to long run DGB (beta coefficient = -.02686; p-value=0.184). Long run DFDI was positively but insignificantly related to long run DGB (beta coefficient=.4884; p-value=0.644). Long run DMR was negatively but insignificantly related to Long run DGB (beta coefficient= -.0136; p-value=0.977). Long run DFA was positively but insignificantly related to Long run DGB (beta coefficient= .2609; p-value=0.081).

The relationship between the short run DGB and short run GB show that an increase in the short run DGB by 1% increases the FA by 424.92% and insignificant at LD. Further, an increase in the short run DGDP by 1% increases GB by 12.32% and insignificant at D1, an increase in the short run DGDP by 1% increases the GB by 9.56% and significant at LD. In addition, an increase in the short run DFDI by 1% increases the GB by 7.58% and insignificant at D1 and an increase in the short run DFDI by 1% increases the GB by 39.88% and insignificant at LD. The coefficient (-.6646) shows that a 1 percent increase in random shocks to equilibrium will lead to 66.46% correction in the equilibrium.

Table 4.11: Vector Error Correction Model for GB

D.DGB		LR	SR	Diagnostic Tests Results
ADJDGB *L1* *LD*	-.6646*** (0.000)		 .2492 (0.112)	BG LM = 0.0023<0.05 BP = 0.0220<0.05 MVIF = 1.04<5 SWILK = DFA, DGDP, DMR, DFDI, DGB <0.05 Ramsey Reset = 0.008<0.05 Cusum squared test=parameter stability
DGDP *D1* *LD*		-.2686(0.184)	 .1232(0.150) .09569**(0.046)	
DFDI *D1* *LD*		.4884(0.644)	 .0758(0.881) .3988(0.173)	
DMR		-.0136(0.977)		
DFA		.2609*(0.081)		
Constant	.001545 (0.483)			
No. of observations = 50 Adj R-squared = 0.4093 R Squared = 0.5298 Root MSE = 0.0151				

After the vector error correction test, diagnostic tests are administered and the findings are presented in Table 4.10. The model has passed the tests for multicollinearity. There is non-normality in DFA, DGDP, DFDI, DMR and DGB.

4.3.4.10 Model Stability for GB

The model stability was conducted in the study as presented in Figure 4.11 below. The findings for the model stability diagnostic tests are as shown by the Cusum squared test. The model has passed the stability diagnostic test and therefore there is variables stability because the line generated is within the upper bound and lower bound lines of 5% significance level in the Cusum squared test.

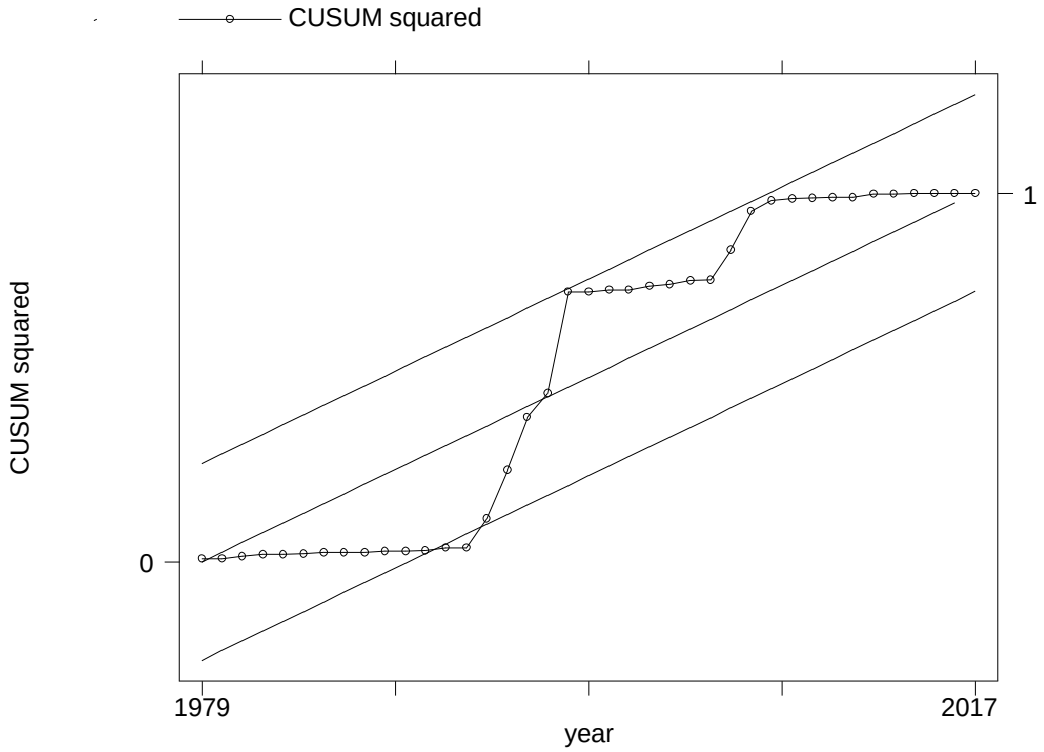

Figure 4.11 Cusum Squared Test for GB

4.4 Robustness check

The findings of the ARDL bounds test approach in section 4.3 were tested for robustness and consistency using the Johansen co-integration test and VECM approach. Robustness check helps to determine if there is any consistency in the findings of the ARDL bounds test approach and the findings of the Johansen co-integration and VECM approach.

4.4.1 Unit root test

The first step is to determine the unit root results and ensure the variables are I (1) at first difference as shown in Table 4.12 below. The findings in Table 4.12 below show that the variables are at first difference I (1) using the Phillips Perron (1988) test which allows for automatic correction to the Dickey fuller procedure for auto correlated residuals. The findings are similar to the ARDL.

Table 4.12 Unit Root Tests

Variable	PP test	1% Level	5% Level	10% Level	MacKinnon approximate p-value for Z(t)	Comment
DGDP	-13.459	-3.574	-2.927	-2.598	0.0000	Stationary
DFDI	-12.503	-3.574	-2.927	-2.598	0.0000	Stationary
DMR	--7.300	-3.576	-2.928	-2.599	0.0000	Stationary
DFA	-8.318	-3.574	-2.927	-2.598	0.0000	Stationary
DGB	--4.671	-3.576	-2.928	-2.599	0.0000	Stationary

4.4.2 Optimal lag length Selection

The findings in Table 4.13 below show that AIC is the optimal lag length at lag 1. It has the smallest value and gives efficient estimates and is a superior method. Hence, lag 1 is chosen as an optimal lag.

Table 4.12 Lag Selection

Lag Selection Order Criterion Sample: 1966 – 2017			
Lag	AIC	HQIC	SBIC
1	-24.8868*	-24.4552	-23.761
2	-24.7521	-23.9609	-22.6883

The findings in Table 4.5 also show that AIC is the optimal lag length at lag 1. Therefore, lag 1 is chosen as an optimal lag.

4.4.3 Johansen Co-integration Test

The Johansen Co-integration test was also conducted since it is more accurate and superior to Engle granger test of Co-integration. Johansen results obtained indicate that the trace statistic is higher than the critical values at 5 percent significance level. The findings show some consistency with the ARDL bounds test approach because the ARDL model would only be inappropriate if there were multiple co-integrating vectors as shown in Table 4.13.

Table 4.13: Johansen Co-integration Test

Johansen tests for co-integration

Trend: constant — Number of obs = 53

Sample: 1965 - 2017 — Lags = 1

Maximum Rank	Parms	LL	Eigenvalue	Trace Statistic	5% Critical Value
0	5	568.07896		246.5989	68.52
1	14	605.08419	0.75252	172.5884	47.21
2	21	639.24924	0.72452	104.2583	29.68
3	26	662.37761	0.58221	58.0016	15.41
4	29	681.95201	0.52224	18.8528	3.76
5	30	691.3784	0.29933		

Maximum Rank	Parms	LL	Eigenvalue	Max Statistic	5% Critical Value
0	5	568.07896		74.0105	33.46
1	14	605.08419	0.75252	68.3301	27.07
2	21	639.24924	0.72452	46.2567	20.97
3	26	662.37761	0.58221	39.1488	14.07
4	29	681.95201	0.52224	18.8528	3.76
5	30	691.3784	0.29933		

After the Johansen co-integration test, the next step is to determine the coefficients and the error correction term using the Error Correction Model.

4.4.4 Vector error correction model

The findings of the VECM in Table 4.14 below shows there is consistency in the results for both the ARDL model and VECM for DGDP where the co-integrating equation one has an error correction term with the value (-2.3891) for the ARDL model and (-.5909) for the VECM.

Table 4.14 Vector error correction model

Vector Error-Correction Model Sample: 1966 - 2017 Number of obs = 52 AIC = -22.96027 Log likelihood = 635.9671 HQIC = -22.39923 SBIC= -21.49684					
Equation	Parms	RMSE	R-sq	Chi-sq	p>chi^2
D1DGDP	7	.050022	0.7520	136.4528	0.0000
D1DFDI	7	.010916	0.4658	39.23973	0.0000
D1DMR	7	.010664	0.2075	11.78081	0.1080
D1DFA	7	.065161	0.3430	23.49473	0.0014
D1DGB	7	.019361	0.1094	5.529394	0.5956
D1DGDP Ce1 *L1* -1.5909*** Ce2 *L1* 0.000		D1FDI Ce1 *L1* .0896253 Ce2 *L1* 0.078		D1DMR Ce1 *L1* .0091372 Ce2 *L1* 0.854	
D1FA Ce1 *L1* -.1791294 Ce2 *L1* 0.555		D1DGB Ce1 *L1* -.0501535 Ce2 *L1* 0.578			

4.4.5 Post estimation tests

4.4.5.1 Normality of residuals

Table 4.14 below presents the test for normality of the variables used in the study. The Shapiro-Wilk test for normality is thus used to determine whether the variables are normally distributed or not. The null hypothesis in this case is that the variables are not significantly different from a normal distribution. The Shapiro-Wilk probability value of all

the variables in this case is less than that the critical 5 percent and thus they are significant implying that the variables are not normally distributed.

Table 4.14 Normality Tests

Variable	Obs	W	V	z	Prob
DGDP	54	0.78596	10.698	5.077	0.0000
DFDI	54	0.83307	8.343	4.545	0.0000
DMR	54	0.59252	20.365	6.456	0.0000
DFA	54	0.82459	8.767	4.651	0.0000
DGB	54	0.80110	9.941	4.920	0.0000

4.4.5.2 Estimating Impulse response functions

Table 4.15 on impulse response in the appendices shows the findings of the impulse response functions which were estimated by setting 8 as the forecast horizon. The values represent the effect of the variables on themselves and on other variables from period zero to 8.

Table 4.15 Impulse response functions

step	(21) oirf	(22) oirf	(23) oirf	(24) oirf	(25) oirf
0	0	0	0	0	.01734
1	-.006111	-.010479	.000791	-.003582	.014777
2	-.001808	-.000379	.000034	-.001226	.013578
3	-.000243	-.006473	.000485	-.002271	.014998
4	-.004871	-.004659	.000313	-.001957	.014175
5	-.001519	-.00391	.000333	-.001934	.014426
6	-.002029	-.005148	.000355	-.002062	.014489
7	-.003185	-.004563	.000344	-.001958	.01436
8	-.002095	-.004462	.000338	-.001995	.014427
9	-.002362	-.004779	.000348	-.002006	.01443
10	-.002668	-.004607	.000344	-.001985	.014402
11	-.002325	-.004582	.000342	-.001995	.014419
12	-.00243	-.004679	.000345	-.001997	.01442
13	-.002514	-.004621	.000344	-.001991	.014411
14	-.002405	-.004618	.000343	-.001994	.014417
15	-.002444	-.004647	.000344	-.001995	.014417
16	-.002466	-.004628	.000344	-.001993	.014414
17	-.002432	-.004628	.000344	-.001994	.014416
18	-.002446	-.004637	.000344	-.001994	.014416
19	-.002452	-.00463	.000344	-.001993	.014415
20	-.002441	-.004631	.000344	-.001994	.014416

step	(11) oirf	(12) oirf	(13) oirf	(14) oirf	(15) oirf	(16) oirf	(17) oirf	(18) oirf	(19) oirf	(20) oirf
0	0	0	.010527	.001751	.003395	0	0	0	.010319	.005405
1	.002704	-.001269	.006065	-.00026	.002235	.007392	-.007891	.000909	.002425	.008402
2	.000526	-.000269	.0079	.001224	.002277	.01449	-.002178	.000088	.005616	.005478
3	.000516	-.000903	.007172	.000417	.002493	.006248	-.007403	.000624	.004768	.007114
4	.00151	-.000263	.007446	.000782	.002303	.007259	-.003581	.000357	.004951	.006236
5	.000947	-.000885	.007348	.000623	.002439	.011209	-.004752	.000429	.004912	.006677
6	.000775	-.000503	.007386	.000696	.002347	.007659	-.005631	.000454	.004865	.006571
7	.001218	-.000579	.007366	.000666	.002396	.008376	-.004332	.000415	.004965	.006473
8	.000959	-.000677	.007379	.000671	.002384	.009558	-.004951	.00043	.00488	.006607
9	.000943	-.000575	.007372	.000677	.002376	.00834	-.005069	.000436	.00491	.006541
10	.001076	-.000604	.007374	.000671	.002386	.008681	-.004706	.000425	.004924	.006534
11	.000986	-.000629	.007374	.000672	.002383	.008999	-.004913	.00043	.0049	.006567
12	.00099	-.000598	.007374	.000674	.002381	.008611	-.004931	.000432	.004911	.006547
13	.001029	-.000609	.007374	.000672	.002384	.008744	-.004823	.000428	.004914	.006546
14	.000999	-.000615	.007374	.000673	.002382	.008828	-.004892	.00043	.004907	.006556
15	.001002	-.000605	.007374	.000673	.002382	.008705	-.004892	.000431	.004911	.006549
16	.001014	-.000609	.007374	.000673	.002383	.008755	-.00486	.000429	.004911	.00655
17	.001004	-.000611	.007374	.000673	.002382	.008776	-.004883	.00043	.004909	.006552
18	.001006	-.000608	.007374	.000673	.002382	.008738	-.004882	.00043	.00491	.00655
19	.001009	-.000609	.007374	.000673	.002383	.008756	-.004872	.00043	.00491	.00655
20	.001006	-.00061	.007374	.000673	.002382	.008761	-.00488	.00043	.00491	.006551

step	(1) oirf	(2) oirf	(3) oirf	(4) oirf	(5) oirf	(6) oirf	(7) oirf	(8) oirf	(9) oirf	(10) oirf
0	.050022	-.021	-.001188	.001279	-.004425	0	.061685	.001219	.002826	.003721
1	-.013789	-.026973	-.000135	.002733	-.004231	.001767	.029783	.000955	.002248	.005212
2	.00666	-.009703	-.00091	.002572	-.005154	-.026356	.04049	.001303	.002711	.003418
3	.022353	-.019587	-.000626	.0019	-.003594	-.000791	.044925	.00081	.002691	.003992
4	.001574	-.021012	-.000528	.002269	-.004472	-.007093	.036586	.001207	.00223	.00457
5	.009054	-.014979	-.000724	.002465	-.004611	-.014501	.040876	.001044	.002723	.003718
6	.013466	-.018853	-.000625	.002085	-.00404	-.006112	.041528	.001026	.002536	.00416
7	.006742	-.018813	-.000607	.002287	-.00442	-.008758	.039073	.001094	.002442	.004202
8	.009556	-.017041	-.000666	.002317	-.004401	-.010752	.040562	.00106	.002606	.003973
9	.010656	-.018346	-.000632	.002198	-.004239	-.008074	.040613	.001051	.002524	.004121
10	.008549	-.018224	-.00063	.002272	-.004366	-.009084	.039891	.001074	.00251	.004118
11	.009559	-.017707	-.000647	.002273	-.004349	-.009599	.040386	.001061	.002557	.004053
12	.00981	-.018136	-.000635	.002238	-.004303	-.008758	.040365	.00106	.00253	.0041
13	.009159	-.018067	-.000636	.002263	-.004344	-.009125	.04015	.001067	.002528	.004096
14	.009512	-.017917	-.000641	.002261	-.004336	-.009252	.040315	.001063	.002542	.004077
15	.00956	-.018057	-.000637	.002251	-.004322	-.00899	.040296	.001062	.002533	.004093
16	.009361	-.018026	-.000637	.002259	-.004336	-.00912	.040233	.001065	.002533	.00409
17	.009483	-.017983	-.000639	.002258	-.004332	-.009148	.040287	.001063	.002537	.004085
18	.009488	-.018029	-.000638	.002255	-.004329	-.009067	.040277	.001063	.002534	.00409
19	.009427	-.018016	-.000638	.002258	-.004333	-.009112	.040259	.001064	.002534	.004089
20	.009469	-.018004	-.000638	.002257	-.004331	-.009117	.040277	.001063	.002536	.004087

step	(21) oirf	(22) oirf	(23) oirf	(24) oirf	(25) oirf
0	0	0	0	0	.01734
1	-.006111	-.010479	.000791	-.003582	.014777
2	-.001808	-.000379	.000034	-.001226	.013578
3	-.000243	-.006473	.000485	-.002271	.014998
4	-.004871	-.004659	.000313	-.001957	.014175
5	-.001519	-.00391	.000333	-.001934	.014426
6	-.002029	-.005148	.000355	-.002062	.014489
7	-.003185	-.004563	.000344	-.001958	.01436
8	-.002095	-.004462	.000338	-.001995	.014427
9	-.002362	-.004779	.000348	-.002006	.01443
10	-.002668	-.004607	.000344	-.001985	.014402
11	-.002325	-.004582	.000342	-.001995	.014419
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13	-.002514	-.004621	.000344	-.001991	.014411
14	-.002405	-.004618	.000343	-.001994	.014417
15	-.002444	-.004647	.000344	-.001995	.014417
16	-.002466	-.004628	.000344	-.001993	.014414
17	-.002432	-.004628	.000344	-.001994	.014416
18	-.002446	-.004637	.000344	-.001994	.014416
19	-.002452	-.00463	.000344	-.001993	.014415
20	-.002441	-.004631	.000344	-.001994	.014416

(1) irfname = vec1, impulse = DGDP, and response = DGDP
(2) irfname = vec1, impulse = DGDP, and response = DFA
(3) irfname = vec1, impulse = DGDP, and response = DMR
(4) irfname = vec1, impulse = DGDP, and response = DFDI
(5) irfname = vec1, impulse = DGDP, and response = DGB
(6) irfname = vec1, impulse = DFA, and response = DGDP
(7) irfname = vec1, impulse = DFA, and response = DFA
(8) irfname = vec1, impulse = DFA, and response = DMR
(9) irfname = vec1, impulse = DFA, and response = DFDI
(10) irfname = vec1, impulse = DFA, and response = DGB
(11) irfname = vec1, impulse = DMR, and response = DGDP
(12) irfname = vec1, impulse = DMR, and response = DFA
(13) irfname = vec1, impulse = DMR, and response = DMR
(14) irfname = vec1, impulse = DMR, and response = DFDI
(15) irfname = vec1, impulse = DMR, and response = DGB
(16) irfname = vec1, impulse = DFDI, and response = DGDP
(17) irfname = vec1, impulse = DFDI, and response = DFA
(18) irfname = vec1, impulse = DFDI, and response = DMR
(19) irfname = vec1, impulse = DFDI, and response = DFDI
(20) irfname = vec1, impulse = DFDI, and response = DGB
(21) irfname = vec1, impulse = DGB, and response = DGDP
(22) irfname = vec1, impulse = DGB, and response = DFA
(23) irfname = vec1, impulse = DGB, and response = DMR
(24) irfname = vec1, impulse = DGB, and response = DFDI
(25) irfname = vec1, impulse = DGB, and response = DGB

The next step in the post estimations test is to graph the orthogonalized impulse response functions as shown in Figure 4.12 below.

4.4.5.3 Orthogonalized impulse response functions

Figure 4.12 below shows the findings for the orthogonalized impulse response functions. The effect of DGDP on itself and DFA shows presence of transitory shocks from period 1 to 15 beyond which the shocks become permanent and insignificant, while the effect of GDP on DFDI and DGB is permanent and insignificant from period 3. In addition, the effect of GDP on DMR is permanent and insignificant from period 10. Further findings are shown in Figure 4.12.

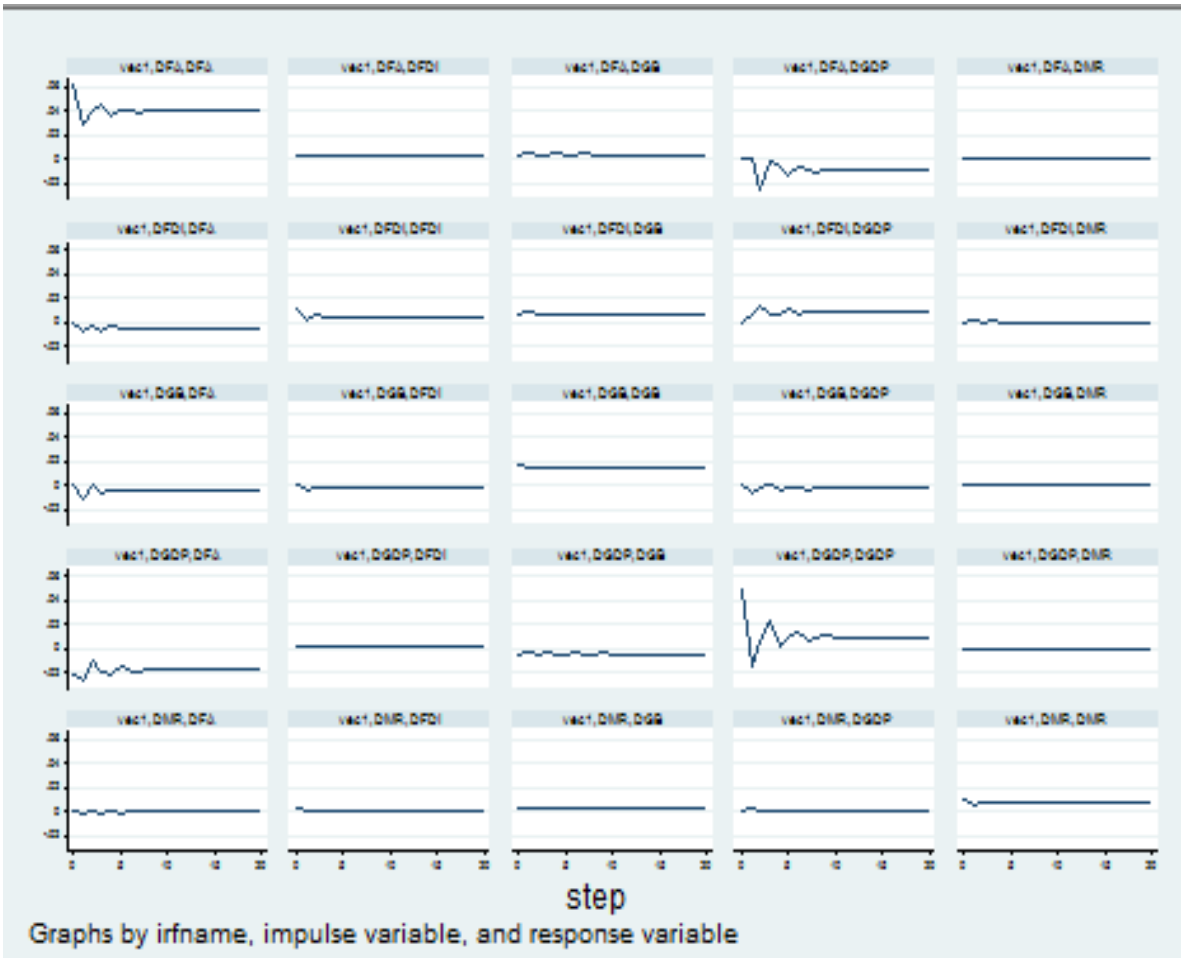

Figure 4.12 Orthogonalized impulse response functions

After the impulse response functions the next step in the post estimations test is to graph the predicted values of the co-integrating equations as shown in Figure 4.13 below.

4.4.5.4 Graph of the predicted values of co-integrating equation

The graph for the predicted values as shown on Figure 4.13 above show that the model is stable, and has the characteristics of a stationary series.

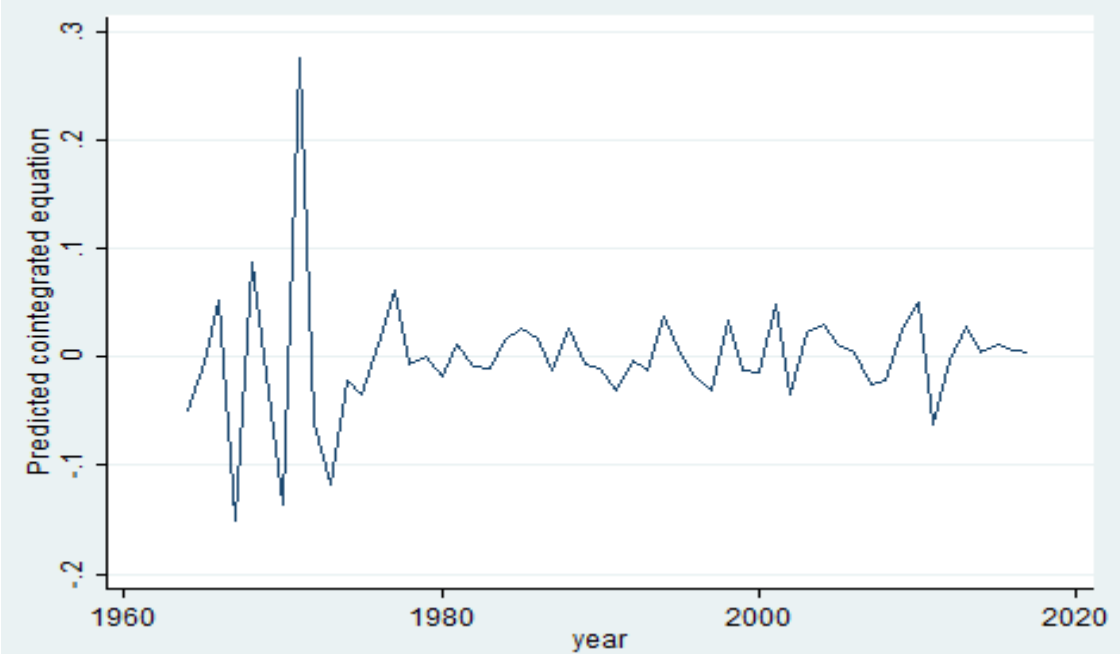

Figure 4.13 Graph of the predicted values of co-integrating equation

After the robustness check and post estimation tests the model is fitted in the next section 4.5.

4.5 Model Fitting

The fitted equations were presented for the short run and long run coefficients as follows.

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

The following models were derived from the error correction models;

DGDP= -.00055+1.156DGDP +.6459DGDP +.3748DGDP +.2347DFDI +.1183DMR -.0137DFA -.1039DGB -2.3891ECT……. equation 1

DFDI= 0.0000532+.6618DFDI +.3090DFDI -.00361DGDP +.01962DMR +.00220DFA +.0301DGB -2.0969ECT……..……. equation 2

DMR= 0.00085+.8923DMR +.8318DMR -.00361DGDP +.5481DMR -.00479DGDP-.2601DFDI +.08720DFDI+.00925DFA -2.1091ECT……. equation 3

DFA= -.006354 -.2398DFA -.2699DGDP +1.2080DFDI +.1946DMR +.3156DGB -1.11671ECT……..……. equation 4

DGB= 0.001545 -.2686DGDP +.0956DGDP +.4884DFDI -.0136DMR +.2609DFA -.66461ECT……...…...……. equation 5

Holding other factors constant, the effect of external financial inflows components on GDP is -0.055%. The coefficients show that DGDP has a positive impact on GDP, FDI has a positive effect on GDP as well which implies that 1% increase in FDI will improve GDP by 37.48%. DMR also has a positive effect on GDP which implies an increase in MR by 1 percent results in an increase GDP by 11.83%, while FA also has a negative effect GDP which implies an increase in FA by 1% results to a decrease GDP by 1.37%. Similarly, DGB has a negative effect on GDP implying that for every 1% increase in DGB, GDP reduces by 10.39%. The error correction term (ECT) is negative meaning 1% increase in random shocks to equilibrium will lead to 238.91% percent correction in the equilibrium.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the findings, conclusions, recommendations for policy action and recommendations for future research. The summary, conclusions and recommendations have been done based on the objectives of the study.

5.2 Summary

The overall objective of the study was to determine the effects of external financial inflows on economic growth in Kenya. Specifically, the study sought to establish the effect of Foreign Direct Investment (FDI) inflows on economic growth, effect of migrant remittances on economic growth, effect of foreign aid inflows on economic growth and the effect of external government borrowing from multilateral sources on economic growth in Kenya. To achieve the objective time series data was compiled for the period 1963-2017 and an ARDL bounds test approach was used to estimate the short run and long run relationships.

5.2.1 Foreign Direct Investment (FDI) Inflows and Economic Growth

The study found that Foreign Direct Investment had a positive and insignificant effect on economic growth, with a 1% increase in Foreign Direct Investment results in an increase in economic growth by 23% in the long run. Thus answering our first research question that there exists a relationship between Foreign Direct Investment and economic growth in Kenya. The short run relationship with Foreign Direct Investment as the dependent variable shows that Foreign Direct Investment has a positive and significant effect on itself with an insignificant effect from Government borrowing from multilaterals.

The findings obtained in this study disagree with those of Wangwe (1995) and Biggs and Srivastava (1996) who argued that FDI does not improve GDP and that there may be limited technology transfer and spillovers to the domestic firms. Nevertheless, Phillips et al. (2000) posited agreed with the current study that FDI leads to an increase in future domestic investment in GDP. In addition, De Mello (1997) and Akinlo (2004) agree with the findings that FDI could engineer or accelerate GDP growth via the infusion of new techniques and managerial efficiency. However, Akinlo disagreed that FDI could worsen the balance of payments (BOP) position, hence affecting GDP negatively.

The findings of the study also agree with those of Caves (1996) who argued that the FDI stems from the belief that FDI has several positive effects. Among these are productivity gains reported by the study was technology transfers, the introduction of new processes, managerial skills and know-how in the domestic market, employee training, international production networks, and access to markets. Philips and Lothgren (2000) also agrees with the present study that FDI as an important vehicle for the transfer of technology, contributing to growth in larger measure than domestic investment.

5.2.2 Migrant Remittances and Economic Growth

The second specific objective was to determine the effect of migrant remittance on economic growth in Kenya. The findings of the study show that Migrant remittance has a positive and insignificant effect on economic growth implying that a percentage increase in Migrant Remittances increases economic growth by 11% in the long run thus answering the research question on what is the effect of migrant remittances on economic growth. The short run relationship when Migrant remittances is the dependent variable show that

migrant remittance has a positive and significant effect on itself at with Foreign Direct Investment having a significant effect on it at lag 3.

The findings of the study agree with the findings Gupta et.al. (2009) and Mim and Ali (2012) who found that remittances have been found to enhance growth through human capital accumulation and can mitigate poverty by increasing the recipient family's income and living standards. Mim and Ali (2012) also argued that remittances are not only relatively stable than other financial flows but also tend to increase during periods of economic depression and natural disasters. Gupta et al. (2009) further supported their findings that remittances can be used to support the capital account of the balance of payments, smooth consumption at the household level; finance development projects, domestic investment, increase the flow of finances during the period of natural disasters at the national level and enhance the capacity to import. The findings further agree with those of Ang (2007) who found that remittances have a positive effect on economic growth.

The findings however disagree with those earlier posited by Gappen Chami and Montiel (2009) that the remittances have no impact on economic growth. In addition, Sidique, Joshi and Lupi (2010) do not support the study findings that there is no causal relationship between economic growth and remittances in and that remittances did not lead to economic growth in Bangladesh and India. Nevertheless, Fayissa and Nsiah (2010) do support these findings by arguing that remittances have a positive and statistically significant effect on the growth of Latin American countries.

5.2.3 Foreign Aid Inflows and Economic Growth

The third specific objective was to analyse the effect of Foreign Aid on economic growth of Kenya. The study found that there was a negative and insignificant relationship between Foreign Aid and economic growth with a percentage increase in Foreign Aid leading to a decrease in economic growth by 1.37% in the long run thus answering the question of what is the effect of Foreign Aid inflows on economic growth in Kenya. The short run relationship with Foreign Aid as the dependent variable shows that Foreign Aid has a negative and significant effect on itself at lag 2 with FDI having an insignificant effect on it.

The study disagrees with the findings of Mosley (1980) and Karras (2006) who found that foreign aid positively affects economic growth. The studies linked the positive correlation to various components which include loans, grants, technical cooperation, multilateral and bilateral aid flows. Similar findings were also posited by Gounder (2001) who also determined that total aid flows and its various forms had positive and significant impacts on economic growth in Fiji.

In addition, other studies such as Morrissey (2001), Bearce and Tirone (2008), Salisu and Ogwumike (2010) and Herzer and Morrissey (2011) have all found out that foreign aid leads to growth. However, other studies such as Gong and Zou (2001), Boakye (2008) and Mallik (2008) found a negative relationship between foreign aid and growth, which agrees with the study findings.

5.2.4 External Government Borrowing from Multilaterals and Economic Growth

The fourth specific objective was to evaluate the effect of external government borrowing from multilateral sources on economic growth in Kenya. The study findings indicated that there is a negative and significant relationship between Government borrowing from multilateral sources and economic growth in Kenya implying that a percentage increase in Government borrowing from multilateral sources decreased economic growth by 10% in the long run. This finding answers the question on what is the effect of Government borrowing from multilateral sources on economic growth in Kenya. The short run relationship with Government borrowing from multilaterals sources as the dependent variable shows that it has an insignificant effect on itself with economic growth having a positive and significant effect on government borrowing from multilateral sources.

The findings of the study disagree with those of by Akomolafe et. al. (2015), Hashibul (2015) who revealed that a significant positive relationship exists between total public debt and investment, and between total public debt and government's reserves. However, their empirical outcomes of their studies also revealed that domestic debt has a negative relationship with domestic investment in both short-run and long-run. Additionally, no strong statistical evidence was found regarding the negative impact of domestic debt and external debt on the GDP growth rate.

The study findings however agree with the findings of Hansen (2001) whose results showed that initial stock of external debt had a negative effect on growth. The study found a significant negative impact of debt service on growth. Further, Muinga (2014) also posited that external debt has an indirect effect on growth through its effect on public

investment while public debt does not appear to depress public investment. Thus, a reduction in debt service would raise public investment.

5.3 Conclusions

The error correction model indicated that FDI, MR, FA, GB explained significant proportion (89.32%) of the variation in GDP. The relationship between FDI and MR with GDP was positive. However, the relationship between FA and GB with GDP was negative. Additionally, holding all factors constant, the effect of FDI, MR, FA and GB is 89.32%. In addition, 1% increase in GDP results to an increase in GDP by 115.6% and significant at LD, an increase in GDB by 64.59% at L2D and significant as well as increase by 37.48% at L3D and significant.

5.3.1 Foreign Direct Investment (FDI) Inflows and Economic Growth

Based on the first objective of the study on the effect of FDI on economic growth (GDP), the study showed that there was a positive relationship between FDI and GDP. This can be concluded to result from efficiency of spillovers to domestic firms (De Mello, 1997). The efficiency level of domestic firms must play a role and that a host country should make use of non-tax instruments such as specification on local content of inputs to enhance its benefits from FDI. It is important to note that FDI is an important component in transfer of technology, however, technology can also result to negative effects on GDP. As observed by Findlay (1978), FDI increases the rate of technical progress in the host country through use of more advanced technology and management practices.

5.3.2 Migrant Remittances and Economic Growth

The findings of the study showed that there was a positive but insignificant relationship between Migrant Remittance and economic growth. The influence of MR on GDP could be attributed to the fact that migrant remittances contribute to economic growth as any other source of income. However, remittances can cause negative effects by recipient households spending more on luxury goods and leaving little for unproductive savings and investment like housing, land and jewelry (Mim & Ali, 2012).

5.3.3 Foreign Aid Inflows and Economic Growth

From the findings, there existed a negative relationship between FA and GDP. The findings can be attributed to the fact that foreign aid is mainly provided with the aim of promoting economic development and social welfare of the recipient countries (IMF,2005) and as such no direct influence on economic growth.

5.3.4 External Government Borrowing from Multilaterals and Economic Growth

As determined by the study, there was a negative relationship between GB and GDP. The decrease in GDP as a result of external government borrowing can be related to the fact that debt service has a crowding-out effect. In addition, high levels of debt depress economic growth as external debt slows growth after reaching a threshold level. Debt increase reduces public investment reduces thus GDP in the process.

5.4 Recommendations for Policy Action

To ensure that external financial inflows positively serve their intended purpose of increasing GDP of the country, the following recommendations are proposed for action.

5.4.1 Foreign Direct Investment (FDI) Inflows and Economic Growth

As the findings of the study showed that an increase in FDI increases GDP in Kenya for the period 1963 to 2017, there could be a number of factors that could be attributed to that such as efficiency of spillovers to domestic firms. To improve GDP from FDI further, the study recommends that technology transfer to firms need to be taken into consideration by the government to ensure that there are spillovers to the domestic firms and therefore GDP of the country can be increased in the process.

The government should also come up with policies that direct Foreign Direct investments into key sectors of the economy, agriculture being one of them with the view of improving on the exports and value addition thus improving economic growth

5.4.2 Migrant Remittances and Economic Growth

As there was a positive relationship between MR and GDP in Kenya, the study recommends that there is need for the Government to put in place policies that will encourage remittances this includes the already established International jobs and Diaspora office in the ministry of foreign Affairs, further to this the government should establish institytions that help recipients of remmittances make the most use of this funds and at the same time provide information to the kenyans in the diaspora on the investment opportunities availabe in the country so as to increase the inflow.

5.4.3 Foreign Aid Inflows and Economic Growth

It was determined that FA was negatively related to GDP in the study. This was a negative finding mainly attributed to Foreign aid being given with the sole aim of improving economic development and social welfare, thus the impact of this is very slow on the

economy and therefore the study recommends more grants, technical cooperation, multilateral and bilateral aid flows, this can only be achieved if the donor countries are assured that the funds will be used prudently as a result of good governance, based on this there is need to strengthen institutions of governance such as the judiciary, office of the ombudsman, Ethics and anticorruption commission among others.

5.4.4 External Government Borrowing from Multilaterals and Economic Growth

The study determined that that increase in GB decreases the GDP significantly. The study therefore recommends that more investment by the government is needed to reduce external borrowing. Further to this the government should ensure that funds sourced from multilaterals are used on development expenditure (projects and programmes) that have economic impact on the country rather than being used on government reccurent expenditure

5.5 Limitations of the Study and Recommendations for Future Research

The researcher encountered a litrature gap on the effect of external financial inflows on economic growth since few research had been done in Kenya employing the Auto Regressive Distributed lag model for co intergration In terms of content, the study focused on four major sources of external financial inflows in Kenya i.e. Foreign Direct Investment (FDI), migrant remittances (MR), foreign aid (FA) and external government borrowing from multilateral sources. Therefore, future studies can consider other variables not studied such as international trade, interest rates on external borrowing and exchange rate .

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APPENDIX 1: DATA COLLECTION WORK SHEET

Year	GDP	Economic Growth Rate	GDP % Economic Growth	FDI	FDI/GDP	MR	MR/GDP	FA	FA/GDP	GB	GB/GDP
1963											
1964											
1965											
1966											
1967											
1968											
1969											
1970											
..											
..											
2017											

APPENDIX 2: DATA ANALYSIS FINDINGS

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
gdp	55	.0495273	.0419329	-.047	.222
fdi	55	.0076621	.006998	.0000472	.0345734
mr	55	.0138068	.0107195	.0028493	.0453516
fa	55	.1563385	.1413383	.0297852	.6359733
gb	55	.0731998	.0593102	.0056664	.2273777

Correlation Matrix

	gdp	fa	mr	fdi	gb
gdp	1.0000				
fa	0.1898	1.0000			
mr	-0.2356	-0.5305	1.0000		
fdi	0.0500	0.0251	0.0891	1.0000	
gb	-0.3651	-0.5531	0.4891	-0.1504	1.0000

	GDP	FA	MR	FDI	GB
GDP	1.0000				
FA	0.1898	1.0000			
	0.1652				
MR	-0.2356	-0.5305*	1.0000		
	0.0834	0.0000			
FDI	0.0500	0.0251	0.0891	1.0000	
	0.7169	0.8556	0.5175		
GB	-0.3651*	-0.5531*	0.4891*	-0.1504	1.0000
	0.0061	0.0000	0.0002	0.2732	

PP Tests

GDP

Phillips-Perron test for unit root — Number of obs = 54; Newey-West lags = 3

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
		Interpolated Dickey-Fuller		
Z(rho)	-47.226	-18.972	-13.332	-10.724
Z(t)	-6.335	-3.574	-2.927	-2.598

MacKinnon approximate p-value for Z(t) = 0.0000

GB

Phillips-Perron test for unit root — Number of obs = 54; Newey-West lags = 3

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
		Interpolated Dickey-Fuller		
Z(rho)	-3.846	-18.972	-13.332	-10.724
Z(t)	-1.515	-3.574	-2.927	-2.598

MacKinnon approximate p-value for Z(t) = 0.5261

FDI

Phillips-Perron test for unit root — Number of obs = 54; Newey-West lags = 3

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
		Interpolated Dickey-Fuller		
Z(rho)	-37.556	-18.972	-13.332	-10.724
Z(t)	-5.286	-3.574	-2.927	-2.598

MacKinnon approximate p-value for Z(t) = 0.0000

FA

Phillips-Perron test for unit root — Number of obs = 54; Newey-West lags = 3

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
		Interpolated Dickey-Fuller		
Z(rho)	-6.923	-18.972	-13.332	-10.724
Z(t)	-4.276	-3.574	-2.927	-2.598

MacKinnon approximate p-value for Z(t) = 0.0005

MR

Phillips-Perron test for unit root — Number of obs = 54; Newey-West lags = 3

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
		Interpolated Dickey-Fuller		
Z(rho)	-13.983	-18.972	-13.332	-10.724
Z(t)	-2.738	-3.574	-2.927	-2.598

MacKinnon approximate p-value for Z(t) = 0.0676

ADF Tests

Dickey-Fuller test for unit root Number of obs = 54

	Test Statistic	Interpolated Dickey-Fuller 1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-6.322	-3.574	-2.927	-2.598

MacKinnon approximate p-value for Z(t) = 0.0000

. dfuller fdi, lags(0)

Dickey-Fuller test for unit root Number of obs = 54

	Test Statistic	Interpolated Dickey-Fuller 1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-5.296	-3.574	-2.927	-2.598

MacKinnon approximate p-value for Z(t) = 0.0000

. dfuller mr, lags(0)

Dickey-Fuller test for unit root Number of obs = 54

	Test Statistic	Interpolated Dickey-Fuller 1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-2.733	-3.574	-2.927	-2.598

MacKinnon approximate p-value for Z(t) = 0.0685

. dfuller fa, lags(0)

Dickey-Fuller test for unit root Number of obs = 54

	Test Statistic	Interpolated Dickey-Fuller 1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-3.512	-3.574	-2.927	-2.598

MacKinnon approximate p-value for Z(t) = 0.0077

Dickey-Fuller test for unit root Number of obs = 54

	Test Statistic	Interpolated Dickey-Fuller 1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-1.349	-3.574	-2.927	-2.598

MacKinnon approximate p-value for Z(t) = 0.6067

. dfuller dgb, lags(0)

Dickey-Fuller test for unit root Number of obs = 53

	Test Statistic	Interpolated Dickey-Fuller 1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-4.760	-3.576	-2.928	-2.599

MacKinnon approximate p-value for Z(t) = 0.0001

. dfuller dmr, lags(0)

Dickey-Fuller test for unit root Number of obs = 53

	Test Statistic	Interpolated Dickey-Fuller 1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-7.212	-3.576	-2.928	-2.599

MacKinnon approximate p-value for Z(t) = 0.0000

PP

```
. pperron Dgdp

Phillips-Perron test for unit root                 Number of obs   =        53
                                                   Newey-West lags =         3

                                 ---------- Interpolated Dickey-Fuller ---------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value            Value
------------------------------------------------------------------------------
 Z(rho)         -63.062           -18.954           -13.324          -10.718
 Z(t)           -13.459            -3.576            -2.928           -2.599
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0000

. pperron Dfdi

Phillips-Perron test for unit root                 Number of obs   =        53
                                                   Newey-West lags =         3

                                 ---------- Interpolated Dickey-Fuller ---------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value            Value
------------------------------------------------------------------------------
 Z(rho)         -59.500           -18.954           -13.324          -10.718
 Z(t)           -12.503            -3.576            -2.928           -2.599
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0000

. pperron Dmr

Phillips-Perron test for unit root                 Number of obs   =        53
                                                   Newey-West lags =         3

                                 ---------- Interpolated Dickey-Fuller ---------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value            Value
------------------------------------------------------------------------------
 Z(rho)         -46.019           -18.954           -13.324          -10.718
 Z(t)            -7.300            -3.576            -2.928           -2.599
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0000
```

```
. pperron Dfa

Phillips-Perron test for unit root                 Number of obs   =        53
                                                   Newey-West lags =         3

                                                    ---------- Interpolated Dickey-Fuller ----------
                 Test                 1% Critical       5% Critical      10% Critical
               Statistic                 Value             Value            Value
------------------------------------------------------------------------------------------
 Z(rho)         -53.710                -18.954           -13.324          -10.718
 Z(t)            -8.318                 -3.576            -2.928           -2.599
------------------------------------------------------------------------------------------

MacKinnon approximate p-value for Z(t) = 0.0000


. pperron Dgb

Phillips-Perron test for unit root                 Number of obs   =        53
                                                   Newey-West lags =         3

                                                    ---------- Interpolated Dickey-Fuller ----------
                 Test                 1% Critical       5% Critical      10% Critical
               Statistic                 Value             Value            Value
------------------------------------------------------------------------------------------
 Z(rho)         -30.545                -18.954           -13.324          -10.718
 Z(t)            -4.671                 -3.576            -2.928           -2.599
------------------------------------------------------------------------------------------

MacKinnon approximate p-value for Z(t) = 0.0001
```

ADF

```
. dfuller Dgdp

Dickey-Fuller test for unit root                   Number of obs   =        53

                                                    ---------- Interpolated Dickey-Fuller ----------
                 Test                 1% Critical       5% Critical      10% Critical
               Statistic                 Value             Value            Value
------------------------------------------------------------------------------------------
 Z(t)           -11.037                 -3.576            -2.928           -2.599
------------------------------------------------------------------------------------------

MacKinnon approximate p-value for Z(t) = 0.0000

. dfuller Dfdi

Dickey-Fuller test for unit root                   Number of obs   =        53

                                                    ---------- Interpolated Dickey-Fuller ----------
                 Test                 1% Critical       5% Critical      10% Critical
               Statistic                 Value             Value            Value
------------------------------------------------------------------------------------------
 Z(t)           -10.357                 -3.576            -2.928           -2.599
------------------------------------------------------------------------------------------

MacKinnon approximate p-value for Z(t) = 0.0000
```

```
. dfuller Dmr

Dickey-Fuller test for unit root                   Number of obs   =        53

                                 ---------- Interpolated Dickey-Fuller ----------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(t)            -7.212           -3.576            -2.928            -2.599
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0000

. dfuller Dfa

Dickey-Fuller test for unit root                   Number of obs   =        53

                                 ---------- Interpolated Dickey-Fuller ----------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(t)            -8.129           -3.576            -2.928            -2.599
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0000


. dfuller Dgb

Dickey-Fuller test for unit root                   Number of obs   =        5

                                 ---------- Interpolated Dickey-Fuller ----------
                 Test         1% Critical       5% Critical      10% Critica
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(t)            -4.760           -3.576            -2.928            -2.5
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0001
```

AIC

Selection-order criteria
Sample: 1966 - 2017 Number of obs = 52

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	651.884				1.1e-17	-24.8802	-24.8082*	-24.6925*
1	677.056	50.343	25	0.002	1.1e-17*	-24.8868*	-24.4552	-23.761
2	698.556	43*	25	0.014	1.3e-17	-24.7521	-23.9609	-22.6883

Endogenous: Dgdp Dfdi Dmr Dfa Dgb
Exogenous: _cons

```
. ardl Dgdp Dfdi Dmr Dfa Dgb, aic

ARDL(4,2,0,4,0) regression

Sample: 1968 - 2017                             Number of obs     =         50
                                                F(  14,     35)   =       5.74
                                                Prob > F          =     0.0000
                                                R-squared         =     0.6966
                                                Adj R-squared     =     0.5753
Log likelihood =   107.5239                     Root MSE          =     0.0337
```

Dgdp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Dgdp						
L1.	-.2328076	.144186	-1.61	0.115	-.5255209	.0599056
L2.	-.5104322	.1294033	-3.94	0.000	-.7731348	-.2477296
L3.	-.2710549	.1312499	-2.07	0.046	-.5375064	-.0046034
L4.	-.3748681	.1087543	-3.45	0.001	-.5956512	-.1540851
Dfdi						
--.	.2030054	.6844334	0.30	0.769	-1.186468	1.592479
L1.	-.5668661	.7107966	-0.80	0.431	-2.00986	.8761277
L2.	.9247505	.696204	1.33	0.193	-.4886187	2.33812
Dmr	.2828309	.6372756	0.44	0.660	-1.010907	1.576569
Dfa						
--.	-.2475055	.2100155	-1.18	0.247	-.6738597	.1788486
L1.	.3776302	.1947662	1.94	0.061	-.0177662	.7730266
L2.	-.4138074	.1270751	-3.26	0.003	-.6717835	-.1558313
L3.	.5003935	.1289697	3.88	0.000	.238571	.762216
L4.	-.2494571	.1402411	-1.78	0.084	-.5341617	.0352475
Dgb	-.248308	.3194627	-0.78	0.442	-.8968517	.4002356
_cons	-.0005544	.0055739	-0.10	0.921	-.01187	.0107613

```
. ardl Dgdp Dfdi Dmr Dfa Dgb, aic ec regstore(ecreg)

ARDL(4,2,0,4,0) regression

Sample: 1968 - 2017                             Number of obs     =         50
                                                R-squared         =     0.8932
                                                Adj R-squared     =     0.8505
Log likelihood =   107.5239                     Root MSE          =     0.0337
```

D.Dgdp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ADJ						
Dgdp						
L1.	-2.389163	.3748504	-6.37	0.000	-3.15015	-1.628176
LR						
Dfdi	.2347641	.6577581	0.36	0.723	-1.100556	1.570084
Dmr	.1183808	.2675412	0.44	0.661	-.4247568	.6615183
Dfa	-.0137062	.1492414	-0.09	0.927	-.3166824	.28927
Dgb	-.103931	.12974	-0.80	0.428	-.3673171	.1594551
SR						
Dgdp						
LD.	1.156355	.295373	3.91	0.000	.5567162	1.755994
L2D.	.645923	.204407	3.16	0.003	.2309548	1.060891
L3D.	.3748681	.1087543	3.45	0.001	.1540851	.5956512
Dfdi						
D1.	-.3578844	1.136683	-0.31	0.755	-2.665473	1.949704
LD.	-.9247505	.696204	-1.33	0.193	-2.33812	.4886187
Dfa						
D1.	-.2147592	.2683407	-0.80	0.429	-.7595197	.3300013
LD.	.162871	.2145187	0.76	0.453	-.2726251	.5983671
L2D.	-.2509364	.1603852	-1.56	0.127	-.5765357	.0746629
L3D.	.2494571	.1402411	1.78	0.084	-.0352475	.5341617
_cons	-.0005544	.0055739	-0.10	0.921	-.01187	.0107613

Pesaran, Shin and Smith, 2001

Pesaran/Shin/Smith (2001) ARDL Bounds Test

H0: no levels relationship F = 11.128
t = -7.263

Critical Values (0.1-0.01), **F-statistic**, Case 3

	[I_0] L_1	[I_1] L_1	[I_0] L_05	[I_1] L_05	[I_0] L_025	[I_1] L_025	[I_0] L_01	[I_1] L_01
k_4	2.45	3.52	2.86	4.01	3.25	4.49	3.74	5.06

accept if F < critical value for I(0) regressors
reject if F > critical value for I(1) regressors

Critical Values (0.1-0.01), **t-statistic**, Case 3

	[I_0] L_1	[I_1] L_1	[I_0] L_05	[I_1] L_05	[I_0] L_025	[I_1] L_025	[I_0] L_01	[I_1] L_01
k_4	-2.57	-3.66	-2.86	-3.99	-3.13	-4.26	-3.43	-4.60

accept if t > critical value for I(0) regressors
reject if t < critical value for I(1) regressors

Regress, ec GDP

```
. ardl Dgdp Dfdi Dmr Dfa Dgb, aic ec regstore(ecreg)

ARDL(4,2,0,4,0) regression

Sample: 1968 - 2017                             Number of obs     =         50
                                                R-squared         =     0.8932
                                                Adj R-squared     =     0.8505
Log likelihood =   107.5239                     Root MSE          =     0.0337
```

D.Dgdp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ADJ						
Dgdp						
L1.	-2.389163	.3748504	-6.37	0.000	-3.15015	-1.628176
LR						
Dfdi	.2347641	.6577581	0.36	0.723	-1.100556	1.570084
Dmr	.1183808	.2675412	0.44	0.661	-.4247568	.6615183
Dfa	-.0137062	.1492414	-0.09	0.927	-.3166824	.28927
Dgb	-.103931	.12974	-0.80	0.428	-.3673171	.1594551
SR						
Dgdp						
LD.	1.156355	.295373	3.91	0.000	.5567162	1.755994
L2D.	.645923	.204407	3.16	0.003	.2309548	1.060891
L3D.	.3748681	.1087543	3.45	0.001	.1540851	.5956512
Dfdi						
D1.	-.3578844	1.136683	-0.31	0.755	-2.665473	1.949704
LD.	-.9247505	.696204	-1.33	0.193	-2.33812	.4886187
Dfa						
D1.	-.2147592	.2683407	-0.80	0.429	-.7595197	.3300013
LD.	.162871	.2145187	0.76	0.453	-.2726251	.5983671
L2D.	-.2509364	.1603852	-1.56	0.127	-.5765357	.0746629
L3D.	.2494571	.1402411	1.78	0.084	-.0352475	.5341617
_cons	-.0005544	.0055739	-0.10	0.921	-.01187	.0107613

```
. estat vif
```

Variable	VIF	1/VIF
Dfdi	1.06	0.942284
Dfa	1.06	0.943054
Dgb	1.02	0.982746
Dmr	1.01	0.986008
Mean VIF	1.04	

```
.
. estat bgodfrey
```

Breusch-Godfrey LM test for autocorrelation

lags(*p*)	chi2	df	Prob > chi2
1	9.407	1	0.0022

H0: no serial correlation

```
.
. estat hettest

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

         chi2(1)      =     4.05
         Prob > chi2  =   0.0441

.
. estat ovtest

Ramsey RESET test using powers of the fitted values of Dgdp
       Ho:  model has no omitted variables
                   F(3, 46) =      0.78
                   Prob > F =      0.5116

.
. swilk Dgdp Dfdi Dmr Dfa Dgb
```

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
Dgdp	54	0.78596	10.698	5.077	0.00000
Dfdi	54	0.83307	8.343	4.545	0.00000
Dmr	54	0.59252	20.365	6.456	0.00000
Dfa	54	0.82459	8.767	4.651	0.00000
Dgb	54	0.80110	9.941	4.920	0.00000

Regress, ec FDI

```
. ardl Dfdi Dgdp Dmr Dfa Dgb, aic ec regstore(ecreg)

ARDL(3,0,0,0,2) regression

Sample: 1968 - 2017                             Number of obs     =         50
                                                R-squared         =     0.7814
                                                Adj R-squared     =     0.7322
Log likelihood =  179.91031                     Root MSE          =     0.0074
```

D.Dfdi	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ADJ						
Dfdi						
L1.	-2.096996	.3436135	-6.10	0.000	-2.791465	-1.402528
LR						
Dgdp	-.0036123	.0100265	-0.36	0.721	-.0238767	.0166521
Dmr	.0196258	.0727012	0.27	0.789	-.1273089	.1665604
Dfa	.0220233	.0174967	1.26	0.215	-.0133389	.0573854
Dgb	.0301508	.0448506	0.67	0.505	-.0604957	.1207973
SR						
Dfdi						
LD.	.6618574	.2569359	2.58	0.014	.1425706	1.181144
L2D.	.3090557	.1489559	2.07	0.044	.0080046	.6101068
Dgb						
D1.	.0258172	.0832529	0.31	0.758	-.1424431	.1940776
LD.	-.126472	.0751449	-1.68	0.100	-.2783455	.0254016
_cons	.0000532	.0010676	0.05	0.961	-.0021045	.0022109

```
. estat vif
```

Variable	VIF	1/VIF
Dfa	1.02	0.981480
Dgdp	1.02	0.981809
Dmr	1.02	0.981863
Dgb	1.02	0.984692
Mean VIF	1.02	

```
.
. estat bgodfrey
```

Breusch-Godfrey LM test for autocorrelation

lags(*p*)	chi2	df	Prob > chi2
1	6.014	1	0.0142

H0: no serial correlation

```
.
. estat hettest

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

         chi2(1)      =     1.90
         Prob > chi2  =   0.1685

.
. estat ovtest

Ramsey RESET test using powers of the fitted values of Dfdi
       Ho:  model has no omitted variables
                  F(3, 46) =      2.00
                  Prob > F =      0.1266

.
. swilk Dfdi Dgdp Dmr Dfa Dgb
```

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
Dfdi	54	0.83307	8.343	4.545	0.00000
Dgdp	54	0.78596	10.698	5.077	0.00000
Dmr	54	0.59252	20.365	6.456	0.00000
Dfa	54	0.82459	8.767	4.651	0.00000
Dgb	54	0.80110	9.941	4.920	0.00000

Regress MR

```
. ardl Dmr Dgdp Dfdi Dfa Dgb, aic ec regstore(ecreg)

ARDL(4,0,4,0,4) regression

Sample: 1968 - 2017                             Number of obs     =         50
                                                R-squared         =     0.8333
                                                Adj R-squared     =     0.7525
Log likelihood =  197.71219                     Root MSE          =     0.0057
```

D.Dmr	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ADJ						
Dmr						
L1.	-2.109133	.2749214	-7.67	0.000	-2.668464	-1.549801
LR						
Dgdp	-.0047955	.0077527	-0.62	0.540	-.0205685	.0109774
Dfdi	.0872044	.216626	0.40	0.690	-.3535246	.5279334
Dfa	.0092594	.0134471	0.69	0.496	-.018099	.0366177
Dgb	.0095258	.047423	0.20	0.842	-.0869571	.1060087
SR						
Dmr						
LD.	.8923397	.2108422	4.23	0.000	.463378	1.321301
L2D.	.8318151	.1590213	5.23	0.000	.5082839	1.155346
L3D.	.5481115	.1254211	4.37	0.000	.2929403	.8032826
Dfdi						
D1.	-.2169466	.4021541	-0.54	0.593	-1.035135	.6012421
LD.	-.1426077	.3176432	-0.45	0.656	-.7888575	.5036422
L2D.	-.1719117	.2263733	-0.76	0.453	-.6324716	.2886481
L3D.	-.2601431	.1251977	-2.08	0.046	-.5148598	-.0054263
Dgb						
D1.	.0556924	.0907118	0.61	0.543	-.1288622	.2402471
LD.	.0205509	.0797996	0.26	0.798	-.1418027	.1829044
L2D.	-.1137487	.0699486	-1.63	0.113	-.2560603	.0285628
L3D.	-.1309781	.0675667	-1.94	0.061	-.2684435	.0064873
_cons	.000853	.0008336	1.02	0.314	-.0008428	.0025489

```
. estat vif
```

Variable	VIF	1/VIF
Dfa	1.06	0.940032
Dfdi	1.05	0.947943
Dgb	1.02	0.985093
Dgdp	1.01	0.991875
Mean VIF	1.04	

```
.
. estat bgodfrey
```

Breusch-Godfrey LM test for autocorrelation

lags(*p*)	chi2	df	Prob > chi2
1	0.015	1	0.9025

H0: no serial correlation

```
.
. estat hettest

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

         chi2(1)      =     5.22
         Prob > chi2  =   0.0224

.
. estat ovtest

Ramsey RESET test using powers of the fitted values of Dmr
       Ho:  model has no omitted variables
                  F(3, 46) =      0.58
                  Prob > F =      0.6320

.
. swilk Dmr Dgdp Dfdi Dfa Dgb
```

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
Dmr	54	0.59252	20.365	6.456	0.00000
Dgdp	54	0.78596	10.698	5.077	0.00000
Dfdi	54	0.83307	8.343	4.545	0.00000
Dfa	54	0.82459	8.767	4.651	0.00000
Dgb	54	0.80110	9.941	4.920	0.00000

Regress, FA

```
. ardl Dfa Dgdp Dfdi Dmr Dgb, aic ec regstore(ecreg)

ARDL(3,1,2,0,0) regression

Sample: 1968 - 2017                             Number of obs     =         50
                                                R-squared         =     0.8556
                                                Adj R-squared     =     0.8186
Log likelihood =  119.04756                     Root MSE          =     0.0253
```

D.Dfa	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ADJ						
Dfa						
L1.	-1.116782	.1966605	-5.68	0.000	-1.514565	-.7189985
LR						
Dgdp	-.2699945	.1388499	-1.94	0.059	-.550845	.010856
Dfdi	1.208094	1.045923	1.16	0.255	-.9074852	3.323673
Dmr	.1946822	.4227963	0.46	0.648	-.660504	1.049868
Dgb	.3156226	.1948022	1.62	0.113	-.0784021	.7096473
SR						
Dfa						
LD.	.0392206	.1139129	0.34	0.732	-.1911901	.2696312
L2D.	-.2398485	.098227	-2.44	0.019	-.4385313	-.0411657
Dgdp						
D1.	.1171658	.0761271	1.54	0.132	-.0368159	.2711474
Dfdi						
D1.	-.3132532	.8389507	-0.37	0.711	-2.010191	1.383685
LD.	-.77159	.4984631	-1.55	0.130	-1.779827	.2366467
_cons	-.006354	.0039999	-1.59	0.120	-.0144446	.0017367

Variable	VIF	1/VIF
Dmr	1.02	0.975652
Dfdi	1.02	0.983479
Dgdp	1.02	0.984612
Dgb	1.01	0.990415
Mean VIF	1.02	

```
.
. estat bgodfrey
```

Breusch-Godfrey LM test for autocorrelation

lags(*p*)	chi2	df	Prob > chi2
1	0.603	1	0.4374

H0: no serial correlation

```
.
. estat hettest

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

         chi2(1)      =     2.22
         Prob > chi2  =   0.1366

.
. estat ovtest

Ramsey RESET test using powers of the fitted values of Dfa
       Ho:  model has no omitted variables
                  F(3, 46) =      0.14
                  Prob > F =      0.9333

.
. swilk Dfa Dgdp Dfdi Dmr Dgb
```

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
Dfa	54	0.82459	8.767	4.651	0.00000
Dgdp	54	0.78596	10.698	5.077	0.00000
Dfdi	54	0.83307	8.343	4.545	0.00000
Dmr	54	0.59252	20.365	6.456	0.00000
Dgb	54	0.80110	9.941	4.920	0.00000

Regress GB

```
. ardl Dgb Dgdp Dfdi Dmr Dfa, aic ec regstore(ecreg)

ARDL(2,2,2,0,0) regression

Sample: 1968 - 2017                             Number of obs     =         50
                                                R-squared         =     0.5298
                                                Adj R-squared     =     0.4093
Log likelihood =  144.88384                     Root MSE          =     0.0151
```

D.Dgb	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ADJ						
Dgb						
L1.	-.6446027	.1621642	-3.97	0.000	-.9726108	-.3165946
LR						
Dgdp	-.2686243	.1988166	-1.35	0.184	-.6707689	.1335202
Dfdi	.4884231	1.047613	0.47	0.644	-1.630574	2.60742
Dmr	-.0136909	.4628375	-0.03	0.977	-.9498682	.9224864
Dfa	.2609679	.1454823	1.79	0.081	-.0332978	.5552335
SR						
Dgb						
LD.	.2492309	.1530903	1.63	0.112	-.0604236	.5588853
Dgdp						
D1.	.1232642	.084006	1.47	0.150	-.0466541	.2931825
LD.	.0956977	.0464126	2.06	0.046	.0018194	.1895759
Dfdi						
D1.	.0758165	.5045988	0.15	0.881	-.944831	1.096464
LD.	.3988808	.2872664	1.39	0.173	-.1821703	.9799318
_cons	.0015452	.0021811	0.71	0.483	-.0028666	.005957

```
. estat vif
```

Variable	VIF	1/VIF
Dfdi	1.06	0.943635
Dfa	1.06	0.947190
Dmr	1.02	0.977799
Dgdp	1.02	0.981274
Mean VIF	1.04	

```
.
. estat bgodfrey

Breusch-Godfrey LM test for autocorrelation
```

lags(*p*)	chi2	df	Prob > chi2
1	9.279	1	0.0023

```
                         H0: no serial correlation

.
. estat hettest

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

         chi2(1)      =     5.25
         Prob > chi2  =   0.0220

.
. estat ovtest

Ramsey RESET test using powers of the fitted values of Dgb
       Ho:  model has no omitted variables
                    F(3, 46) =      6.60
                    Prob > F =      0.0008

.
. swilk Dgb Dgdp Dfdi Dmr Dfa

                  Shapiro-Wilk W test for normal data
```

Variable	Obs	W	V	z	Prob>z
Dgb	54	0.80110	9.941	4.920	0.00000
Dgdp	54	0.78596	10.698	5.077	0.00000
Dfdi	54	0.83307	8.343	4.545	0.00000
Dmr	54	0.59252	20.365	6.456	0.00000
Dfa	54	0.82459	8.767	4.651	0.00000

Johansen

```
. vecrank Dgdp Dfdi Dmr Dfa Dgb, trend(constant) lags(1)

                    Johansen tests for cointegration
Trend: constant                                      Number of obs =      53
Sample:  1965 - 2017                                       Lags =       1
```

maximum rank	parms	LL	eigenvalue	trace statistic	5% critical value
0	5	568.07896	.	246.5989	68.52
1	14	605.08419	0.75252	172.5884	47.21
2	21	639.24924	0.72452	104.2583	29.68
3	26	662.37761	0.58221	58.0016	15.41
4	29	681.95201	0.52224	18.8528	3.76
5	30	691.3784	0.29933		

.

maximum rank	parms	LL	eigenvalue	max statistic	5% critical value
0	5	568.07896	.	74.0105	33.46
1	14	605.08419	0.75252	68.3301	27.07
2	21	639.24924	0.72452	46.2567	20.97
3	26	662.37761	0.58221	39.1488	14.07
4	29	681.95201	0.52224	18.8528	3.76
5	30	691.3784	0.29933		

Vector error correction model

```
. vec Dgdp Dfdi Dmr Dfa Dgb, trend(constant)

Vector error-correction model

Sample:  1966 - 2017                            Number of obs     =         52
                                                AIC               =  -22.96027
Log likelihood =  635.9671                      HQIC              =  -22.39923
Det(Sigma_ml)  =  1.64e-17                      SBIC              =  -21.49684

Equation           Parms      RMSE     R-sq      chi2     P>chi2
------------------------------------------------------------------
D_Dgdp                 7     .050022   0.7520   136.4528   0.0000
D_Dfdi                 7     .010916   0.4658   39.23973   0.0000
D_Dmr                  7     .010664   0.2075   11.78081   0.1080
D_Dfa                  7     .065161   0.3430   23.49473   0.0014
D_Dgb                  7     .019361   0.1094   5.529394   0.5956
------------------------------------------------------------------
```

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
D_Dgdp						
_ce1						
L1.	-1.590939	.2328959	-6.83	0.000	-2.047407	-1.134472
Dgdp						
LD.	.2681091	.1433407	1.87	0.061	-.0128336	.5490518
Dfdi						
LD.	-1.557976	.5321887	-2.93	0.003	-2.601047	-.5149056
Dmr						
LD.	.2398953	.6495639	0.37	0.712	-1.033227	1.513017
Dfa						
LD.	.5089391	.0945242	5.38	0.000	.323675	.6942032
Dgb						
LD.	-.2608951	.3767368	-0.69	0.489	-.9992855	.4774954
_cons	.0001012	.0069379	0.01	0.988	-.0134969	.0136993

SWILK

```
. swilk Dgdp Dfdi Dmr Dfa Dgb

                    Shapiro-Wilk W test for normal data

    Variable |        Obs       W           V         z       Prob>z
-------------+-------------------------------------------------------
        Dgdp |         54    0.78596     10.698     5.077    0.00000
        Dfdi |         54    0.83307      8.343     4.545    0.00000
         Dmr |         54    0.59252     20.365     6.456    0.00000
         Dfa |         54    0.82459      8.767     4.651    0.00000
         Dgb |         54    0.80110      9.941     4.920    0.00000
```