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Income Repatriation and Its Relationship to Foreign Direct Investment and Economic Growth in Kenya (1970 -2017)

Simon Kariuki Kamau
Department of Applied Economics, School of Economics, Kenyatta University
Corresponding Author: Stephen Njaramba, PhD.

Abstract: *Developing countries have invested heavily in pursing policies and strategies to attract foreign direct investments to augment the existing capital stock. These efforts have seen a substantial increase in the flow of foreign direct investments to developing countries. For the last two decades foreign direct investments inflows in Kenya has risen substantially but the effect of the rising inflows on economic growth has not been felt. The growth in foreign direct investments inflows has been coupled with an upsurge in income repatriation, as foreign investors repatriate earnings and it is probable that the whopping repatriation has eroded the benefits associated to such inflows. This study sort to establish the relationship between income repatriation, foreign direct investments and economic growth using time series data from 1970 to 2017. The data was obtained from World Bank United Nations Conference on Trade and Development, and Central Bank of Kenya. The study used vector autoregressive modelling to show the direction of causality between foreign direct investment, income repatriation and economic growth and to analyze the impulse response. After establishing the direction of causality, autoregressive distributed lag modelling was applied to show the short run and the long run effect of income repatriation to foreign direct investment and income repatriation to economic growth respectively. Private domestic investments, trade openness, human capital, real exchange rate, inflation and real interest rate were used as the extraneous variables. From the results of the study, Income repatriation was found to have a positive and significant effect on foreign direct investments in the short run and in the long run but had a negative significant effect on economic growth in the short run and in the long run. From the findings of the study, the income repatriation has an undesirable effect to the economy and the government should consider pursuing policies that not only attracts foreign investment into the country but also policies that require the foreigners to reinvest a certain proportion of their earnings to the host country. Equally, it is evident that private domestic investment has a positive and significant effect on foreign direct investment and economic growth in the short run and in the long run and thus, the government should also consider policies geared to promoting and encouraging private domestic investment more than the foreign direct investments as growth in private domestic investment has a positive cascading effect on foreign direct investment and economic growth in the short run and in the long run.*

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I. Introduction

1.1 Background of the Study

Achieving high economic growth has been the central policy objective of every country in the world motivated by the need to address socio-economic problems such as high poverty level, low saving rate, deficits in balance of payment and widening foreign exchange gaps (Abala, 2014). This has seen many counties in the world pursue policies and strategies to enhance economic growth among them to promote Foreign Direct Investment (FDI) inflows to supplement the existing capital stock (Wanjiku, 2014).

FDI inflows have increased substantially over the last twenty years and have become an important source of external financing to many developing countries however this increase as occurred in tandem with increased income repatriation as foreign investors send back home their earnings (Abala 2014). When a firm invests in the host country and reinvests the profits, the effect of such investments creates a multiplier effect, which in returns spurs the economic growth (Blades & Lequiller, 2014). Nonetheless if the profits are repatriated and not reinvested, the repatriated income drains the economy applying pressure on the balance of payment and creates a negative investment multiplier (Grimes, 2000). The objective of every investor is to make profits and repatriate those profits back to their home country. On the other hand the host country motivation is the need to accumulate foreign capital for the balance of payment as well as the need to control the outflows of capital from the economy in fear of decapitalizing the economy (Tufa, 2018).

According to Singh (2015) income repatriation is generally defined as the ability to return foreign-earned profits or financial assets back to the investor's home country. Income earned by foreign investors through investments made abroad can either be reinvested or repatriated back to their home country however, the decision on reinvestment or repatriation depends on a number of domestic and foreign conditions (Lundan, 2006).

1.1.1 Economic Growth, FDI and Income Repatriation in Sub-Saharan Africa.

In Sub-Saharan Africa, economic and social situation has remained fragile and vulnerable to domestic and external shocks (Ulku, 2004). Investment remains subdued, limiting efforts to diversify economic structures to boost economic growth in the region (Nkurunziza and Bates, 2004). Countries in Sub-Saharan African continue to face major challenges which includes; acceleration of economic growth, reduction of poverty and economic integration into the world's economy. The Economic growth rates in Sub-Sahara, are still low to affect the high poverty level and enable the countries catch up with other developing nations (Nkurunziza and Bates, 2004). Figure 1.1 shows the Sub-Sahara economic growth from the year 1963 to 2017.

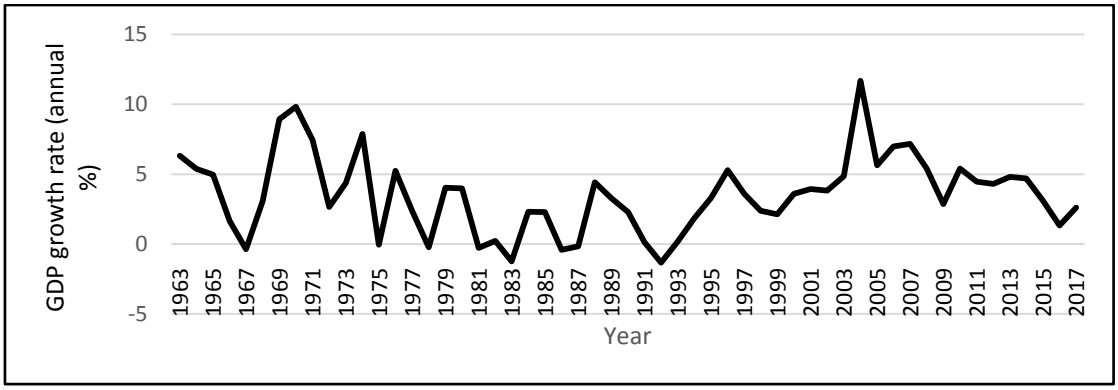

Figure 1.1 Sub-Sahara GDP growth rate for the period 1963 and 2017

Source: Own Calculations from World Bank data

Since 1960, the economic growth of Sub Saharan Africa on average has significantly lagged behind that of other regions of the world. Nevertheless, the performance has rather been sporadic, with countries in Africa growing fairly stronger until around the late 1970s as depicted by figure 1.1 above, when the GDP growth started to drop significantly. However, most African countries have showed progressively a solid growth since the mid-1990s. In 2007, for instance, the region's GDP growth averaged 5.8 percent, a rate that was comparable to those in other regions of the world (World Bank, 2008).

Sub-Sahara Africa has recorded substantially a high FDI inflow for the last three decades. According to Kumari (2014), FDI is regarded as a catalyst for economic growth due to its potential to fuel domestic investments of the host country through diffusion of technology and enhancement of competition in local market which reduces saving and investment gaps. Figure 1.2 below shows the trends on FDI in the 1970 and 2014.

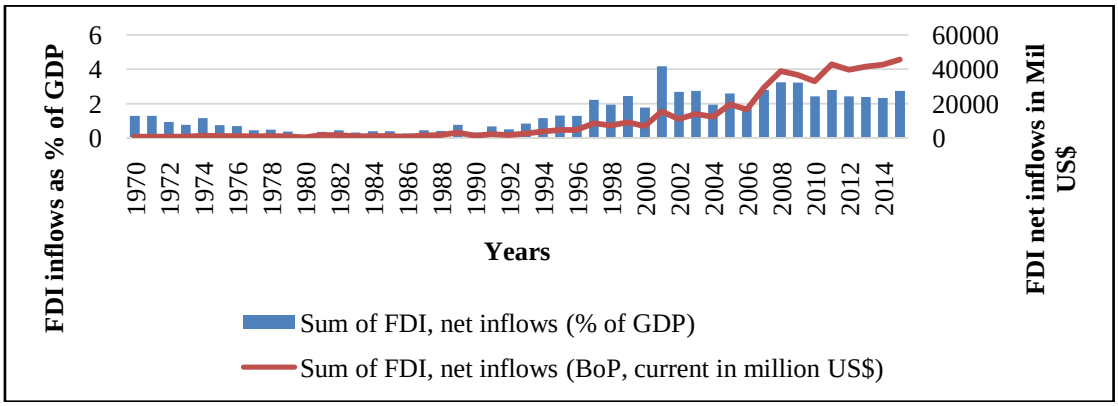

Figure 1.2 FDI inflows to Sub-Saharan Africa (1970 – 2014)

Source: Own Calculation from World Bank data.

The average annual FDI inflows to Sub-Sahara region, reached US$1.31 billion in the 1980s, but continued to experience an upsurge to US$4.78 billion in the 1990s and US$27.47 billion in 2000-2010. The Inflows peaked in 2008, to exceed US$50 billion, but declined in 2009 to reach US$44.4 billion in 2009 and

US$39.7 billion in 2010 following the impact of global economic crisis. The average FDI influx to Sub-Saharan Africa as ratios of the region's GDP rose from 0.50 per cent in the 1980s to 1.46 per cent in the 1990s and 3.94 per cent in 2000-2010 (Michaowski, 2016).

Nonetheless, the income repatriated by foreign investors has gradually increased as foreigners repatriate their earning back home. According to Bisat & Schiffrin (2004), if FDI becomes too extensive, repatriated income can put pressure on the balance of payments in the long run. As foreign owned companies become established and profitable, they begin to repatriate their earnings to their home country, which decapitalizes the country and if the base of the foreign firms is large enough, this can lead to serious capital drain especially if not offset by additional FDI. The impact of income repatriation is highly felt during the economic downturn where foreign owned companies reduces FDI flow and at the same time accelerates income repatriation (Fowler & Watkins, 2002).

According to Singh (2015) there are five common methods of income repatriation namely; financing structure, parallel loans, rein-voicing centres, royalty payments, and transfer pricing. Under the financing structure, the subsidiary companies can repatriate more income inform of profits if the operations are financed more on loans than equity since interest payments are tax deductible while dividends are not tax deductible. On the Parallel loans, firms in different countries advance parallel loans to each other's subsidiaries in the context where profit repatriation is not allowed such that repatriation of income occurs when the loans are repaid through local currency. Rein-voicing centres are centres that acts as intermediary gateways between two firms in a third country that has low capital controls. In this arrangement, the subsidiaries can repatriate income inform of profits by paying the parent company through the centres. Royalty payments is the most effective method of repatriating income as they are not considered as profit transfers hence not subjected to the restrictions regulating repatriations. The last method of income repatriation is transfer pricing. In this modality, the pricing of goods from parent to the subsidiary company transfer the profits from one country to another. Technically, high transfer price on goods from the parent company will move the profits from the subsidiary to the parent company (Singh, 2015)

Regionally, most of countries have experienced a whopping growth in income repatriation over the last two decades as foreigners' increases foreign direct investments and simultaneously repatriate back home their profits (Kumari, 2014). While such inflows can fuel domestic investments in the economy, the effect of the outflows may have a detrimental effect on the balance of payment and economic growth if not offset by additional FDI (Bisat & Schiffrin, 2004). Figure 1.3 below shows the trend in income repatriation of five selected countries in Africa namely; Morocco, Zambia, Rwanda, Madagascar, Kenya and Ethiopia.

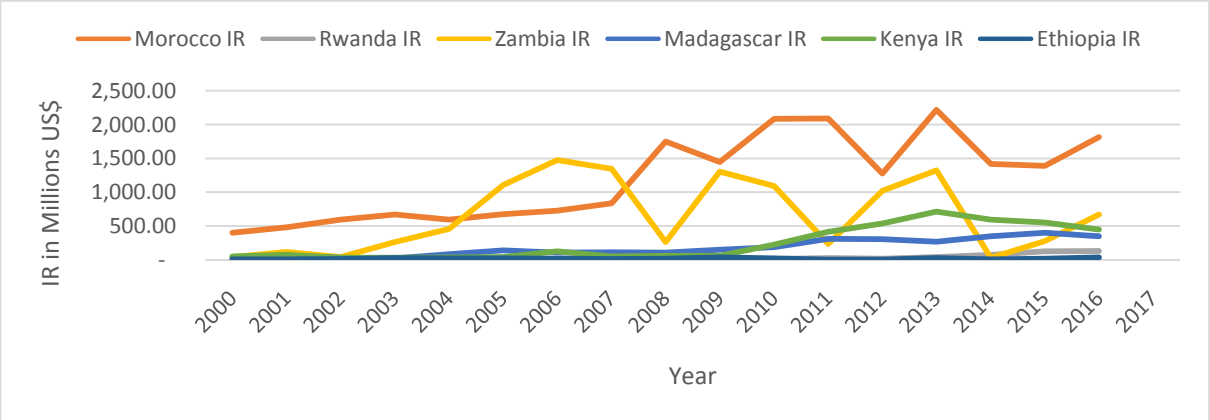

Figure 1.3 Income Repatriation of 5 selected countries 2000 to 2017
Source: *Own calculation from World Bank data*

Morocco exhibit the highest income repatriation followed by Zambia, Kenya, Madagascar Rwanda and Ethiopia. The income repatriation in Rwanda and Ethiopia are relatively low compared to the other countries possibly because the two counties regulate the volume of income that can be repatriated by the foreigners. It would also imply that the level of reinvestments in the two countries is high compared to the other countries. Income repatriated by foreign firms may depend on the existing laws that regulates amount sent out of the country by the foreigners as well as the environment that would allow and encourage the foreigners to reinvest the earning in the host country.

1.1.2 Economic Growth, Foreign Direct Investment and Income Repatriation in Kenya.

Achieving high economic growth and building a prosperous nations has been a central policy objective for Kenya since independence (Republic of Kenya, 2003). However, the Kenyan economic performance has been characterized by slowed economic growth and periodic fluctuations. Figure 1.4 depicts the trend on

Kenyan economic growth rate since independence

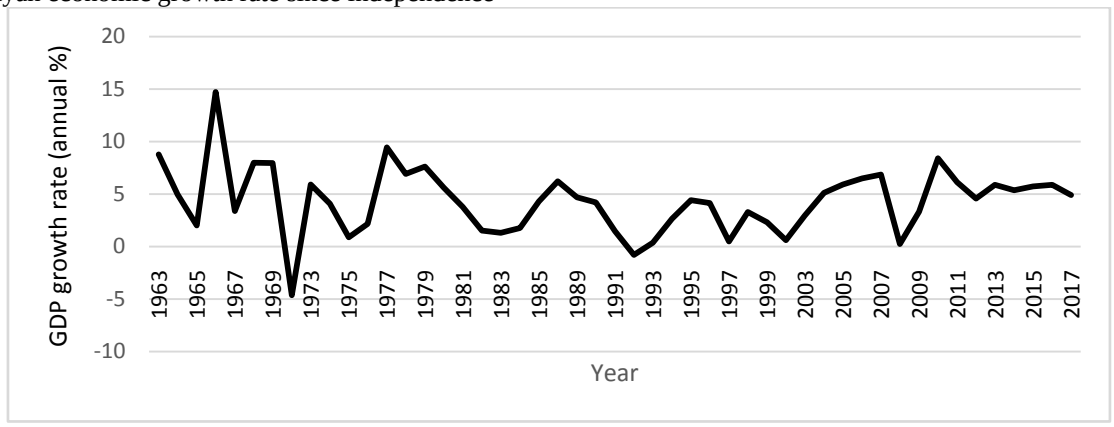

Figure 1.4 Kenya GDP growth from 1963 to 2017

Source: *Own calculation from World Bank data*

Kenyan Economic growth performance can be broken down into 3 phases i.e. Boom, stagnation and sluggish recovery. The period 1963- 1980, was a post impendence boom characterized with high economic growth supported by increased domestic investments on agriculture as shown by figure 1.4. This was followed by two decades of income per capita stagnation and slowed economic growth in the period 1980 – 2004. The period 2004 – 2017 was characterized by slowed recovery until 2010 after which the trend plateaued. Nevertheless, Kenya has made significant efforts to revive the economic growth through pursuing policies and strategies geared to attracting foreign investments in order to augment the existing capital stock and fuel economic growth. Most recent policies and strategies includes the Economic Recovery Strategy (ERS) for Wealth and Employment Creation anchored on revitalization of economic growth with major focus on infrastructure development; improvement of citizens' welfare; and accountability in management of resources as the main pillars underscored on the need to create a conducive investment and business environment in Kenya (Republic of Kenya 2003). The Investment Plan for ERS (Republic of Kenya 2003) estimated that investment growth would drive the growth ambitions of the country, with projected external investment requirements amounting to at least US$2.2 billion and US$1.1 billion in the public and private sectors respectively over the period 2003-2007..The strategy recorded some noticeable improvements such as raising the growth prospects from 2.9 per cent in 2003 to around 7.0 per cent in 2007 as well as boosting the investors' confidence. However, this growth was followed by a fluctuation in the following years with growth recording as low as 0.20 per cent (Collier (2010)

Building on the implementation of ERS, Kenya promulgated the Kenya's Vision 2030 blue print, a long-term development strategy that was aimed to advance growth trajectory of the country. The blue print is anchored on economic, social and political pillar, and aims to make Kenya a globally competitive, and industrializing middle-income country by 2030. Through Vision 2030, Kenya aimed to achieve a GDP growth rate of 10% per annum from 2012. To achieve this target, the country aim to address the key constraints, notably, a low savings to GDP ratio, through drawing more remittances from Kenyans in abroad, as well as increased foreign investment by easing the cost of doing business within the country (Republic of Kenya 2013).

Access to inbound FDI plays an important role in supplementing domestic savings, which are insufficient in developing countries. Countries with high investment to GDP ratio often experience a high economic growth compared to those with low investments (World Bank, 1989). Motivated by the need to attract foreign investments from abroad, Kenya has put a lot of incentives as evidenced by policies and legislative enacted to harness foreign investments which includes; Export Processing Zone (EPZ) Act in 1990 (Republic of Kenya 1991), Investment promotion Act in 2004 (Republic of Kenya, 2004) and Special Economic Zone Act in 2015 (Republic of Kenya 2015). According to UNCTAD (2018) FDI in Kenya has been growing steadily and recorded US$ 672 million in 2017, which was a 70% increase year on year and the total FDI stock stood at US$ 11.9 billion (15.9% of GDP).

Despite the increased flows in FDI, the Kenyan economic growth trajectory has remained lower than expected and the role of FDI in augmenting low domestic savings to positively influence economic growth is not felt. Whereas Kumari (2014) holds the view that FDI is a catalyst for economic growth and an important vehicle for transfer of technology from developed to developing countries, the paradox between FDI influxes and slowed economic growth could be attributed to the rising income repatriation lowing the potential of FDI to affect the economic growth.

According to UNDP (2011), profits repatriated from FDI investments grew notably between 1995 and 2008 in developing countries. Kenya through Foreign Investment Protection Act (FIPA) guarantees capital

repatriation and remittance of dividends and interest to foreign investors in country after taxation (Republic of Kenya, 2016). Repatriated income in developing countries Kenya inclusive increased by 747 per cent from US$ 33 billion in 1995 to US$276 billion in 2008. It is clear that profits repatriated from developing countries are equal in some instances or higher in other periods than the FDI inflows (Bhinda & Martin, 2009). The table 1.1 indicates the ratios of FDI and income repatriation to GNI in Kenya between 2008 and 2017 and their trends.

Table 1.1 FDI and income repatriation as a percentage of GNI in Kenya

Years	FDI, net inflows (BoP, current US$) in Millions	GDP (current US$) in Millions	Income Repatriated (US $) in millions	FDI, net inflows (% of GNI)	Income repatriated (% of FDI)	Income repatriated (% of GNI)
2008	95.59	35,863.49	221.42	0.27%	232%	0.62%
2009	116.26	36,976.86	212.35	0.31%	183%	0.57%
2010	178.06	39,852.46	291.86	0.45%	164%	0.73%
2011	1,450.47	41,961.91	404.2	3.46%	28%	0.96%
2012	1,380.17	50,187.34	662.17	2.75%	48%	1.32%
2013	1,118.83	54,496.76	933.36	2.05%	83%	1.71%
2014	820.94	60,579.81	1,364.63	1.36%	166%	2.25%
2015	619.72	63,323.68	1,176.01	0.98%	190%	1.86%
2016	393.36	70,191.35	1,117.26	0.56%	284%	1.59%
2017	671.49	78,442.76	1,218.81	0.86%	182%	1.55%

Source: Own calculation from World Banks and IMF data

As noted from table 1.1 above, the volume of income repatriated as a percentage of GDP superseded the volume of FDI inflows recorded between 2008 to 2010 and 2014 to 2017. In 2008 and 2016, for instance, over 2 US$ were repatriated to foreign countries for every 1 US$ invested in inform of FDI Income repatriated to FDI inflows remain considerably high lowering the benefits that would be associated to inbound FDI inflows. This therefore leaves the question on the relationship of income repatriation with FDI and GDP and their long run effect to economic growth in Kenya.

1.2 Statement of the problem.

TheKenyan Governmenthas placed ahighpremiumontheinfluenceofinwardsFDI on economicgrowthasshowninseveraldeliberateinvolvementsintroducedtoharnessFDIinflowsinto the country, with an aim to achieve sustainable economic growth. According to UNCTAD (2018) FDI in Kenya has been growing steadily and recorded US$ 672 million in 2017, which was a 70% increase year on year. The total FDI stock stood at US$ 11.9 billion (15.9% of GDP) in 2017. Nonetheless, available data shows that income repatriation by foreign firms has continually grown year by year making the gains of FDI inflows as a means to supplement domestic saving and increase economic growth be in question. Income repatriation decapitalizes the country and can lead to serious crunch if not offset by additional FDI (Bisat & Schiffrin, 2004). Income repatriation has undesirable outcome to the current account as it worsens the balance of payment.

Existing studies (Nyamwange 2009, Musau 2009, Ocharo *et. al.* 2014)) have concentrated on the nexus between FDI and Economic growth in Kenya. Their studies concluded presence of a positive association between FDI and Economic growth. However, the studies did not look at the relationship between Income Repatriation and FDI, and Income repatriation on Economic growth in Kenya.

Consecutive governments in Kenya have laid emphasis on the need to improve investment environment (in some instances offering concessions) in bid to attract FDI however, the question is whether this growth in FDI has a positive effect to the economy in short-run and in long-run. Is it possible that the gains of FDI are immediately negated by the income repatriation? Given the level of significance accorded to FDI by the Kenya government, it is necessary to examine the link between Income Repatriation, FDI and Economic growth in Kenya.

1.3 Objectives of the Study

The general objective of thestudyis todetermine the relationship between Income Repatriation, FDI and Economic growth in Kenya. The specific objective are:

1.3.1 To establish the relationship between income repatriation and FDI in Kenya given increasing income repatriation.

1.3.2 To establish the relationship between income repatriation and Economic growth in Kenya

1.4 Research Questions

1.4.1 What is the relationship between income repatriation and FDI in Kenya given increasing income repatriation?

1.4.2 What is the relationship between Income repatriation and Economic growth in Kenya?

1.5 Significance of the study

FDI and the issue of Economic growth affect several stakeholders including governments, the MNCs and scholars. The current study aims at unearthing and providing some empirical evidence regarding income repatriation and its link to FDI and economic growth in Kenya. As such, the findings of this study are important to a number of stakeholders including the government of Kenya, foreign investors, MNCs and future researchers. The study has the potential to inform current policy and facilitate further research.

1.6 Scope of the Study

The study will take into consideration the period between 1970 and 2017, as this is the period in which Kenya implemented various policies and programs aimed at promoting FDI inflows, and will only focus on Kenya as a county.

II. Review of related Literature

2.1 Theoretical Literature Review

This section focuses on the theories that explain the relationship between the foreign direct investments, income repatriation

2.2 Neoclassical growth theory

The Solow growth model (Solow, 1956) is an economic model of long run economic growth set within the framework of neoclassical economics. The model assumes that the production function is increasing in inputs but exhibits constant return to scale, strict essentiality of all the inputs and diminishing marginal product. The model seeks to explain how the long run economic growth can be achieved through the use of the three factors of production namely; labor, Capital and technology. According to the model, the equilibrium state can be achieved by varying the amount of inputs that enters the production function. The theory underscores the role of technology on economic growth and argues that growth will not be achieved if there is no technological advancement. The views of the advocates of capital account liberalization as a means of realizing high economic growth can be demonstrated using this neoclassical paradigm. According to the model, international capital is beneficial to the recipient countries in three ways. First, it widens investments and output since the introduced capital can be used to accelerate the catching-up process by way of higher investment. Second, it advances the welfare of citizens of the receiving countries by reinforcing external shocks to income flows which aids the process of consumption smoothing. Third, international capital is a means of risk diversification as it allows the economy to hedge against peculiar income shocks by saving part of their national savings abroad. However, the theory does not document the effect of income repatriations from the FDI

2.3 Endogenous Growth Theory

Romer (1986) follows the economics of learning by doing attributed to Arrow (1962), where experience and increasing productivity are highly associated. The main intuition of the model is that technological progress is the driving force behind economic growth and the aim is to explain the rate of growth that results from technological progress and invention. As opposed to Solow's model where technological progress grows exogenously, Romer assumes that technological progress grows endogenously and includes the mechanism within his growth model. In this model, ideas increases the stock of knowledge *A* and consequently raise the productivity of both capital and labour. The model adopts a similar production function to the one advanced by Solow, but assumes *A* to be an endogenous factor. The output is a function of capital, labour, technological change and human capital. According to the model, the population grows constantly at a rate *n*, and the economy grows only if the technology is growing. The higher the population growth, the higher the technological progress and therefore the higher the long run economic growth. While the theory focuses on how Capital, labour technology and human capital together advances output, it fails to bring out the effect of income repatriation on FDI as a component of capital

Rebelo (1987) developed a linear production function where output is a linear function of capital. The production function is expressed as follows;

$$Y=AK \qquad 2.1$$

Where K is a composite representation of human and physical capital.

The AK model does not exhibit diminishing returns to capital and implies a sustained growth of per capita income without any tendency of economy approaching the steady state. A rise in saving rate has a proportional effect to the growth of per capita income on a permanent basis. Rebelo established that technology does not need to exhibit linearity with capital for sustained growth, but sufficiency may be attained by relaxing the Inada conditions at infinity i.e.$Lim_{k\to\infty} f'(k) = b$and b - σ > discount rate. The production function that satisfies this condition would be expressed in the form;

$$Y = aK^{\alpha}L^{1-\alpha} + bK \qquad 2.2$$

AK model has been used by this study as it seeks to show how a combination of capital and labor would cause growth and one source of capital if foreign direct investments. The model however did not shed light on the effect of income repatriation on growth.

2.4 Dunning's Electric Theory

Dunning (1988) offers an outline of three arrays of benefits to scrutinize why MNC's would invest overseas, and where would invest in the overseas. This is the renowned location, ownership, and internalization (OLI) model (or eclectic paradigm). In this framework, investment could be; natural (resource) pursuing, market seeking, productivity seeking or tactical asset seeking.

The ownership benefits denotes to firm-specific features sometimes named competitive or monopolistic benefits which must be adequate to reward for the costs of planning and operating a foreign value-adding process, along with those faced by local producers. Such features include things like patents, market access, brand, research and trademarks, development, and superior technology. These may be scarce in the host country. When foreign companies use such features in manipulating host country's prospects, they use hostile selection in an imperfect market condition in nurturing their activities. As a result, because of information irregularity and restraint of some features controlled by host country's businesses, competition with MNCs is hard. The ownership detailed advantages, being greater, to home country's companies, may make foreign investors to crowd out domestic ventures (Miberg, 1996).

The Locational advantage element of the eclectic paradigm is apprehensive of the "where" of production. These comprise host country-exact characteristics that can sway MNCs to locate an economic activity in that nation. They include economic aspects such competitive communications and transportation costs, investment enticements, availability of moderately cheap factors of production, policy matters such tariff hurdles, tax systems, access to foreign and local markets, among other aspects (Buckley & Casson, 1998).

The third feature is the internalization benefit which explains 'why' a Foreign Direct Investor would want to exploit its resources abroad by acquiring or opening a subsidiary as opposed to just licensing or selling the rights to exploit those resources to a foreign company. Yarbrough & Yarbrough (2002) report that though this model has been evaluated for only citing the circumstances essential for FDI without enlightening on its phenomenon, it has extensively contributed to international production theory.

2.5 Institutional theory

Institutional theory emphasizes on the role of the institutions in attracting FDI. The theory focus on foreign direct investment through a complex and uncertain environment in which they are located. From this perspective, the decision to locate foreign investments depends greatly on the institutional forces that shape the environment in which the foreign company will be established, such as regulations and the motivations offered to foreign investors (Francis et al , 2009). In this context, the strategies adopted by companies and their performance on international markets are largely determined by institutions, that is, by the "rules of the game" (Peng, 2009). Foreign investment can hence be viewed as a 'game' in which the players, that is, the multinational firm and the government of the host country compete between governments to attract foreign direct investments (Faeth, 2009).

2.6 Theory of Repatriation and Structural Transformation

This theory attributes both economic and social consequences to structural transformation as a result of income repatriation. Glytsos (2002) associates shortage, economic well-being and resource distribution with outcome on intake patterns and reserves to expansion or growth through modifications in trade and investments. However, in countries with big number of expatriates, repatriation may have an insightful effect on varying the structure of the economies, improving living standards and creating favourable condition for local development such as improved sectoral productivity in case of developing economies. Despite the negative relationship to development as postulated through inflation created by induced rising demand and unresponsive supply (Looney, 1990), it is evident that wages may rise by increasing leisure on recipients through remittances hence reducing labour supply (Katseli & Glytsos., 1989).

Income repatriation to the mainstream sub sectors contributes to main structural change and development. According to Papademetriou and Martin (1991) the migration of labour and subsequent increase in the income of remaining ones prompts capital for labour replacement which is somehow dependent on migrant transfer's fast-tracking the progression sectoral capitalization. Further, Glytsos, (2002) suggests that growth can be spurred by this process of capital for labour substitution. For developing countries, it is necessary to make an assumption for rationality of income repatriation receivers such that during investment, they will channel it to most productive investment activity.

2.7 Empirical Review

Seetanah and Khadaroo (2002) conducted a study to assess the impact of FDI on economic growth and applied panel data of 39 Sub-Sahara African Countries for the period 1980 to 2000. The study used static and dynamic panel data to estimate the effect of FDI on economic growth for the data on trade openness, annual inflation, Human Capital and real GDP. The finding of the study showed that FDI impacts positively on the economic growth of Sub-Saharan countries.

Alfaro *et. al.* (2006) conducted a study on how FDI promotes growth employing panel data of 34 states in the United States of America. The study sort to explore the effects of financial markets linkages. Using a model that comprised of skilled labour, unskilled labour, financial deepening, consumption expenditure, and skilled and unskilled labor costs, the study established that FDI has either no effect on the recipient country's productivity or negative growth in the host country. The study emphasized on the importance of absorptive capacity of host country. The study contended that good and functioning financial institutions help in augmenting technological innovations as well capital accumulation which foster entrepreneurial activities.

Nyamwange (2009) carried out a study on the link between FDI inflows and economic growth in Kenya applying time series data and ordinary least square technique. Economic growth was regressed on trade openness, FDI, real GDP, human capital and annual inflation. The results of the study revealed that GDP growth had a positive relationship to FDI. The study contributed to the understanding of the level of importance of trade openness and human capita in determining growth as emphasized by Lucas (1990). However, the study measured trade openness as the ratio of imports and exports to GDP which this study finds a methodological flawed which can lead to biased results.

Ocharo *et. at.* (2014) carried out a study which aimed to estimate the relationship between the influxes of private capital, remittances and economic growth in Kenya. The study applied time series data that covered the period 1970 to 2010 and used the Ordinary Least Square (OLS) technique to approximate the association. Economic growth was regressed on human capital, Macroeconomic stability, financial development, trade openness, government expenditure and remittances. The study found a unidirectional causality from FDI as ratio of GDP to economic growth and concluded that government should continue to seek high economic growth rate to attract the capital flows.

Musau (2009) conducted a study on the effect of foreign direct investment on economic growth and development in Kenya. The study used OLS technique to regress the data for the year 2000 -2009 and Economic growth was regressed on FDI, Inflation, Real exchange rate, Trade openness and real interest rate. The finding of the study showed existence of a strong positive association between FDI and economic growth in Kenya.

III. Research Methodology

3.1 Research Design

The purpose of the study was to establish the relationship between foreign direct investments and income repatriation and also established their effects on economic growth in Kenya. The study adopted a quantitative research design, descriptive and inferential analysis based on quantitative data obtained from secondary sources.

3.6 Data type and sources.

To achieve the objectives of the study, time series data gathered from World Bank and Central Bank of Kenya on GDP growth rate, foreign direct investment inflows, income repatriation, Private Domestic Investment, trade openness, inflation, realexchange rate, real interest rate and human capital development for the period 1970 to 2017 will be used.

3.7 Theoretical Framework

In analysis of Income repatriation, and its relationship with FDI and Economic growth, the study will adopt an augmented Solow growth model. The model focuses on four variables namely; Output (Y), Capital (K), Labour (L) and Knowledge or effective labour (A).

$$Y_{(t)} = F(K_{(t)}, A_{(t)} L_{(t)}) \quad (3.1)$$

The theory assumes that output changes overtime only if the input to the production function changes. It further postulates that the amount of output obtained from a given quantity of capital and labor raises overtime. This is so if there is technological progress that will depend on increase in the level of knowledge (Romer, 2012). The study will apply Solow model because of its emphasis of capital as an important contributing factor to economic growth. In application of this model, the study assumes that the capital is composed of Foreign and domestic capital.

$$K_{(t)} = K_{(t)}^{FC} + K_{(t)}^{DC} \quad (3.2)$$

Where $K_{(t)}$ is the stock of capital in the economy at any given time while $K_{(t)}^{FC}$ is Foreign Capital and $K_{(t)}^{DC}$ is Domestic capital respectively.

Starting from augmented Cobb Douglas production function in which output per capita is a function of domestic capital and foreign capital, Equation 3.2 can be expressed in Cobb Douglas for as follow in Equation 3.3

$$Y(t) = AK_{(t)}^{FC\,\beta 1} K_{(t)}^{DC\,\beta 2} L^{1-\beta 1-\beta 2} \; ; \; \beta_1 + \beta_2 + (1-\beta_1-\beta_2) = 1 \quad (3.3)$$

The production function exhibits the property of constant return to scale. Y is the National Output at any given time and A is the total factor productivity. β1, β2 and 1- β1 - β2 represents the input elasticity of foreign capital, domestic capital and Labor respectively. With the Assumption of constant return to scale, the production function can further be represented in its factor intensive form as follows;

$$y_{(t)} = A_{(t)} k_{(t)}^{FC\,\beta 1} k_{(t)}^{DC\,\beta 2} \quad (3.4)$$

Where output per capita $y_{(t)}$ is given by $(\mathbf{Y}_{(t)} / L^{1-\beta 1-\beta 2})$, foreign capital per effective labour $k_{(t)}^{FC}$ is given by $(\mathbf{K}_{(t)}^{\mathbf{FC}} / L^{1-\beta 1-\beta 2})$ while domestic capital per effective labour will be given by $(\mathbf{K}_{(t)}^{\mathbf{DC}} / L^{1-\beta 1-\beta 2})$.

Taking log differences on the intensive production function (3.4) gives the following expression;

$$\ln y_{(t)} = \ln A_{(t)} + \beta_1 \ln k_{(t)}^{FC} + \beta_2 \ln k_{(t)}^{DC} \quad (3.5)$$

The production function can therefore be summarized as:

$$Y = f(\psi) \quad (3.6)$$

Where Y is the dependent variable and ψ represents all the independent variables. In this study FDI was the dependent variable in the first model and ψ represented the independent variables such as; private domestic investment, trade openness, income repatriation, inflation, realexchange rate, real interest rate and human capital development .

In the second model income repatriation was the dependent variable with ψ representing independent variables such as private domestic investment, trade openness, foreign direct investment, inflation, realexchange rate, real interest rate and human capital development.

3.8 Empirical Model

From the Equation 3.6, output is therefore a function of the variables appearing on the right hand side of the Equation. **ψ** was defined in the model to include, Private Domestic Investment (PDI), trade openness (OT), Income Repatriation (IR), inflation (INF), realexchange rate (RER), real interest rate (RIR) and human capital development (HC). However, the model assumes unidirectional and to correct this, the study made use of system of equations as represented by 3.7, 3.8 and 3.9.

GDP = f (FDI, IR, PDI, OT, RER INF, RIR HC) (3.7)

FDI = f (GDP, IR,PDI, OT, RER INF, RIR HC) (3.8)

IR = f (GDP, FDI, PDI, OT, RER INF, RIR HC) (3.9)

Where **FDI** is Foreign Direct investment, **PDI** is Private Domestic Investment, **OT** is trade openness, **IR** is Income Repatriation,**INF** is inflation**, RER** is realexchange rateand **RIR** is real interest rate and **HC** is level of human capital development

To respond to the study objectives, the study used of equations 3.7, 3.8 and 3.9 by applying ARDL models and VAR models. To answer research question 1 and therefore in response to objective 1, equation 3.7, 3.8 and 3.9 was estimated by use of VAR model to give the direction of causality between Income Repatriation and FDI and also impulse response due to shocks originating from a disturbance in one variable as expressed by equations 3.10 and 3.11.

$$FDI_t = \beta_0 + \sum_{i=1}^{k} \beta_i FDI_{t-i} + \sum_{i=0}^{k} \beta_i IR_{t-i} + \sum_{i=0}^{n} X_i + \mu_t \quad (3.10)$$

$$IR_t = \delta_0 + \sum_{i=0}^{k} \delta_i FDI_{t-i} + \sum_{i=1}^{k} \delta_i IR_{t-1} + \sum_{i=0}^{n} Z_i + \mu_t \quad (3.11)$$

Where $\sum_{i=0}^{n} X_i$ and $\sum_{i=0}^{n} Z_i$ are the extraneous variables, k is the number of lags and n is the number of variables

After establishing the direction of causality, ARDL model will be used to estimate the marginal effect. To express the ARDL models equations 3.8 and 3.9 will be expressed in their general functional relationship as indicated by equation 3.12 and 3.13 below.

$$FDI_t = \gamma_0 + \sum_{i=o}^{k} \gamma_{1i} GDP_{t-i} + \sum_{i=1}^{k} \gamma_{2i} FDI_{t-i} + \sum_{i=0}^{n} \gamma_{3i} IR_{t-i} + \sum_{i=0}^{n} \gamma_{4i} OT_{t-i} + \sum_{i=o}^{n} \gamma_{5i} PDI_{t-i} + i{=}0n\gamma 6iRERt{-}i{+}\ i{=}0n\gamma 7iINFt{-}i{+}\ i{=}0n\gamma 8iRIRt{-}i{+}\ i{=}0n\gamma 9iHCt{-}i{+}\varepsilon t \quad (3.12)$$

$$IR_t = \lambda_0 + \sum_{i=1}^{n} \lambda_{1i} GDP_{t-i} + \sum_{i=o}^{n} \lambda_{2i} FDI_{t-i} + \sum_{i=1}^{n} \lambda_{3i} IR_{t-i} + \sum_{i=0}^{n} \lambda_{4i} OT_{t-i} + \sum_{i=o}^{n} \lambda_{5i} PDI_{t-i} + i{=}0n\lambda 6iRERt{-}i{+}\ i{=}0n\lambda 7iINFt{-}i{+}\ i{=}0n\lambda 8iRIRt{-}i{+}\ i{=}0n\lambda 9iHCt{-}i{+}\varepsilon t \quad (3.13)$$

Equations (3.12) and (3.13) gives the general ARDL models which can be rewritten as;

$$FDI_t - \sum_{i=1}^{n} \gamma_{1i} FDI_{t-1} = \gamma_0 + \sum_{i=o}^{n} \gamma_{2i} GDP_{t-1} + \sum_{i=0}^{n} \gamma_{3i} IR_{t-i} + \sum_{i=0}^{n} \gamma_{4i} OT_{t-i} + \sum_{i=o}^{n} \gamma_{5i} PDI_{t-i} + i{=}0n\gamma 6iRERt{-}i{+}\ i{=}0n\gamma 7iINFt{-}i{+}\ i{=}0n\gamma 8iRIRt{-}i{+}\ i{=}0n\gamma 9iHCt{-}i{+}\varepsilon t \quad (3.14)$$

$$IR_t - \sum_{i=1}^{n} \lambda_{1i} IR_{t-1} = \lambda_0 + \sum_{i=o}^{n} \lambda_{2i} GDP_{t-1} + \sum_{i=0}^{n} \lambda_{3i} FDI_{t-1} + \sum_{i=0}^{n} \lambda_{4i} OT_{t-i} + \sum_{i=o}^{n} \lambda_{5i} PDI_{t-i} + i{=}0n\lambda 6iRERt{-}i{+}\ i{=}0n\lambda 7iINFt{-}i{+}\ i{=}0n\lambda 8iRIRt{-}i{+}\ i{=}0n\lambda 9iHCt{-}i{+}\varepsilon t \quad (3.15)$$

Employing a lag operator to the models represented by equations 3.16 and 3.17 above as used by Njaramba et al. (2018), the corresponding equations becomes;

$Z(L)FDI_t = \gamma_0 + \gamma_i(L^i)(GDP)_t + \gamma_i(L^i)(IR)_t + \gamma_i(L^i)(OT)_t + \gamma_i(L^i)(PDI)_t + \gamma_i(L^i)(RER)_t + \gamma_i(L^i)(INF)_t + \gamma_i(L^i)(RIR)_t + \gamma_i(L^i)(HC)_t + \varepsilon_t$ (3.16)

$Q(L)IR_t = \lambda_0 + \lambda_i(L^i)(GDP)_t + \lambda_i(L^i)(FDI)_t + \lambda_i(L^i)(OT)_t + \lambda_i(L^i)(PDI)_t + \lambda_i(L^i)(RER)_t + \lambda_i(L^i)(INF)_t + \lambda_i(L^i)(RIR)_t + \lambda_i(L^i)(HC)_t + \varepsilon_t$ (3.17)

Where;

$(L) = 1 - \sum_{i=1}^{k} X_i$, and letting $\alpha_i(L^i)$, $\gamma_i(L^i)$ and $\lambda_i(L^i)$ represent $\sum_{i=0}^{k}\gamma_i$ and $\sum_{i=0}^{k}\lambda_i$ respectively, the distributed lag form models that defines the long-run relationship can be given by equations 3.18 and 3.19 as follows;

$FDI_t = \frac{\gamma_0}{z(L)} + \frac{\gamma_i(L^i)}{z(L)}(GDP)_t + \frac{\gamma_i(L^i)}{z(L)}(IR)_t + \frac{\gamma_i(L^i)}{z(L)}(OT)_t + \frac{\gamma_i(L^i)}{z(L)}(PDI)_t + \frac{\gamma_i(L^i)}{z(L)}(RER)_t + \frac{\gamma_i(L^i)}{z(L)}(INF)_t + \frac{\gamma_i(L^i)}{z(L)}(RIR)_t + \frac{\gamma_i(L^i)}{z(L)}(HC)_t + \varepsilon_t$ (3.18)

$IR_t = \frac{\lambda_0}{Q(L)} + \frac{\lambda_i(L^i)}{Q(L)}(GDP)_t + \frac{\lambda_i(L^i)}{Q(L)}(FDI)_t + \frac{\lambda_i(L^i)}{Q(L)}(OT)_t + \frac{\lambda_i(L^i)}{Q(L)}(PDI)_t + \frac{\lambda_i(L^i)}{Q(L)}(RER)_t + \frac{\lambda_i(L^i)}{Q(L)}(INF)_t + \frac{\lambda_i(L^i)}{Q(L)}(RIR)_t + \frac{\lambda_i(L^i)}{Q(L)}(HC)_t + \varepsilon_t$ (3.19)

The Long run relationship was concluded if Z (L) and Q (L) are not equal to zero. The coefficients of equations 3.18 and 3.19 gives the long run estimates for the models. The equations will be estimated using the Ordinary least square technique after the models pass diagnostic check. In determining the optimal lag k AIC criterion will be used.

To analyze the Short run relationship, the general ARDL equations 3.12 and 3.13 was utilized and the short-run coefficients will be estimated based on the ARDL models given by equations 3.20 and 3.21 below.

$\Delta FDI_t =$

$\gamma_0 + \sum_{i=1}^{n}\Delta\gamma_{1i}GDP_{t-i} + \sum_{i=o}^{n}\Delta\gamma_{2i}FDI_{t-i} + \sum_{i=0}^{n}\Delta\gamma_{3i}IR_{t-i} + \sum_{i=0}^{n}\Delta\gamma_{4i}OT_{t-i} + \sum_{i=o}^{n}\Delta\gamma_{5i}PDI_{t-i} + i{=}0n\Delta\gamma 6iRERt{-}i{+}\ i{=}0n\Delta\gamma 7iINFt{-}i{+}\ i{=}0n\Delta\gamma 8iRIRt{-}i{+}\ i{=}0n\Delta\gamma 9iHCt{-}i{+}\lambda ECTt{-}1{+}\ \varepsilon t$ (3.20)

$\Delta IR_t = \lambda_0 + \sum_{i=1}^{n}\Delta\lambda_{1i}GDP_{t-i} + \sum_{i=o}^{n}\Delta\lambda_{2i}FDI_{t-i} + \sum_{i=0}^{n}\Delta\lambda_{3i}IR_{t-i} + \sum_{i=0}^{n}\Delta\lambda_{4i}OT_{t-i} + \sum_{i=o}^{n}\Delta\lambda_{5i}PDI_{t-i} + i{=}0n\Delta\lambda 6iRERt{-}i{+}\ i{=}0n\Delta\lambda 7iINFt{-}i{+}\ i{=}0n\Delta\lambda 8iRIRt{-}i{+}\ i{=}0n\Delta\lambda 9iHCt{-}i{+}\varphi ECTt{-}1{+}\ \varepsilon t$ (3.21)

Where

Δ denotes the first difference operator

α_0, γ_0 and λ_0 are the drift component

ε_t is the white noise residue

In response to research question 2 and therefore the 2nd study's objective, the study again used VAR models to estimate equations 3.7 and 3.19 to establish the direction of causality and estimate the impulse response from shock originating from each variable as expressed by equations 3.22 and 3.23 below.

$GDP_t = \beta_0 + \sum_{i=1}^{k}\beta_i GDP_{t-1} + \sum_{i=0}^{k}\beta_i IR_{t-i} + \sum_{i=0}^{n} Y + \mu_t$ (3.22)

$IR_t = \delta_0 + \sum_{i=0}^{k}\delta_i GDP_{t-i} + \sum_{i=1}^{k}\delta_i IR_{t-1} + \sum_{i=0}^{n} V + \mu_t$ (3.23)

Where $\sum_{i=0}^{n} Y$ and $\sum_{i=0}^{n} V$ are the extraneous variables.

ARDL model was utilized to give the Short run and Long run effect of IR on economic growth in Kenya within the same objective. To analyze the long run effect, the general ARDL equations estimated as in equation 3.12 and 3.13 will be used and the Long run coefficients will be estimated by equations 3.24 and 3.25.

$GDP_t = \frac{\alpha_0}{K(L)} + \frac{\alpha_i(L^i)}{K(L)}(FDI)_t + \frac{\alpha_i(L^i)}{K(L)}(IR)_t + \frac{\alpha_i(L^i)}{K(L)}(OT)_t + \frac{\alpha_i(L^i)}{K(L)}(PDI)_t + \frac{\alpha_i(L^i)}{K(L)}(RER)_t + \frac{\alpha_i(L^i)}{K(L)}(INF)_t + \frac{\alpha_i(L^i)}{K(L)}(RIR)_t + \frac{\alpha_i(L^i)}{K(L)}(HC)_t + \varepsilon_t$ (3.24)

$IR_t = \frac{\lambda_0}{Q(L)} + \frac{\lambda_i(L^i)}{Q(L)}(GDP)_t + \frac{\lambda_i(L^i)}{Q(L)}(FDI)_t + \frac{\lambda_i(L^i)}{Q(L)}(OT)_t + \frac{\lambda_i(L^i)}{Q(L)}(PDI)_t + \frac{\lambda_i(L^i)}{Q(L)}(RER)_t + \frac{\lambda_i(L^i)}{Q(L)}(INF)_t + \frac{\lambda_i(L^i)}{Q(L)}(RIR)_t + \frac{\lambda_i(L^i)}{Q(L)}(HC)_t + \varepsilon_t$ (3.25)

The Long run relationship was concluded if K (L), and Q (L) are not equal to zero. The coefficients of equations 3.24 and 3.25 gives the long run estimates for the models. To analyse the short run relationship, the general ARDL equations estimated as in equation (3.12) and (3.13) will be utilized and the short-run coefficients will be estimated based on the ARDL models as given by equations 3.26, and 3.27

$\Delta GDP_t =$

$\alpha_0 + \sum_{i=1}^{n}\Delta\alpha_{1i}GDP_{t-i} + \sum_{i=o}^{n}\Delta\alpha_{2i}FDI_{t-i} + \sum_{i=0}^{n}\Delta\alpha_{3i}IR_{t-i} + \sum_{i=0}^{n}\Delta\alpha_{4i}OT_{t-i} + \sum_{i=o}^{n}\Delta\alpha_{5i}PDI_{t-i} + i{=}0n\Delta\alpha 6iRERt{-}i{+}\ i{=}0n\Delta\alpha 7iINFt{-}i{+}\ i{=}0n\Delta\alpha 8iRIRt{-}i{+}\ i{=}0n\Delta\alpha 9iHCt{-}i{+}\boldsymbol{\lambda} ECTt{-}1{+}\ \varepsilon t$ (3.26)

$\Delta IR_t = \lambda_0 + \sum_{i=1}^{n}\Delta\lambda_{1i}GDP_{t-i} + \sum_{i=o}^{n}\Delta\lambda_{2i}FDI_{t-i} + \sum_{i=0}^{n}\Delta\lambda_{3i}IR_{t-i} + \sum_{i=0}^{n}\Delta\lambda_{4i}OT_{t-i} + \sum_{i=o}^{n}\Delta\lambda_{5i}PDI_{t-i} + i{=}0n\Delta\lambda 6iRERt{-}i{+}\ i{=}0n\Delta\lambda 7iINFt{-}i{+}\ i{=}0n\Delta\lambda 8iRIRt{-}i{+}\ i{=}0n\Delta\lambda 9iHCt{-}i{+}\varphi ECTt{-}1{+}\ \varepsilon t$ (3.27)

Where
Δ denotes the first difference operator
α_0, γ_0 and λ_0 are the drift component
ε_t is the white noise residue

IV. Data Analysis and Interpretation of results.

4.1 Descriptive Results

Table 4.1 gives the descriptive statistics summary based on the data corrected from various sources as mentioned in section 3.6 of chapter three for the period 1970 to 2017.

Table 4.1: Summary statistics of the variables

Variables	Mean	Maximum	Minimum	Std. Dev.	Obsv.
Foreign Direct investment (Million)	7.334	34.57442	0.060979	8.397355	48
Income Repatriation (Million)	12.43	74.08492	0.59	19.88444	43
GDP Per Capita growth rate %	1.284	17.8801	-7.95176	4.026398	48
Human Capital	0.256	0.452323	0.112271	0.101545	48
Inflation	11.905	45.97888	1.554328	8.094112	48
Private Domestic investment (Million)	203.855	591.0353	50.34653	166.7553	48
Real Exchange rate	45.746	103.41	7.020384	33.70167	48
Real Interest rate	6.33	21.09633	-8.009867	7.285397	47
Trade openness	0.596	1.543849	0.38939237	0.299474	43

Note: Std. Dev. Mean's standard deviation while Obsv. Means Number of Observations respectively.
Source: Author Calculation Using the Study Data

On average, Kenya received 7.33 million dollars in form of foreign direct investments between 1970 and 2017. The maximum value recorded was 34.57 million dollars while the minimum value in the same period was 0.06 million dollars. A standard deviation of 8.4 million dollars indicates a high variation from the mean during the period under study. The statistics also shows that on average 12.43 million dollars were repatriated to foreign countries with a range of 0.59 million dollars to 74 million dollars and a standard deviation of 19.88. This standard deviation indicates a high variation from the mean. Income repatriated is on average higher than foreign direct investment recorded within the same period. These figures are consistent with the claim made by this study that income repatriated remained significantly high between 2008 to 2014 with some instances doubling the volume of FDI recorded lowering the benefits associated to FDI.

GDP Per Capita Growth rate was used in the study with the aim of establishing its relationship to income repatriation. This was to reveal if income repatriation has a positive effect on GDP per capita growth rate in the long run given increasing income repatriation. The average GDP per capita growth rate is 1.284 percent with a range of -7.95176 percent and 17.8801 percent and a standard deviation of 4.026398. The standard deviation of GDP per capita growth rate is higher than the mean indicating a high variation from the mean. The other variables Human Capital, Inflation, Private domestic investment, real exchange rate, real interest rate and trade openness were used as extraneous variables in the study due to the effect on the variables of interest which were Income repatriation, foreign direct investment and Economic growth.

4.3 Time series Property results

The study used time series data to achieve the objectives. Time series data is susceptible to the problem of spurious results (Gujarati, 2004). To check the time series properties of the data, tests carried out are as discussed in section 4.3.1 and 4.3.2. GDP per capita growth rate was used as a proxy for Economic growth as GDP was found not to be stationary at second difference hence not suitable for the ARDL model. GDP per capita growth rate was found to be stationary at first difference.

4.3.1 Unit root test

To avoid unbiased results steaming from existence of unit root in the variables, Augmented Dickey – Fuller (ADF) was used to test for non-stationarity to determine the order of integration for each variable. The unit root test performed established that, Private domestic investment, GDP per capita growth, Inflation and Real interest rate were stationary at levels and therefore integrated of order zero I(0). FDI, Income repatriation, human capital, real exchange rate and trade openness were stationary at first difference hence integrated of order one I(1). The study used GDP per capita instead of GDP, as GDP was only stationary at second difference, which would have made it impossible to use the ARDL model. The unit root test results are presented on Table 4.2 below.

Table 4.2: Unit root test results

Variable	Type of test	Form of Test	Test statistics	Critical value at 5%	Conclusion
1st difference of Foreign Direct investment	ADF	Intercept	-8.53006	-2.92814	Stationary
GDP per capita growth (annual %)	ADF	Intercept	-5.58531	-2.92517	Stationary
1st difference of Trade openness	ADF	Intercept	-4.95633	-2.92973	Stationary
Private Domestic Investment	ADF	Intercept	-4.21041	-2.94115	Stationary
Inflation	ADF	Intercept	-4.00189	-2.92517	Stationary
1st difference of Real Exchange rate	ADF	Intercept	-6.48664	-2.92662	Stationary
Real interest rate	ADF	Intercept	-4.33486	-2.92662	Stationary
1st difference of Human capital	ADF	Intercept	-6.6205	-2.92662	Stationary
1st difference of Income repatriation	ADF	Intercept	-3.34325	-2.93899	Stationary

The series were also subjected to conitegration test in order to qualify them for use in the ARDL and VAR models.

4.3.2 Cointegration test

To test for cointegartion, the study applied the ARDL bound test. ARDL bound test was carried out to determine if the independent variables have a long run relationship with the dependent variable since the entire variables in the study were not integrated of the same order. Akaike's Information Criterion (AIC) was automatically used to generate the maximum lag for equations 3.20 and 3.26. Joined parameters of the lagged variable were tested for cointegration as per the hypothesis in section 3.7.2 of chapter 3. If the F statistics is above the upper bound, the null hypothesis of no long-run relationship is rejected. If the F statistics falls below the lower bound, the null hypothesis is not rejected and if F statistics falls between the upper and lower bound, the results are said to be inconclusive (Pesaran, 2001). The bound tests are given in table 4.3 and 4.4

Table 4.3 ARDL Bound Test for Model 3.20

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	5.038511	5
Critical Value Bounds		
Significance	I(0) Bound (lower bound)	I(1) Bound (upper bound)
10%	2.26	3.35
5%	2.62	3.79
2.50%	2.96	4.18
1%	3.41	4.68

Source: Author's calculations.

Table 4.4 ARDL Bound Test for Model 3.26

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	5.194270	5
Critical Value Bounds		
Significance	I(0) Bound (lower bound)	I(1) Bound (upper bound)
10%	2.26	3.35
5%	2.62	3.79
2.50%	2.96	4.18
1%	3.41	4.68

Source: Author's calculations.

Table 4.3 and 4.4 shows that F statistics is greater than upper bound at 1% significance level and as such, it was concluded that there exist a long run relationship between the dependent variable and the independent variables. ARDL model could therefore be utilized to derive the long run and the short run effects.

4.4 Diagnostic and Stability Tests for the VAR Models

The study conducted the diagnostic test to VAR results to ensure that the results are reliable, consistent and unbiased. Several tests were conducted as discussed in sections 4.4.1, 4.4.2 and 4.5.3

4.4.1 Residual Serial Correlation LM Tests

The presence of autocorrelation was tested on the null hypothesis that there is no autocorrelation among the residuals. The test results are presented in Table A2.13 and Table A2.14 of the Appendix 2 for the two models estimated by equation 3.10 and 3.22 in Chapter three. The p-value of the LM test X^2 was greater than 0.05 and therefore the null hypothesis of no autocorrelation at 5% level of significance could not be rejected.

4.4.2 Heteroskedasticity Tests

The VAR models were tested for problem of heteroskedaticity to avoid inconsistent results. The test were made on the null hypothesis of homoskedaticity and the results given in Table A2.15 and Table A2.16 of the Appendix 2 shows that the P value of the Chi-square for the models estimated by equation 3.10 and 3.22 is greater than 0.05, therefore the null hypothesis of homoskdaticity could not be rejected .

4.4.3 VAR model stability test

The stability of the VAR model was conducted to confirm the adequacy and suitability of the parameters in the models across all the data employed. The stability of the models was done through inverse root AR polynomial stability test. If all the companion matrix root lay within the circle, then the VAR model is stable. The stability results are presented in in Figure A2.1 and Figure A2.2 of the Appendix 2. The results confirm stability of the VAR models

4.5 Diagnostic and Stability Tests for ARDL Models

The study models were estimated using the OLS. For this method to give unbiased, consistent and reliable results, certain assumption must be met before the results are adopted to address the study objectives. Diagnostic tests were therefore conducted to determine the soundness of the ARDL and VAR models. The diagnostic tests for the general ARDL Models 3.12 and 3.13 whose results presented in appendix 2 are discussed in sections 4.5.1, 4.5.2, 4.5.3, and 4.5.4. Stability tests for the ARDL models were conducted as well and the results discussed in section 4.5.5.

4.5.1 Normality Tests

To check for normality, Jarque- Bera (JB) test was applied to determine if the residuals were normally distributed. The null hypothesis that residuals were normally distributed was tested and the results are presented in figures A2.1 and A2.2 of the Appendix 2. The results indicates that the probability value (P- Value) of the Jarque – Bera statistics are 0.451375 and 0.699477 which were greater than 0.05, thus the null hypothesis that residuals are normally distributed could not be rejected at 5% level of significance. These results ascertain that data used to estimate coefficients is normally distributed and that the t statistic and F statistic could be used to test hypothesis.

4.5.2 Serial correlation Test

The presence of autocorrelation was tested using Breusch- Godfrey LM serial correlation test, on the null hypothesis that there is no autocorrelation among the residuals against the alternative hypothesis of existence of autocorrelation as indicated in section 3.8.4 of chapter three. The results presented in Table A2. 7 and Table A2.8 of the Appendix 2 for the two models 3.12 and 3.13 showed no evidence of autocorrelation. The p-value of the LM test X^2 were 0.7909 and 0.5449and therefore the null hypothesis of no autocorrelation at 5% level of significance could not be rejected.

4.5.3 Heteroskedasticity Test

The models were tested for heteroskedaticity using ARCH test. The results of ARCH test are presented in Table A2.9 and Table A2.10 of Appendix 2. The P-value for the ARCH X^2 statistics were 0.8378 and 0.1809for the models 3.12 and 3.13 respectively. The null hypothesis of homoskedasticity could not be rejected at 5% level of significance.

4.5.4 Multicollinearity Test

The study assessed presence of multicollinearity among the variables by developing a correlation matrix. Pair-wise correlation matrix was used to determine the extent to which variables were collated to avoid

serious multicollinearity that would undermine the reliability of the results. The results given in Table A2.6 of the Appendix 2 do not show evidence of highly correlated variables.

4.5.5 Model Stability Test.

To evaluate the stability of the ARDL parameter and their consistency, the study utilized CUSUM stability test. Figure A2.3 and Figure A2.4 presented in Appendix 2shows the results for the two ARDL models used in the study. The two Figures indicates that estimates fall within the accepted region at 95% confidence level, which means the parameters are stable.

4.6 Relationship between Income Repatriation and FDI in Kenya

The first objective of the study was to establish the relationship between Income Repatriation and FDI in Kenya. The study achieved the objective one in two parts as elaborated in chapter three. The first part was to establish the direction of causality and impulse response and the second part was to assess short run and long run marginal effect between Income repatriation and FDI. The first part of the objective was achieved through the VAR model while the second part of the same objective was achieved through the ARDL model.

4.6.1 Direction of Causality and impulse response between Income repatriation and FDI

The first part of the first objective was to analysis the direction of causality between Income repatriation and FDI. To achieve this, Vector autoregressive model (VAR) was utilized and Equation 3.10 in Chapter three was estimated and results of the VAR model are given by Table A2.11 of Appendix 2. Granger causality test was estimated to determine the direction of causality and the results of causality are presented in Table 4.4 below

Table 4.4: Granger Causality results

Dependent variable: Income Repatriation			
Excluded	Chi-sq	df	Prob.
Foreign Direct Investment	29.80901	5	0.0000
All	29.80901	5	0.0000
Dependent variable: Foreign Direct Investment			
Excluded	Chi-sq	df	Prob.
Income Repatriation	17.79571	5	0.0032
All	17.79571	5	0.0032

Source: Author's calculations.

From the result above Income repatriation and Foreign Direct Investment shows a bicausality. That is, Income repatriation Granger causes foreign direct investment and foreign direct investment Granger causes Income reparation. The bidirectional causality is significant at 5% significant level, therefore we reject the null hypothesis that Income repatriation does not Granger cause Foreign direct investment and accept the alternative hypothesis of the two way causality that Income repatriation Granger causes Foreign Direct Investment and vice versa.

4.6.2 Short-run and Long-run Marginal effect of Income repatriation on FDI

The short-run estimates were obtained in two levels. The first level involved estimating the cointegrating ARDL equation 3.12. Residuals from the estimation were then lagged once (ECT-1) and used in the second level to estimate the ARDL model given by equation 3.20. The output coefficients presented in Table 4.4 below describes the Short run effect of independent variable to the dependent variable.

Table 4.5: Short run effect of various variables on Foreign Direct Investment

Dependent Variable	**Foreign Direct Investment**			
Regressors	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Δ Income Repatriation	[0.492577]***	0.161005	3.059388	0.0045
Δ Income Repatriation lagged once	[0.276047]***	0.0928	2.974633	0.0055
Δ GDP Per Capita Growth	[0.589963]	0.372675	1.583049	0.1232
Δ GDP Per Capita Growth Lagged once	[-0.549477]**	0.214942	-2.556393	0.0155
Δ Inflation	[0.030462]	0.103358	0.294725	0.7701
Δ Inflation lagged once	[-0.154508]	0.092051	-1.678506	0.103
Δ Real Exchange Rate	[0.142053]**	0.059697	2.379547	0.0235
Δ Private Domestic investment	[-0.029019]	0.027609	-1.051095	0.3011
Error Correction Term (ECT)	[-1.57578]***	0.208775	-7.547749	0.0000

Note: [***], [**] and [*] denote significance levels at 1%, 5% and 10% respectively.
Δ Denotes the first difference operator
Source: Author's calculations

Income repatriation coefficient is positive and statistically significant for the first and second year at 1 percent significance level in the short run. This implies that one unit change in income repatriation increases FDI by 49.3 percent in the first year and 27.6% in the second year holding other factors constant. This is consistent with the claim made by the study, that foreigners will be highly motivated to invest more in an environment that allows them to invest and freely repatriate their income back home, hence the positive effect. GDP per capita growth rate coefficient is not statistically significant in the first year but becomes significant and negative in the second year. This implies that, in the second year, a unit increase in FDI, causes 0.5 decline on GDP. This could be due to increased repatriation of income by the foreigners back to their home country. Real exchange rate is positive and statically significant at 5%. This implies that one unit change in real exchange rate increases FDI by 14.2% in the first year holding all the other factors constant. This is theoretically plausible given that profit is an increasing function of both input and output prices. The effect of private domestic investment was not significant in the short run. Error Correction Term was negative and statistically significant. However, ECT term was outside the bound of 0 and 1. This implies that any misalignment is well corrected early enough before the end of one year.

The Long run estimates were also extracted to show how FDI reacted to permanent change in the independent variables. The long run estimates were achieved through estimation of the ARDL model given by Equation 3.18 of Chapter three and the results are given in Table 4.5.

Table 4.6: Long run ARDL results

Dependent Variable	**Foreign Direct Investment**			
Regressors	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Income Repatriation	[0.23293]***	0.048489	4.803756	0.0000
GDP Per Capita Growth	[0.795435]**	0.34273	2.320881	0.0268
Inflation	[0.150038]*	0.076209	1.968769	0.0577
Real Exchange Rate	[0.090148]***	0.03268	2.758458	0.0095
Private Domestic investment	[0.028159]**	0.010629	2.649236	0.0124
C	[-8.667201[***	3.145433	-2.755487	0.0096

Note: [***], [**] and [*] denotes significant level at 1%, 5% and 10% respectively.
Source: Author's calculation.

In the long run, income repatriation coefficient is positive and significant at 1 percent significant level indicating that income repatriation has a long run positive effect on FDI. A one unit change in income repatriation increase FDI by 0.23 in the long run. GDP per capita coefficient is positive and statistically significant at 5 percent. This implies that 1percent change in the GDP per capita growth rate increases FDI by 79 percent. This could be due to effective demand created in the economy when the wealth of people measured through GDP per capita growth rate increase. Inflation is positive and statistically insignificant in the long run. The coefficient for the real exchange rate is positive at significant at 1percent significant level indicting that real exchange rate has a long run positive effect on FDI. This would imply that 1percent change in real exchange rate increases FDI inflows by 0.09 holding all factors constant. Private domestic investment is positive and significant at 5 percent significance level implying a long run effect to GDP. Holding the other factors constant a unit change in private domestic investment will increase FDI by 0.03 million dollars.

To analyse the impulse response the study used unrestricted VAR to calculate the function. The results are presented in Figure 4.1 below.

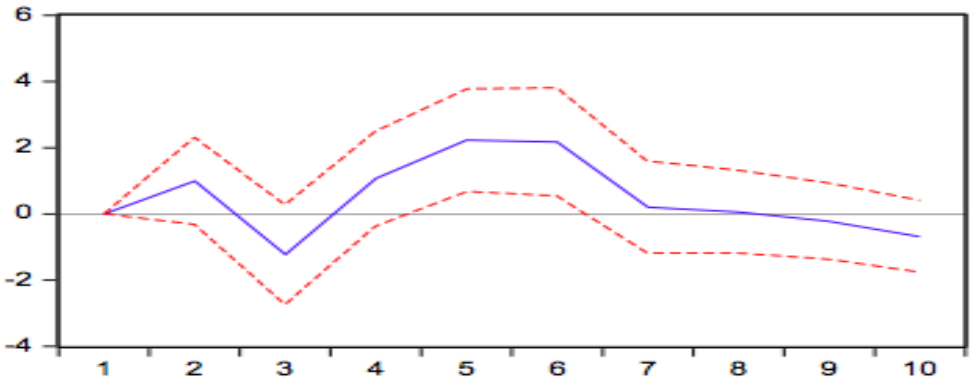

Figure 4.1 Impulse Response of Income Repatriation to Foreign Direct Investment
Source: Author's calculation

The Figure above shows the impact on FDI from the shocks coming from Income repatriation. It exhibits a positive impact, which becomes negative in the second year and positive between the fourth and eighth year before the effect becomes negative from eighth year. A shock in Income repatriation appearing in the first period takes over ten years to disappear. Figure 4.2 shows how FDI responds to the shocks income repatriation.

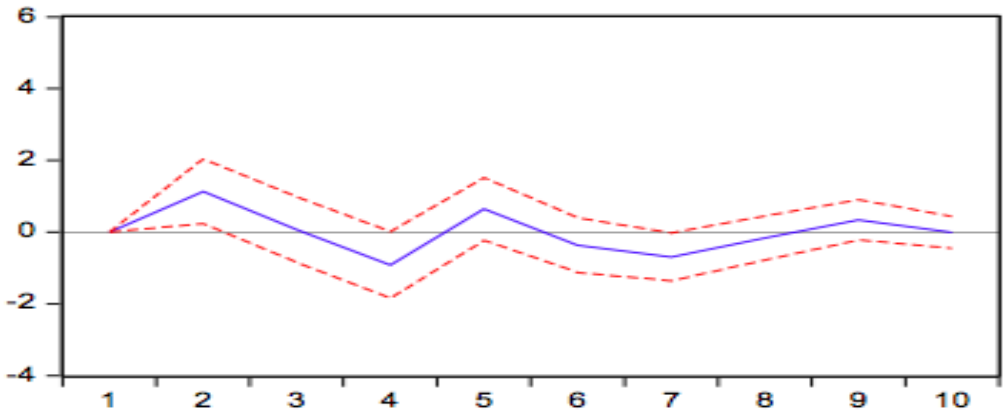

Figure 4.2 Impulse Response of Foreign Direct Investment to Income Repatriation
Source: Author's calculation

From the Figure above, a shocks appearing at the first period will take ten years to disappear. If there is a shock on FDI today, its effect on income reparation will take about ten years to disappear.

4.7 Relationship between Income Repatriation and Economic growth in Kenya

To analyse the second objective on establishing the relationship between Income Repatriation and Economic Growth in Kenya, ARDL and VAR models were utilized. VAR model was used to show the direction of causality and impulse response while the ARDL was used to establish the marginal effect between income repatriation and economic growth in short run and long run.

4.7.1 Direction of Causality and impulse response between Income repatriation on Economic growth.

The first part of the second objective was to analysis the direction of causality between income repatriation and Economic growth in order to determine the direction of causality and impulse response. To achieve this, Vector Autoregressive model (VAR) was utilized and Equation 3.22 in Chapter three was estimated. The results of the VAR model output are given by Table A2.12 of Appendix 2. Using the VAR model output, granger causality test was estimated to determine the direction of causality and the results are presented in Table 4.7 below

Table 4.7: Granger Causality results

Dependent variable: Income Repatriation			
Excluded	Chi-sq	df	Prob.
Dependent variable: GDP per Capitagrowth	27.59045	2	0.0000
All	27.59045	2	0.0000
Dependent variable: GDP per Capita growth			
Excluded	Chi-sq	df	Prob.
Income Repatriation	6.324306	2	0.0423
All	6.324306	2	0.0423

Source: Author's calculations.

From the result above income repatriation and GDP per capita growth shows a bi-causality relationship. That is, income repatriation granger causes GDP per capita growth and GDP per capita growth granger causes income reparation. The bi-directional causality is significant at 5% significant level, therefore the null hypothesis is rejected that income repatriation does not granger cause GDP per capita growth and accept the alternative hypothesis of the two way causality that income repatriation granger causes GDP per capita growth and vice versa.

4.7.2 Short-run and Long-run Marginal effect of Income repatriation on Economic growth

To estimate the short run estimates, conitergrating ARDL model was estimated on equation 3.12 and the residues from the estimates were lagged once (ECT-1) and used to estimate the ARDL model given by equation 3.26 the short run effect is presented in table 4.8.

Table 4.8: Short run effect of various variables on GDP per Capita growth rate.

Dependent Variable	**GDP per Capita growth rate**			
Regressors	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Income Repatriation	[-0.141925]**	0.053421	-2.656709	0.0116
Foreign Direct Investment	[0.164974]*	0.082553	1.998398	0.0531
Private Domestic Investment	[0.064297]***	0.011805	5.44663	0.0000
Human capital	[-6.503968]	6.657178	-0.976986	0.3349
Real Interest rate	[0.09824]	0.066945	1.467482	0.1507
Error Correction term (ECT)	[-0.993591]***	0.113939	-8.720354	0.0000

Note: [***], [**] and [*] denote significance levels at 1%, 5% and 10% respectively.
Δ Denotes the first difference operator
Source: Author's calculations

Income repatriation coefficient is negative and statistically significant at 5% significance level. This implies that one unit change in Income Repatriation decreases GDP per capita growth by 0.098986 in the current year holding the other factors constant. This is consistent with the claim made by the study, that increase in the income repatriated reduces the economic growth in the short run. Foreign direct investment coefficient is positive and statistically significant in the short run. Private Domestic investment has a positive effect to GDP per capita growth rate in the short run as noted by the positive coefficient significant at 1percent significance level. A one unit change in private domestic investments increase the GDP per capita growth by 0.06. The human capita and real interest rate were found not to be statically significant in the short run.

The Long run estimates were also extracted to show how GDP per capita growth reacted to permanent change in the independent variables. The long run estimates were achieved through estimation of the ARDL model given by Equation 3.24 of Chapter three and the results are given by Table 4.9.

Table 4.9: Long run ARDL results

Dependent Variable	**GDP per Capita growth rate**			
Regressors	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Income Repatriation	[-0.105188]***	0.034918	-3.012416	0.0047
Foreign Direct Investment	[0.166038]*	0.082154	2.021057	0.0506
Private Domestic Investment	[0.010665]***	0.003847	2.772529	0.0087
Human capital	[3.482816]	4.496032	0.774642	0.4435
Real Interest rate	[0.098874]	0.070445	1.403559	0.1688
Constant	[-1.710824]	1.712811	-0.99884	0.3244

Note: [***], [**] and [*] denotes significant level at 1%, 5% and 10% respectively.
Source: Author's calculation.

The coefficient of Income repatriation is negative and significant at 1% significance level, indicating that Income repatriation has negative effect on GDP per capita growth in the Long run. A unit change in Income repatriation reduces GDP per capita growth by 0.10518 holding all the other factors constant. Foreign direct investment was found to have a positive effect to GDP per capita growth rate only at 10 percent level of significance. The coefficient for the private domestic investment is positive and significant at 1 percent significant level. This indicates that private domestic investment has a long run effect on GDP per capita growth rate. A unit change in private domestic investment increases GDP per capita growth rate by 0.010665 holding all the other factors constant.

To analyze the impact response, unrestricted VAR model was used. Figure 4.3 and 4.4 shows the impact response.

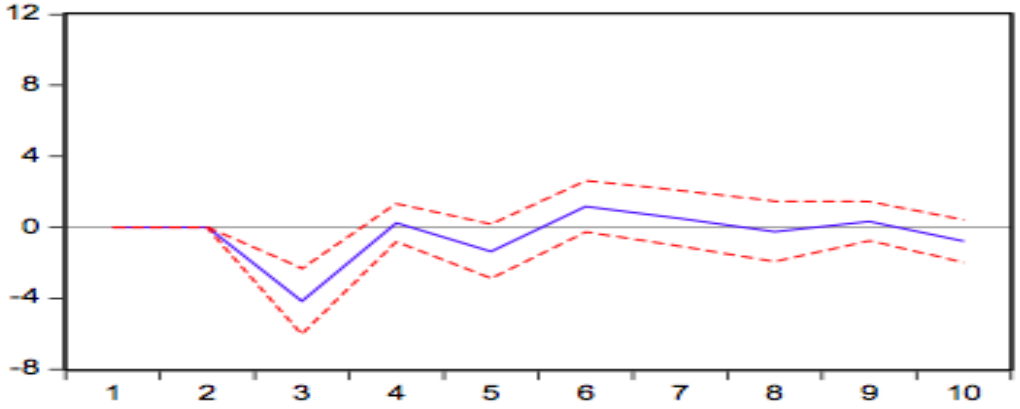

Figure 4.3: Impulse Response of Income Repatriation to GDP per Capita growth
Source: Author's calculation

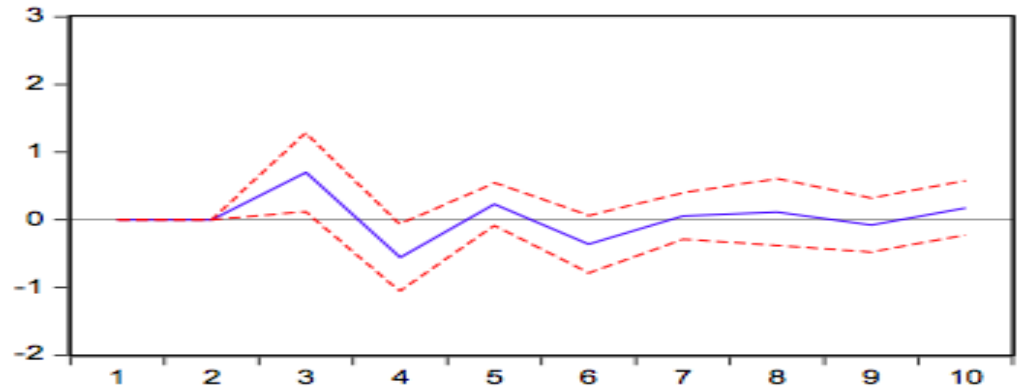

Figure 4.4: Impulse Response of GDP per Capita to growth Income Repatriation
Source: Author's calculation

Figure 4.3 shows the impact on income repatriation from the shocks emanating from GDP per capita growth. The impact of GDP per capita growth is negative but becomes positive on the fifth year before levelling to the equilibrium in the eighth year. Figure 4.4 shows the impact of GDP per capita growth from the shocks emanating from income repatriation. The Impact is positive but becomes negative from third year to fifth year and oscillates around the equilibrium.

V. Summary of the finding, Conclusion and Recommendations.

5.2 Summary

The general objective of the study was to determine the relationship between income repatriation and FDI in Kenya using the time series data from 1970 to 2017. The data used in the study was extracted from World Bank, UNTCAD and Central bank of Kenya. To achieve the objective the study, VAR and ARDL model were used to analyze the data. Variables used in the study included; Foreign direct investment, income repatriation, GDP per capita growth rate, human capital, real exchange rate, real interest rate, trade openness, private domestic investment and inflation.

VAR results indicated a bi-causality relationship between income repatriation and FDI. Having established the direction of causality, ARDL model was employed in order to avoid endogeneity problem and to determine the short run and long run effect between income repatriation and FDI. The estimated ARDL model showed that income repatriation has a positive effect on FDI both in the short run and in the long run. This would imply that investors will tend to invest more in an environment that allows them to repatriate freely their earnings back to their home country.

5.3 Conclusions

This study concludes that income repatriation encourages and increases the volume of foreign direct investment inflows into a country both in the short run and in the long run however the focus needs to shift from foreign direct investment to growing private domestic investments as private domestic investment has a positive effect on foreign direct investments in the long run.

5.4 Policy Implications

Following the finding of the study, the government should focus on putting in place policies that support and creates an enabling environment for private domestic investment. This is because private domestic investment has a positive effect on both economic growth and foreign direct investments in the long run. While policies to attract foreign direct investment are good given that foreign direct investments positively affects economic growth, the government should review the existing policies that allow the foreigners to freely repatriate their earnings back home after taxation and perhaps institute policies that require them to investment a certain percentage of their earnings into the country, as this repatriation has a detrimental effect to economic growth. Additionally, the government should also put in place policies on stabilizing the exchange rate, as real exchange rate has a positive effect on FDI.

5.4 Areas of further research

This study was limited to establishing the relationship between income repatriation, foreign direct investment and economic growth in Kenya. This study therefore leaves some areas of further research and in particular, there is a need to investigate how income repatriation affects the foreign reserves of a country and second, there is a need to investigate on the determinants of foreign earning reinvestments. This will help the government to formulate policies that are focused on drivers of reinvestments of foreign earnings as opposed to incentives geared to attracting FDI inflows with no commitment for reinvestments of the earnings to the host country.

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Appendix 1

Table A1.1 Study Data (1970 – 2017)

FDI (Real Values in Millions US$)	GDP per capita growth (annual %)	TO	PDI (Real Values in Millions US$)	INF	RER/NER	RIR	HC	IR (Real Values in Millions US$)
15.45671	-7.95176	-	353.4747	2.18853	7.14286		0.2373	-
7.98648	17.8801	-	435.7593	3.78021	7.14286	20.06939	0.23971	-
6.42464	12.90832	-	467.5991	5.83164	7.14286	7.70193	0.23839	-
16.10658	2.07506	-	477.4877	9.28119	7.02038	-1.09238	0.23523	-
18.55101	0.27342	-	450.2939	17.80995	7.13481	-5.64353	0.16947	-
11.40987	-2.82263	0.70293	438.085	19.12018	7.34319	-1.64091	0.17651	48.89945
27.66772	-1.61699	0.69782	414.2028	11.44903	8.36714	7.49008	0.20327	59.47133
29.38283	5.39662	0.71794	489.7265	14.82096	8.27656	-5.90234	0.20901	74.08492
15.29333	2.92941	0.72378	591.0353	16.93178	7.72938	6.7122	0.2325	67.49761
34.57442	3.57975	0.61729	491.8927	7.97935	7.47531	4.12856	0.20008	61.44117
28.54585	1.60799	0.70966	481.1778	13.85818	7.42019	0.94259	0.22041	54.16891
4.58211	-0.15922	0.63808	413.1775	11.60305	9.0475	1.41051	0.22146	28.5666
3.48955	-2.34201	0.57489	328.4751	20.66671	10.92232	2.60541	0.21782	7.54432
5.71978	-2.51337	0.54814	260.9706	11.39778	13.31152	3.57239	0.2291	16.63443
2.34941	-2.04279	0.58616	232.0304	10.2841	14.41387	3.83512	0.25107	20.18974
5.57684	0.46647	0.57339	204.856	13.00657	16.43212	5.25754	0.3283	19.88368
6.17056	3.30324	0.55944	268.023	2.53428	16.22574	4.8645	0.32661	16.45482
6.83509	2.17393	0.52515	271.5136	8.63767	16.45449	8.15739	0.34738	14.87266
0.06098	2.50436	0.54928	264.121	12.26496	17.7471	8.02623	0.34996	13.91193
8.44945	1.12347	0.58327	218.9789	13.78932	20.57247	6.81521	0.14596	13.51489
6.58449	0.72483	0.62544	204.1797	17.78181	22.91477	7.3328	0.14091	15.23797
1.80891	-1.8591	0.60976	149.0117	20.0845	27.50787	5.74551	0.13839	5.66348
0.48004	-3.95018	0.57063	102.6885	27.33236	32.21683	1.82533	0.13764	9.4743
7.52733	-2.75743	1.54385	50.34653	45.97888	58.00133	3.41347	0.11227	1.94549
0.29818	-0.46822	1.42627	54.12349	28.81439	56.05058	16.42811	0.136	2.72228
1.67063	1.33143	1.08054	76.42665	1.55433	51.42983	15.80165	0.13929	4.56486
3.94356	1.1555	0.79705	69.97942	8.86409	57.11487	-5.77659	0.11759	1.56607
2.02348	-2.34717	0.88306	65.76634	11.36185	58.73184	16.87957	0.12109	1.34584
0.81061	0.43969	0.93117	67.45627	6.72244	60.3667	21.09633	0.14509	1.3346
1.50017	-0.48516	1.00573	58.05887	5.742	70.32622	17.45405	0.38102	1.15207
2.91181	-2.12517	0.53216	55.73726	9.98003	76.17554	15.32743	0.3791	0.75258
0.13167	0.98702	0.56012	58.52875	5.7386	78.5632	17.8125	0.38836	1.20205

0.67258	-2.14371	0.55499	55.18922	1.96131	78.74914	17.35814	0.4208	1.83776
1.81261	0.18086	0.54191	52.34846	9.81569	75.93557	9.77051	0.37811	0.71983
0.91513	2.28318	0.60818	51.99027	11.62404	79.17388	5.04526	0.40877	0.60866
0.38201	3.04501	0.65835	63.10129	10.31278	75.55411	7.60999	0.40629	0.62894
0.79737	3.5762	0.55704	78.93399	14.45373	72.10084	-8.00987	0.42347	0.61234
10.45155	3.93308	0.55032	91.46868	9.75888	67.31764	4.81909	0.40808	1.77782
1.08548	-2.50337	0.59193	76.8991	26.23982	69.17532	-0.985	0.45232	0.59023
1.20863	0.50386	0.5154	71.22239	9.23413	77.35201	2.83708	0.44815	0.62705
1.78065	5.49408	0.57376	81.48693	3.96139	79.23315	12.02823	0.17678	0.60365
12.72095	3.28814	0.64295	75.02605	14.02249	88.81077	3.83851	0.18489	1.96896
11.0666	1.81574	0.59766	85.49552	9.37777	84.5296	9.45662	0.23777	3.35072
8.48586	3.14221	0.55432	85.9613	5.71749	86.12288	11.54784	0.21347	4.10163
5.82579	2.69479	0.54327	99.77048	6.87815	87.92	7.8151	0.23432	5.07669
4.12628	3.11662	0.46817	92.12141	6.58217	102.19	5.50932	0.2536	3.97405
2.46393	3.34625	0.38939	76.40674	6.29716	101.5	10.42982	0.26466	3.46589
3.89431	2.42002	0.39291	82.42124	8.00572	103.41	2.78262	0.2721	2.59752

Appendix 2 : Table A2.1: Unit Root Tests

Variable	**Type of test**	**Form of Test**	**Test statistics**	**Critical value at 5%**	**Conclusion**
1st difference of Foreign Direct investment	ADF	Intercept	-8.53006	-2.92814	Stationary
GDP per capita growth (annual %)	ADF	Intercept	-5.58531	-2.92517	Stationary
1st difference of Trade openness	ADF	Intercept	-4.95633	-2.92973	Stationary
Private Domestic Investment	ADF	Intercept	-4.21041	-2.94115	Stationary
Inflation	ADF	Intercept	-4.00189	-2.92517	Stationary
1st difference of Real Exchange rate	ADF	Intercept	-6.48664	-2.92662	Stationary
Real interest rate	ADF	Intercept	-4.33486	-2.92662	Stationary
1st difference of Human capital	ADF	Intercept	-6.6205	-2.92662	Stationary
1st difference of Income repatriation	ADF	Intercept	-3.34325	-2.93899	Stationary

Table A2.4: General ARDL Model Results - 1

Dependent Variable: FDI__REAL_VALUES_IN_MILL
Method: ARDL
Date: 09/15/19 Time: 00:31
Sample (adjusted): 1972 2017
Included observations: 46 after adjustments
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (3 lags, automatic): IR__REAL_VALUES_IN_MILLI GDP_PER_CAPITA_GROWTH__A INF RER_NER PDI__REAL_VALUES_IN_MILL
Fixed regressors: C
Number of models evalulated: 2048
Selected Model: ARDL(2, 1, 2, 2, 0, 1)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
FDI__REAL_VALUES_IN_MILL(-1)	-0.083203	0.145002	-0.573806	0.5701
FDI__REAL_VALUES_IN_MILL(-2)	-0.492577	0.161005	-3.059388	0.0045
IR__REAL_VALUES_IN_MILLI	0.276047	0.092800	2.974633	0.0055
IR__REAL_VALUES_IN_MILLI(-1)	0.091000	0.081971	1.110152	0.2752
GDP_PER_CAPITA_GROWTH__A	0.589963	0.372675	1.583049	0.1232
GDP_PER_CAPITA_GROWTH__A(-1)	0.113991	0.302213	0.377188	0.7085
GDP_PER_CAPITA_GROWTH__A(-2)	0.549477	0.214942	2.556393	0.0155
INF	0.030462	0.103358	0.294725	0.7701
INF(-1)	0.051457	0.109555	0.469687	0.6418
INF(-2)	0.154508	0.092051	1.678506	0.1030
RER_NER	0.142053	0.059697	2.379547	0.0235
PDI__REAL_VALUES_IN_MILL	-0.029019	0.027609	-1.051095	0.3011
PDI__REAL_VALUES_IN_MILL(-1)	0.073391	0.025246	2.907085	0.0066
C	-13.65760	5.635259	-2.423598	0.0212

R-squared	0.842015	Mean dependent var	7.142839
Adjusted R-squared	0.777834	S.D. dependent var	8.493326
S.E. of regression	4.003283	Akaike info criterion	5.857897
Sum squared resid	512.8408	Schwarz criterion	6.414440
Log likelihood	-120.7316	Hannan-Quinn criter.	6.066381
F-statistic	13.11935	Durbin-Watson stat	1.863704
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Table A2.5: General ARDL Model Results - 2

Dependent Variable: GDP_PER_CAPITA_GROWTH__A
Method: ARDL
Date: 09/15/19 Time: 12:03
Sample (adjusted): 1971 2017
Included observations: 47 after adjustments
Maximum dependent lags: 3 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (1 lag, automatic): IR__REAL_VALUES_IN_MILLI FDI__REAL_VALUES_IN_MILL PDI__REAL_VALUES_IN_MILL HC RIR

Fixed regressors: C
Number of models evalulated: 96
Selected Model: ARDL(1, 1, 0, 1, 1, 0)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP_PER_CAPITA_GROWTH__A(-1)	0.006409	0.113939	0.056246	0.9554
IR__REAL_VALUES_IN_MILLI	-0.141925	0.053421	-2.656709	0.0116
IR__REAL_VALUES_IN_MILLI(-1)	0.037411	0.045166	0.828304	0.4128
FDI__REAL_VALUES_IN_MILL	0.164974	0.082553	1.998398	0.0531
PDI__REAL_VALUES_IN_MILL	0.064297	0.011805	5.446630	0.0000
PDI__REAL_VALUES_IN_MILL(-1)	-0.053701	0.011728	-4.578695	0.0001
HC	-6.503968	6.657178	-0.976986	0.3349
HC(-1)	9.964463	6.547843	1.521793	0.1366
RIR	0.098240	0.066945	1.467482	0.1507
C	-1.699860	1.692206	-1.004523	0.3217

R-squared	0.598387	Mean dependent var	1.480088
Adjusted R-squared	0.500698	S.D. dependent var	3.830234
S.E. of regression	2.706494	Akaike info criterion	5.015488
Sum squared resid	271.0291	Schwarz criterion	5.409136
Log likelihood	-107.8640	Hannan-Quinn criter.	5.163620
F-statistic	6.125394	Durbin-Watson stat	1.625221
Prob(F-statistic)	0.000031		

*Note: p-values and any subsequent tests do not account for model selection.

Table A2.6: Correlation Matrix

	FDI	**IR**	**GDP_PER_CAPITA_GROWTH Rate**	**PDI**	**INF**	**HC**	**RER_NER**	**RIR**	**TO**
FDI	1	0.76	0.17	0.71	0.04	-0.28	-0.48	-0.45	-0.12
IR	0.76	1	-0.04	0.71	0.09	-0.21	-0.58	-0.39	0.12
GDP_PER_CAPITA_GROWTH Rate	0.17	-0.04	1	0.29	-0.44	0.06	-0.06	0.17	-0.48
PDI	0.71	0.71	0.29	1	0.01	-0.24	-0.85	-0.39	-0.37
INF	0.04	0.09	-0.44	0.01	1	-0.29	-0.18	-0.34	0.46
HC	-0.28	-0.21	0.06	-0.24	-0.29	1	0.33	0.05	-0.26
RER_NER	-0.48	-0.58	-0.06	-0.85	-0.18	0.33	1	0.33	0.17
RIR	-0.45	-0.39	0.17	-0.39	-0.34	0.05	0.33	1	0.18

TO	-0.12	0.12	-0.48	-0.37	0.46	-0.26	0.17	0.18	1

Table A2.7: Breusch-Godfrey Serial Correlation LM Test -1

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.154602	Prob. F(2,30)	0.8574
Obs*R-squared	0.469277	Prob. Chi-Square(2)	0.7909

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 09/15/19 Time: 00:38
Sample: 1972 2017
Included observations: 46
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI__REAL_VALUES_IN_MILL(-1)	-0.013662	0.195529	-0.069874	0.9448
FDI__REAL_VALUES_IN_MILL(-2)	-0.044687	0.187570	-0.238239	0.8133
IR__REAL_VALUES_IN_MILLI	0.007171	0.096729	0.074135	0.9414
IR__REAL_VALUES_IN_MILLI(-1)	0.010801	0.090634	0.119173	0.9059
GDP_PER_CAPITA_GROWTH__A	0.043630	0.391853	0.111343	0.9121
GDP_PER_CAPITA_GROWTH__A(-1)	0.035648	0.317082	0.112426	0.9112
GDP_PER_CAPITA_GROWTH__A(-2)	0.005914	0.221126	0.026745	0.9788
INF	0.006175	0.106905	0.057760	0.9543
INF(-1)	0.003943	0.113131	0.034851	0.9724
INF(-2)	-0.002128	0.094673	-0.022481	0.9822
RER_NER	-0.006291	0.065070	-0.096673	0.9236
PDI__REAL_VALUES_IN_MILL	-0.007338	0.031352	-0.234062	0.8165
PDI__REAL_VALUES_IN_MILL(-1)	0.006178	0.028391	0.217600	0.8292
C	0.438163	6.036795	0.072582	0.9426
RESID(-1)	0.086153	0.270648	0.318321	0.7524
RESID(-2)	0.118560	0.271633	0.436472	0.6656

R-squared	0.010202	Mean dependent var	-5.79E-16
Adjusted R-squared	-0.484697	S.D. dependent var	3.375865
S.E. of regression	4.113429	Akaike info criterion	5.934599
Sum squared resid	507.6090	Schwarz criterion	6.570649
Log likelihood	-120.4958	Hannan-Quinn criter.	6.172867
F-statistic	0.020614	Durbin-Watson stat	1.938629
Prob(F-statistic)	1.000000		

Table A2.8: Breusch-Godfrey Serial Correlation LM Test -2

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.464111	Prob. F(2,35)	0.6325
Obs*R-squared	1.214266	Prob. Chi-Square(2)	0.5449

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 09/15/19 Time: 12:09
Sample: 1971 2017
Included observations: 47
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.

GDP_PER_CAPITA_GROWTH__A(-1)	-0.057342	0.142552	-0.402254	0.6899
IR__REAL_VALUES_IN_MILLI	0.000868	0.069031	0.012568	0.9900
IR__REAL_VALUES_IN_MILLI(-1)	-0.007847	0.052944	-0.148216	0.8830
FDI__REAL_VALUES_IN_MILL	0.005688	0.084842	0.067038	0.9469
PDI__REAL_VALUES_IN_MILL	-0.002612	0.012932	-0.201957	0.8411
PDI__REAL_VALUES_IN_MILL(-1)	0.003425	0.012905	0.265382	0.7923
HC	0.036340	6.765879	0.005371	0.9957
HC(-1)	0.447087	6.686757	0.066861	0.9471
RIR	0.001889	0.071779	0.026312	0.9792
C	-0.201622	1.763202	-0.114350	0.9096
RESID(-1)	0.182938	0.243326	0.751823	0.4572
RESID(-2)	-0.082694	0.224396	-0.368517	0.7147

R-squared	0.025835	Mean dependent var	4.45E-15
Adjusted R-squared	-0.280331	S.D. dependent var	2.427331
S.E. of regression	2.746566	Akaike info criterion	5.074419
Sum squared resid	264.0269	Schwarz criterion	5.546797
Log likelihood	-107.2488	Hannan-Quinn criter.	5.252178
F-statistic	0.084384	Durbin-Watson stat	1.899207
Prob(F-statistic)	0.999941		

Table A2.9: Heteroskedasticity Test: ARCH -1

Heteroskedasticity Test: ARCH

F-statistic	0.040063	Prob. F(1,43)	0.8423
Obs*R-squared	0.041887	Prob. Chi-Square(1)	0.8378

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 09/15/19 Time: 00:39
Sample (adjusted): 1973 2017
Included observations: 45 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.54094	2.517351	4.584559	0.0000
RESID^2(-1)	-0.030606	0.152912	-0.200157	0.8423

R-squared	0.000931	Mean dependent var	11.20445
Adjusted R-squared	-0.022303	S.D. dependent var	12.43145
S.E. of regression	12.56931	Akaike info criterion	7.943821
Sum squared resid	6793.470	Schwarz criterion	8.024117
Log likelihood	-176.7360	Hannan-Quinn criter.	7.973754
F-statistic	0.040063	Durbin-Watson stat	1.974511
Prob(F-statistic)	0.842301		

Table A2.10: Heteroskedasticity Test: ARCH - 2

Heteroskedasticity Test: ARCH

F-statistic	1.662610	Prob. F(3,40)	0.1904
Obs*R-squared	4.878309	Prob. Chi-Square(3)	0.1809

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares

Date: 09/15/19 Time: 12:12
Sample (adjusted): 1974 2017
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.537197	1.133477	2.238419	0.0308
RESID^2(-1)	0.239730	0.148497	1.614380	0.1143
RESID^2(-2)	-0.028040	0.152499	-0.183872	0.8550
RESID^2(-3)	0.081161	0.120111	0.675718	0.5031

R-squared	0.110871	Mean dependent var	3.954115
Adjusted R-squared	0.044186	S.D. dependent var	6.065951
S.E. of regression	5.930422	Akaike info criterion	6.484576
Sum squared resid	1406.796	Schwarz criterion	6.646775
Log likelihood	-138.6607	Hannan-Quinn criter.	6.544727
F-statistic	1.662610	Durbin-Watson stat	2.217491
Prob(F-statistic)	0.190393		

Figure A2.1: Normality Test: Model 1

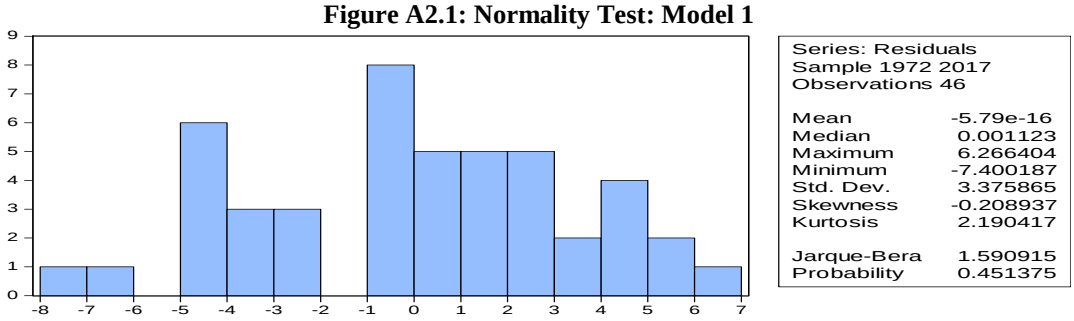


Figure A2.2: Normality Test: Model 2

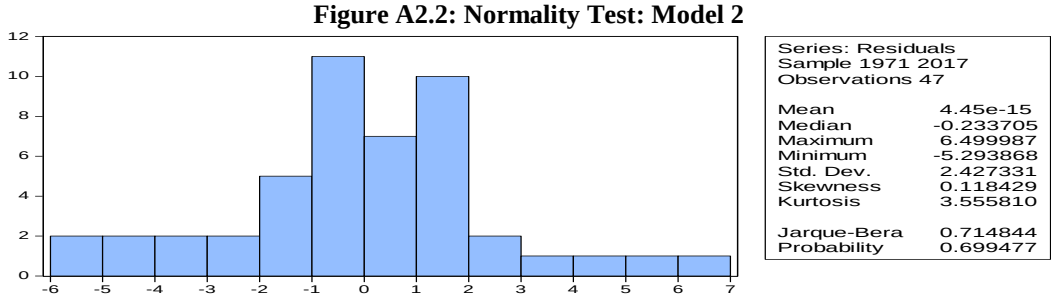


Figure A2.3: Model stability Test: Model 1

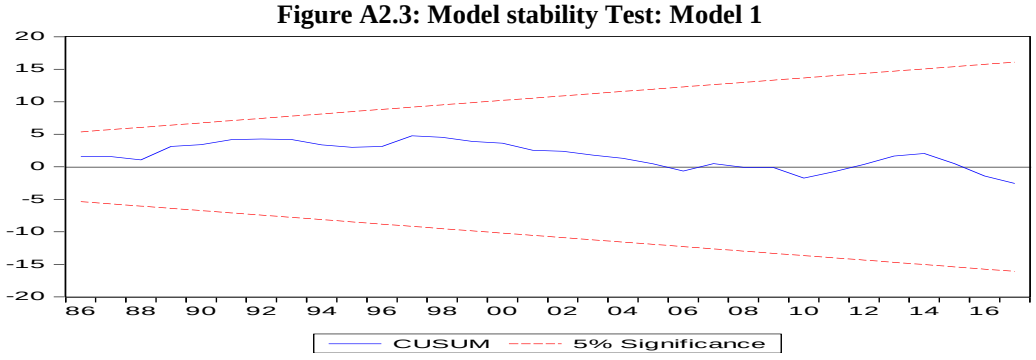


Figure A2.4: Model stability Test: Model 2

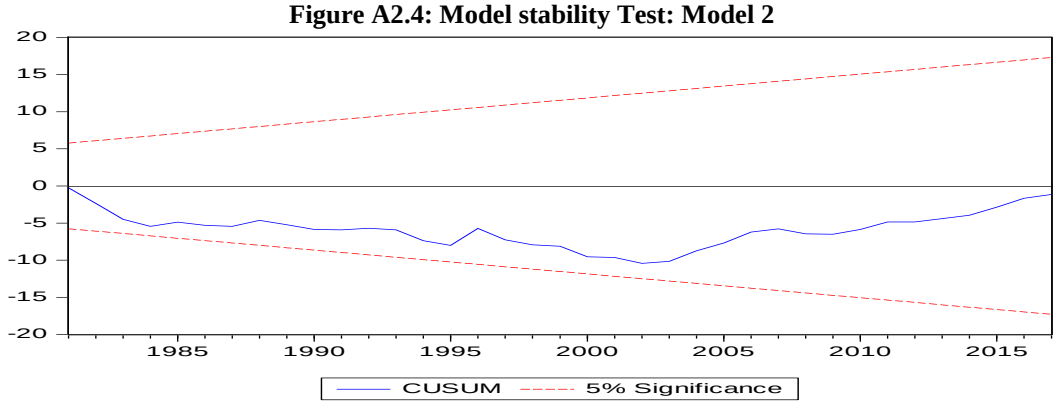


Table A2.11: VAR Output 1

Vector Autoregression Estimates
Date: 09/11/19 Time: 12:50
Sample (adjusted): 1975 2017
Included observations: 43 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	IR__REAL_VALUES_IN_MILLI	FDI__REAL_VALUES_IN_MILL
IR__REAL_VALUES_IN_MILLI(-1)	0.335128	0.292722
	(0.09514)	(0.11255)
	[3.52250]	[2.60084]
IR__REAL_VALUES_IN_MILLI(-2)	0.006529	-0.112917
	(0.12339)	(0.14597)
	[0.05291]	[-0.77355]
IR__REAL_VALUES_IN_MILLI(-3)	-0.300846	-0.172880
	(0.11286)	(0.13351)
	[-2.66562]	[-1.29484]
IR__REAL_VALUES_IN_MILLI(-4)	-0.003378	0.258153
	(0.11343)	(0.13419)
	[-0.02978]	[1.92377]
IR__REAL_VALUES_IN_MILLI(-5)	-0.314271	-0.227743
	(0.07708)	(0.09118)
	[-4.07724]	[-2.49761]
FDI__REAL_VALUES_IN_MILL(-1)	0.217527	0.106585
	(0.14262)	(0.16872)
	[1.52524]	[0.63174]
FDI__REAL_VALUES_IN_MILL(-2)	-0.366173	-0.280598
	(0.14964)	(0.17702)
	[-2.44706]	[-1.58512]
FDI__REAL_VALUES_IN_MILL(-3)	0.406105	0.400502
	(0.13769)	(0.16288)
	[2.94944]	[2.45881]
FDI__REAL_VALUES_IN_MILL(-4)	0.305025	-0.023085
	(0.14297)	(0.16914)
	[2.13342]	[-0.13649]
FDI__REAL_VALUES_IN_MILL(-5)	0.335823	-0.053827
	(0.14134)	(0.16720)
	[2.37601]	[-0.32193]
INF	-0.187704	-0.046968
	(0.12644)	(0.14957)
	[-1.48456]	[-0.31401]
RIR	-0.092432	-0.058920
	(0.14043)	(0.16613)
	[-0.65821]	[-0.35467]

TO	6.402574	2.465977
	(3.58526)	(4.24133)
	[1.78581]	[0.58142]
RER_NER	-0.085491	0.009313
	(0.02922)	(0.03456)
	[-2.92627]	[0.26946]
GDP_PER_CAPITA_GROWTH__A	-0.648058	0.091948
	(0.39861)	(0.47155)
	[-1.62580]	[0.19499]
PDI__REAL_VALUES_IN_MILL	0.081260	0.021882
	(0.01060)	(0.01254)
	[7.66350]	[1.74443]
R-squared	0.977396	0.814751
Adj. R-squared	0.964837	0.711834
Sum sq. resids	400.5747	560.5927
S.E. equation	3.851766	4.556610
F-statistic	77.83017	7.916635
Log likelihood	-108.9959	-116.2219
Akaike AIC	5.813763	6.149858
Schwarz SC	6.469094	6.805188
Mean dependent	13.87534	6.685776
S.D. dependent	20.54091	8.488301
Determinant resid covariance (dof adj.)		235.1860
Determinant resid covariance		92.72610
Log likelihood		-219.4162
Akaike information criterion		11.69378
Schwarz criterion		13.00444

Table A2.12: VAR Output 2

Vector Autoregression Estimates
Date: 09/11/19 Time: 13:07
Sample (adjusted): 1973 2017
Included observations: 45 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	IR__REAL_VALUES_IN_MILLI	GDP_PER_CAPITA_GROWTH__A
IR__REAL_VALUES_IN_MILLI(-2)	0.271269	0.099454
	(0.15283)	(0.04018)
	[1.77499]	[2.47517]
IR__REAL_VALUES_IN_MILLI(-3)	-0.201968	-0.079569
	(0.12953)	(0.03406)
	[-1.55921]	[-2.33643]
GDP_PER_CAPITA_GROWTH__A(-2)	-2.262278	0.054899
	(0.43915)	(0.11546)
	[-5.15153]	[0.47549]
GDP_PER_CAPITA_GROWTH__A(-3)	0.130549	-0.058695
	(0.28882)	(0.07593)
	[0.45202]	[-0.77298]
INF	-0.155727	-0.140547
	(0.19873)	(0.05225)
	[-0.78362]	[-2.68998]
RIR	-0.199617	-0.075955
	(0.21605)	(0.05680)
	[-0.92396]	[-1.33720]
TO	0.489985	0.676964
	(7.04820)	(1.85307)
	[0.06952]	[0.36532]
RER_NER	-0.013150	0.036034
	(0.04014)	(0.01055)
	[-0.32758]	[3.41428]

FDI__REAL_VALUES_IN_MILL	0.827476	0.010585
	(0.22433)	(0.05898)
	[3.68861]	[0.17946]
PDI__REAL_VALUES_IN_MILL	0.069430	0.002910
	(0.01290)	(0.00339)
	[5.38305]	[0.85826]
R-squared	0.904473	0.537174
Adj. R-squared	0.879909	0.418162
Sum sq. resids	1727.986	119.4451
S.E. equation	7.026452	1.847354
F-statistic	36.82090	4.513597
Log likelihood	-145.9333	-85.81661
Akaike AIC	6.930371	4.258516
Schwarz SC	7.331851	4.659996
Mean dependent	13.25866	0.861683
S.D. dependent	20.27591	2.421860
Determinant resid covariance (dof adj.)	153.1182	
Determinant resid covariance	92.62706	
Log likelihood	-229.5975	
Akaike information criterion	11.09322	
Schwarz criterion	11.89619	

Table A2.13: VAR Residual Serial Correlation 1

VAR Residual Serial Correlation LM Tests
Null Hypothesis: no serial correlation at lag order h
Date: 09/11/19 Time: 12:57
Sample: 1970 2017
Included observations: 43

Lags	LM-Stat	Prob
1	1.897853	0.7545
2	3.052341	0.5491
3	5.402000	0.2485
4	2.995977	0.5585
5	0.728776	0.9477
6	3.696543	0.4486

Probs from chi-square with 4 df.

Table A2.14: VAR Residual Serial Correlation 2

VAR Residual Serial Correlation LM Tests
Null Hypothesis: no serial correlation at lag order h
Date: 09/11/19 Time: 13:12
Sample: 1970 2017
Included observations: 45

Lags	LM-Stat	Prob
1	3.909404	0.4184
2	6.359420	0.1739
3	1.785224	0.7752

Probs from chi-square with 4 df.

Table A2.15: VAR Residual Heteroskedasticity Tests 1

VAR Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)
Date: 09/11/19 Time: 13:21
Sample: 1970 2017
Included observations: 43

Joint test:

Chi-sq	df	Prob.
103.2698	96	0.2878

Individual components:

Dependent	R-squared	F(32,10)	Prob.	Chi-sq(32)	Prob.
res1*res1	0.913600	3.304409	0.0248	39.28481	0.1758
res2*res2	0.733275	0.859118	0.6504	31.53082	0.4902
res2*res1	0.837480	1.610343	0.2154	36.01165	0.2862

Table A2.16: VAR Residual Heteroskedasticity Tests 2

VAR Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)
Date: 09/11/19 Time: 13:14
Sample: 1970 2017
Included observations: 45

Joint test:

Chi-sq	df	Prob.
68.96592	60	0.2001

Individual components:

Dependent	R-squared	F(20,24)	Prob.	Chi-sq(20)	Prob.
res1*res1	0.772356	4.071387	0.0007	34.75602	0.0214
res2*res2	0.449370	0.979324	0.5140	20.22167	0.4441
res2*res1	0.413954	0.847621	0.6434	18.62793	0.5461

Figure A2.5: Inverse Root Test 1

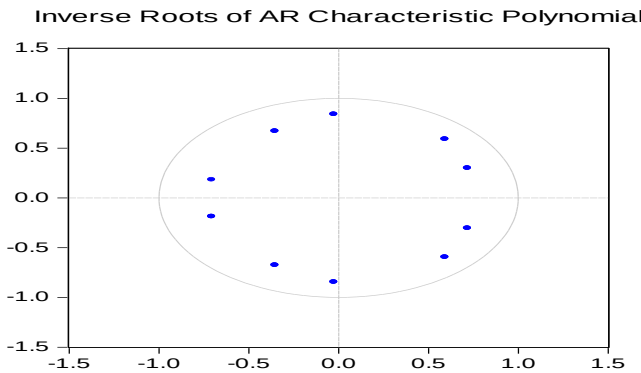
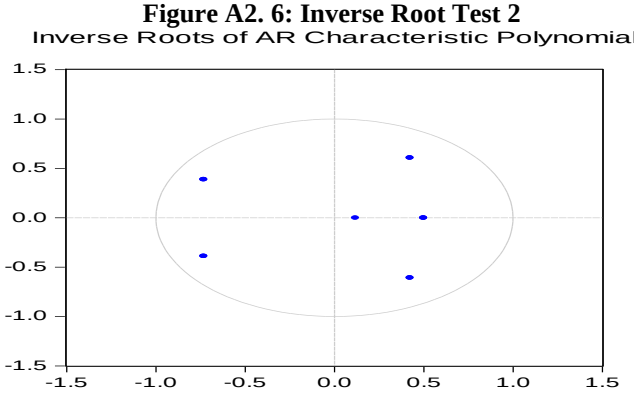


Figure A2. 6: Inverse Root Test 2



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