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FOREIGN DIRECT INVESTMENTS AND ITS EFFECTS ON INTERNATIONAL TRADE IN KENYA

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Abstract

The contribution of FDI to the development of a country is universally acknowledged as it bridges the gap between a country's desired investments and the domestically mobilized savings. Since independence, Kenya has designed and implemented two major policy initiatives (of Import Substitution Industrialization and Export Promotion) with a view of attracting FDI and promoting a favorable trade outcome. Although a number of studies on FDI inflows into Kenya have been undertaken, they have yet to establish the benefits Kenya has derived from the two major policy initiatives that aimed at attracting FDI and promoting trade. This is what triggered the need for this study, which sought to determine effects of FDI on trade in Kenya. The overall objective of the study was to examine the effects of FDI on international trade in Kenya. The specific objectives of the study were to determine the effect of trade policy reforms on FDI inflows in Kenya, determine the effects of FDI on exports in Kenya and determine the effects of FDI on imports. To achieve the first objective, a dummy variable was created to represent policy reforms and included in the export and import equations as independent variables. All the three objectives were achieved through estimating the coefficients of the independent variables against the respective dependent variables using Vector Error Correction Model (VECM). The study found that foreign direct investment inflows in Kenya lead to increase in both exports and imports. However, the rate of

growth of imports was faster during the export promotion period compared to the import substitution period despite the expected result of a reduction in imports. It further reveals that exports were also determined by gross domestic product, population, and exchange rate whereas imports were determined by gross national income, population, and exchange rate.

Keywords: *Foreign Direct Investments (FDI), International trade*

1.0 Introduction

1.1 Background of the Study

Contribution of Foreign Direct Investment (FDI) to the development of a country is widely recognized in filling the gap between desired investments, creation of jobs, economic growth, increase in tax revenues in host countries. Most foreign direct investment in developing countries are trade-driven where trade plays this role through linkages with other sectors of the economy by creating markets through which goods and services reach the consumers (KIPPRA, 2013).

Several trade policies have been implemented by the Kenyan Government since independence aimed at attracting FDI for increased local production and consequently promotion of international trade. They include Import Substitution Industrialization (ISI) policy from the mid-1960s to 1980s which was enunciated in *Sessional Paper No. 10 of 1965* with the aim of reducing the excessive dependence on primary production, replacing previously imported goods with domestic production in order to relieve the balance of payments (Republic of Kenya, 1965). Much as *Sessional Paper No. 10 of 1965* policy reforms led to FDI inflows that contributed to the establishment of many import substituting industries, the perverse import of inputs appears to have diluted the policy's overall effect of reducing imports. This is notwithstanding the fact that the manufacturing industries set up during this period laid the foundation for Kenya's exports of manufactured products to the EAC and later COMESA (Were, *et al.,* 2009).

Despite the above policy reforms, the desired results were not achieved as ISI strategy became untenable by the early 1980s, which necessitated a change in policy, leading to trade reforms. The government adopted Structural Adjustment Programmes (SAPs) reforms promoted by the Bretton woods institutions [World Bank and International Monetary Fund (IMF)] in the early 1980s with the conditions for provision of loans and other support. SAPs were designed to encourage the structural adjustment of an economy by removing "excess" government controls and promoting market competition as part of the neo-liberal Washington consensus agenda with an overall objective of shifting from a highly protected import substitution economy to export promotion policies (Were *et al.,* 2009). *Sessional Paper No.1 of 1986* (Republic of Kenya, 1986) was thereafter introduced as a demonstration of government's commitment to the reform process. With this policy, the government committed itself to liberalize the economy and adopt an outward-looking development strategy marking the beginning of the trade liberalization period, which, like the ISI period also encouraged FDI inflows (Were *et al.,* 2009).

Further, the post 1986 policy reforms led to FDI inflows that contributed to the establishment of the EPZs large-scale horticultural production and the AGOA initiative. However, manufacturing under EPZs encouraged importation of raw materials for textile and garment production, while trade liberalisation encouraged importation of second hand clothes. It would appear that the policy reforms that encouraged FDI inflows into Kenya do not seem to have yielded the intended results. The period when Kenya recorded the highest FDI inflows (2007-2015) is the period when the rate of growth of imports far outstripped that of exports, resulting in

serious balance of trade deficits. Thus, it is important to inquire into this paradox where FDI inflows yield results contrary to what is expected [Glenday and Ndii, 2000; Exports Processing Zones Authority (EPZA), 2005]. In theory, increased FDI inflows would lead to more exports and reduced balance of trade but in Kenya this has not been the case, prompting the need to establish the relationship of FDI and its effects on international trade. The African Growth and Opportunity Act (AGOA) of the United States in 2000 aimed at improving trade balance between the USA and Kenya through increase in exports and reduction of imports. It gave new impetus to EPZs exports by providing Kenya's exports duty and quota free access to the United States. AGOA ensured that Kenya enjoyed preferential access to the United States markets (KEPZA, 2013).

1.1.1 Foreign Direct Investment and International Trade Trends in Kenya

Kenya was one of the most favored destinations for FDI in East Africa in the 1970s as it had a relatively high level of economic development, good infrastructure, more open to private business and larger regional market than the other original EAC members. During this period Kenya recorded above average economic growth and openness to FDI at a time when other countries in the region had relatively closed economic regimes, politically unstable and insecure, all of which contributed to the multinational companies (MNCs) choosing Kenya as their regional hub (Ikiara, 2003).

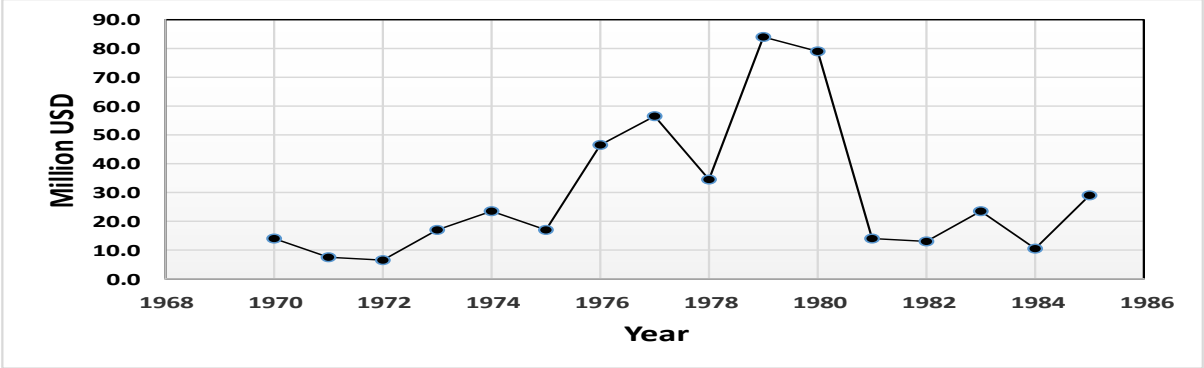

Figure 1: Kenya Inflows FDI 1970-1985 during ISI period

Source of data: International Monetary Fund (2017)

Figure 1 shows FDI increased gradually but dropped in 1977 which is attributable to the collapse of the EAC whereby FDI decreased from USD 56.55 in 1977 to USD 34.41 in 1978. Then it shot up to USD 84.01 and USD 78.9 in 1979 and 1980 respectively. It then dropped to USD 14.15 in 1981 and fluctuated thereafter up to 1985.

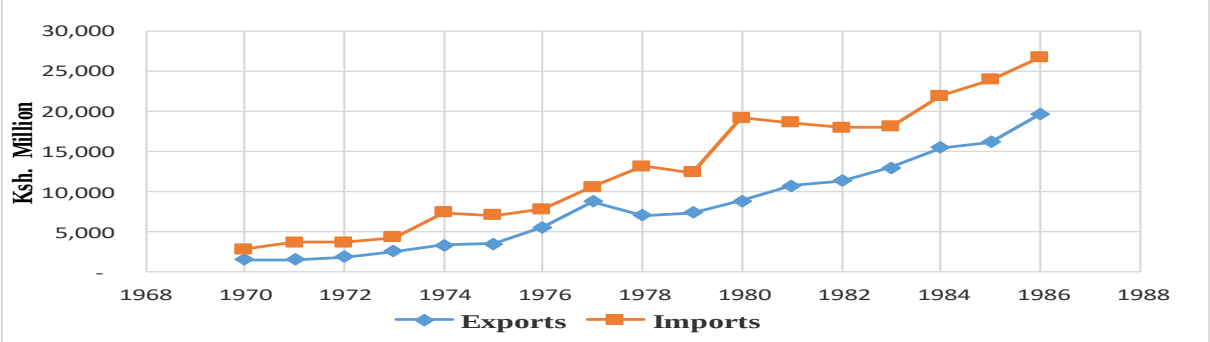

Figure 2: Kenya Exports and Imports 1970 – 1985 during ISI period

Source of data: KNBS (Statistical Abstracts) (2017)

Figure 2 shows that from 1970, there was an upward growth in both imports and exports. Exports increased gradually until 1977 where they dropped from Ksh. 8,800 million in 1977 to Ksh. 7,090 million in 1978. On the other hand, imports increased from Ksh. 10,585 million to Ksh. 13,176 million in 1977 to 1978 respectively. The Iran/Iraq war, which raised crude oil prices and the dry weather conditions during 1980-1984 period necessitated paying a higher import bill for petroleum products and food imports. This means that the overall objective of reducing importation of finished goods was not achieved.

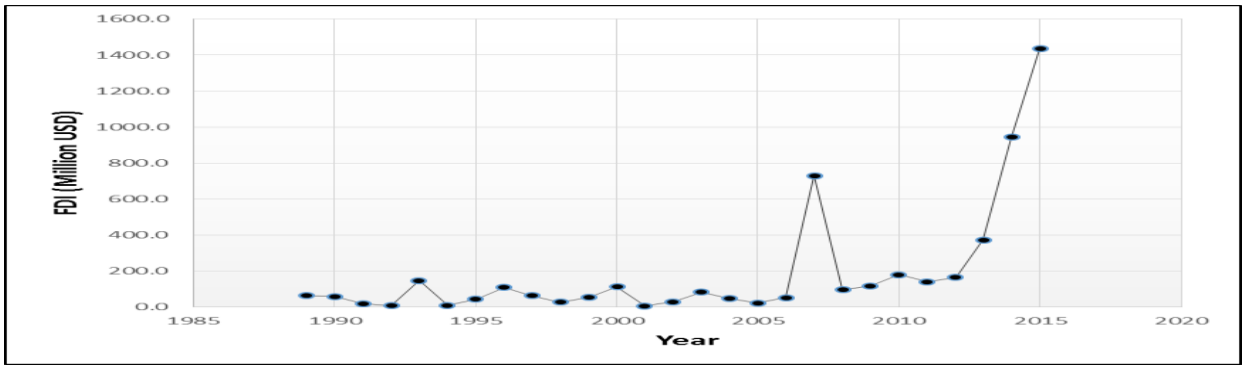

Figure 3: Kenya FDI 1986 – 2015 during export promotion period

Source of data: International Monetary Fund (2017)

Figure 3 shows that from 1989 to 2005 there was a trickle of FDI into Kenya, which suddenly shot up in 2006 but plunged back in 2008 due to the post-election violence. Recovery was recorded from 2013. During this period FDI inflows increased from USD 6.3 million in 1992 to USD 145.6 million in 1993, but dropped back to USD 7.4 million in 1994. The FDI inflows continued to fluctuate until 2007 when it shot up to a new peak of USD 729 million, but dropped to USD 95.5 million the following year. The drop in FDI inflows in 2008, attributed to post election violence, resumed growth in 2009 reaching a high of USD 944.32 million and USD 1,437 million in 2014 and 2015 respectively.

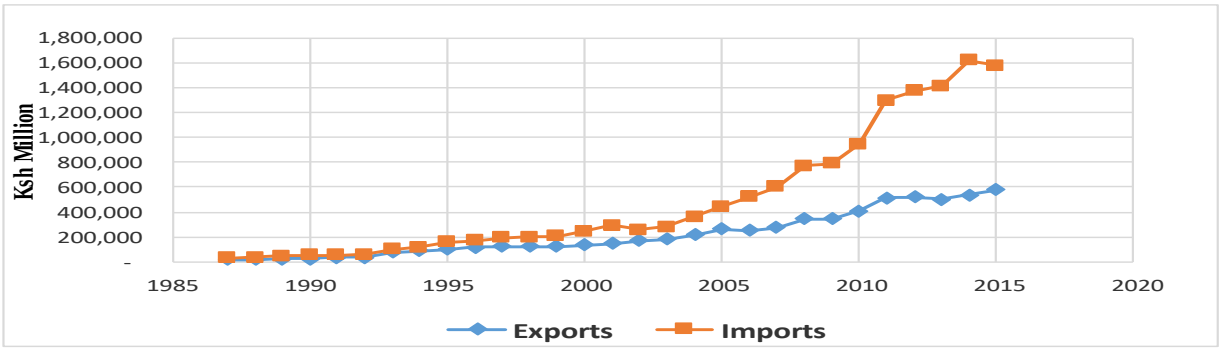

Figure 4: Kenya Exports and Imports 1986 – 2015 during export promotion period

Source of data: KNBS (Statistical Abstracts) (2017)

Figure 4 shows that during the same period 1986 – 2015 imports and exports grew gradually from the mid-1990s following the stronger implementation of liberalization programs of the Structural Adjustment Programmes (SAPs) of 1980s. Both exports and imports grew gradually with exports rising from Ksh. 15.7 billion in 1987 to Ksh. 97.3 billion in 1995 and imports rising from Ksh. 28.6 billion in 1987 to Ksh. 155.2 billion in 1995 respectively. Free floating of exchange rate from 1996 led to tremendous growth from as low of Ksh. 118.2

billion of exports and Ksh. 168.5 billion of imports in 1996 to as high as Ksh. 581.0 billion and Ksh. 1,577.6 billion of exports and imports respectively in 2015 (KNBS, 2016).

2.0 Theoretical Framework

Several empirical studies reviewed revealed that there exist a significant and positive relationship between FDI and exports and between FDI and imports. Vernon (1966) Product Life Cycle (PLC) theory informed this study as it explains the relationship between FDI and trade. The study further adopted Schive and Tu (1991) model to estimate the effect of FDI on trade (imports and exports). Since most FDI investments in host countries initially depend on imported inputs (capital, technology, skilled labour, and raw materials), the following Abe (1983) equation applied in the short run:

$$M_t^s = \beta_0 + \beta_1 FI_t^s + u_t \quad \text{.....} \quad 1$$

Where,

M_t^s = Imports from a home country (foreign) at time t;

FI_t^s = FDI inflows from home country at time t.

In the long run, once FDI has set base in the host country, the trade model of Schive and Tu (1991) applied with a slight modification to accommodate population since the rapid growth of Kenya's population entails increased domestic consumption of domestically produced products that reduces the surplus for exports.

3.0 Literature Review

3.1 Empirical Literature

A number of empirical studies on FDI in Kenya have focused on aspects such as relationship between FDI and economic growth (Muchira 2013, Abala, 2014); and determinants of FDI (Mahiti, 2012). From the reviewed literature, there still exists a knowledge gap on the FDI and its effects of FDI on international trade in Kenya which the study addresses. Cetin and Altintas (2006) pointed out that from the 1980s, econometric models were developed to analyse long-run relationship between inward FDI flows and trade in host developing countries. One of the studies Cetin and Altintas (2006) reviewed was that of Abe (1983) which used econometric tools of analysis. The Abe (1983) model tested the Kojima (1973, 1975, and 1982) hypothesis that Japanese FDIs in developing Asian countries is more trade-oriented than USA FDIs to the same countries. In the Abe (1983) model, current imports were modelled only as a function of current FDI inflows. The equations were estimated using OLS in a logarithmic form. The estimated results of Abe (1983) model were consistent with the Kojima hypothesis.

Kojima (1985) study set out to test the validity of his hypothesis (that Japanese FDIs in Asia were more export-oriented than USA FDIs) on the four Asian countries of South Korea, Philipines, Taiwan and Thailand for the period 1967 – 1982. Current exports and imports were modelled only as a function of FDI inflows. The Kojima (1985) models were estimated using OLS in a logarithmic form. The estimated results showed that, except for USA FDI in South Korea and Thailand, the coefficient of Japanese and USA FDI were statistically significant.

Schive and Tu (1991) developed aggregate export-import models to investigate the effect of FDI on trade performance of Taiwan for the period 1958-1987. In their model, exports were determined by world income, relative export price, FDI stock, and one-year lagged export, while imports were determined by GDP of Taiwan,

real exchange rates, FDI stock and one-year lagged imports. The trade models were estimated by Three Stage Least Square (3SLS) method, with the results showing that FDI stock was a positive and significant determinant of Taiwan's exports, while it (FDI) had an insignificant effect on Taiwan's imports during the period of study.

In Kenya several studies have been conducted on FDI determinants. These studies include Kinaro (2006) that used Error Correlation Model (ECM) to analyse time series data which showed that FDI in Kenya is determined by economic openness, human capital, real exchange rate, inflation, and FDI in the previous periods. Mwega and Mahiti (2012) investigated determinants of Foreign Direct Investments (FDIs) in Tanzania and Kenya. The study revealed that most of the investors were attracted to invest in Kenya because of promotion activities, provision of investment incentives, and reforms on investment policies. Muchira (2013) examined the effect of foreign direct investments on economic growth in Kenya. The study sampled a period of 10 years starting from 2003 to 2012. The quantitative data collected was analysed by the use of descriptive statistics and multiple regressions. It found that there exists a positive relationship between foreign direct investment and economic growth in Kenya. Abala (2014) investigated the empirical relationship between Foreign Direct Investment and economic growth in Kenya. The study established that a high real GDP has a positive influence on the FDI. It further established that human capital, government expenditure and openness of the economy are vital for the growth of the economy. Other drivers of FDI were the real GDP growth, levels of indebtedness, market size, political stability and infrastructural facilities.

3.2 Theoretical Literature

Theoretical literature reveals there is no unified theoretical explanation behind FDI. Nevertheless, Vernon (1966) Product Life Cycle (PLC) theory forms the basis of this study since exporting, importing and manufacturing location changes over time.

Heckscher-Ohlin-Samuelson (H-O-S model) posits that international trade could substitute for mobility of factors of production internationally (including FDI) and further suggests that international commodity's trade involves an indirect exchange of factors of production between countries. H-O-S model assumes that the main factor for international trade are the relative factor endowment differences (Liu, Wang and Wey, 2001). Mundell (1957) points out that a tariff protection would cause a perfect substitution between FDI and trade. He further argues that international trade and international movement of factors of production that includes FDI are substitutes and not compliments for each other where there exist barriers of trade. Trade barriers stimulate factor movements and that increased obstacles to factor movements stimulate trade. Mundell's model could therefore not clearly explain international production through FDI, as the foreign investment in Mundell's model were portfolio investment or short term investment.

Proponents of Internalization Theory developed by Buckley and Casson in 1976 and then improved by Hennart, in 1982 argue that FD1 modes of expansion are better since the risk of dissemination of information monopoly is less when firms expand using these modes. The theory explains the growth of transnational companies and their inspirations to achieving foreign direct investment. Buckley and Casson (1976) demonstrated that the transnational companies organize their internal activities in order to come up with specific advantages, which are exploited. Hennart (1982) on the other hand developed the idea of internalization by developing models between the two types of integration which are the vertical and horizontal. He argued that FDI can only take place if the benefits of exploiting internal activities of a firm outweigh relative costs of the operations abroad.

Eclectic Paradigm Theory proposed by Dunning (1977 and 1979) combined the major imperfect market based theories and added a third dimension in form of location theory in explaining the reason behind a firm opening a

foreign subsidiary. Dunning argues that a firm would engage in foreign direct investment if three conditions are fulfilled namely, ownership advantages, location advantages and internalization (OLI).

Product Life Cycle (PLC) theory was developed by Raymond Vernon in 1966 explains both trade and foreign direct investments (FDI). Vernon contended that FDI was the reaction to the threat of losing markets as products matured as well as the need for cheaper factor costs in the face of competition (Latorre, 2008). According to the theory, the same firms that initiate a product for consumption in home markets eventually undertakes FDI to produce a product for consumption in a foreign market. The theory explains how a product may emerge as a country's export and work through the life cycle to ultimately become an import. Developing countries import these goods from the respective producing advanced country/countries during the first two stages of production. As exports decline, the innovator firms start locating production facilities in developing countries by taking advantage of cheap labour costs and/or to break market entry barriers so as to meet the local demand and also to export back to developed countries. Thus, the exporter becomes an importer at this stage of production.

3.3 Statement of the problem

The critical roles played by FDI such as promotion of exports and reduction of imports led Kenyan government to design policy measures such as *Sessional Paper No. 10 of 1965* and *No.1 of 1986* to facilitate the access to and attraction of new foreign capital.

Much as *Sessional Paper No. 10 of 1965* policy reforms led to FDI inflows that contributed to the establishment of many import substituting industries, the perverse import of inputs appears to have diluted the policy's overall effect of reducing imports. This is notwithstanding the fact that the manufacturing industries set up during this period laid the foundation for Kenya's exports of manufactured products to the EAC and later COMESA. Further, the post 1986 policy reforms led to FDI inflows that contributed to the establishment of the EPZs large-scale horticultural production and the AGOA initiative. However, manufacturing under EPZs encouraged importation of raw materials for textile and garment production, while trade liberalisation encouraged importation of second hand clothes. It would appear that the policy reforms that encouraged FDI inflows into Kenya do not seem to have yielded the intended results. The period when Kenya recorded the highest FDI inflows (2007-2015) is the period when the rate of growth of imports far outstripped that of exports, resulting in serious balance of trade deficits. Thus, it is important to inquire into this paradox where FDI inflows yield results contrary to what is expected. In theory, increased FDI inflows would lead to more exports and reduced balance of trade but in Kenya this has not been the case, prompting the need to establish the relationship of FDI and its effects on international trade.

3.4 Purposes of the Study

The study findings adds knowledge on the effects Foreign Direct Investments on international trade in Kenya. The results of the study will serves as a guide to policy makers in designing appropriate policies on attracting FDI. The findings are also useful to academicians, foreign investors and other stakeholders interested in effects of FDI and international trade.

3.5 Objectives of the Study

The overall objective of this study was to examine the effect of foreign direct investment on international trade in Kenya. The specific objectives of the study were:

i. Determine the effect of FDI on exports in Kenya.
ii. Determine the effect of FDI on imports in Kenya.

3.6 Research Questions

i. What is the effect of FDI on exports in Kenya?
ii. What is the effect of FDI on imports in Kenya?

4.0 Research Methodology

Design of Study

The study adopted non-experimental research design which entails collecting time series data for the period 1970 to 2015 for use in both the descriptive and regression analyses. This allowed the researcher to purely act as an observer without controlling, manipulating, or altering the predictor variables (Cola`mesta & Pistelli, 2014).

Population of Study

The study utilized secondary data for the period between 1970 and 2015 which gave 45 observations. The annual data for imports, exports and foreign direct investment was collected. The data on FDI was obtained from International Monetary Fund (IMF) financial statistics, whereas exports, imports and population data were sourced from the Kenya National Bureau of Statistics (KNBS).

Data Analysis

The data collected was analysed by regression analysis with the aim of achieving the objectives of the study. The linear models were estimated using the Vector Error Correction Model (VECM). VECM model was adopted in this study to examine the effects of foreign direct investment on international trade. The general form of VECM is presented as follows:

$$\Delta Y_t = \sum_{i=1}^{k=1} \Gamma_i Y_{t-1} + \prod Y_{t-1} + \mu_0 + \varepsilon_t \quad \text{……...} \quad 2$$

Where $\Gamma_i = -\sum_{j=i+1}^{k} A_j$ and $\prod = \sum_{i=1}^{k} A - 1$

There exist *n x r* matrices and β and α each with rank r such that $\prod = \alpha\beta'$ and $\beta' Y_t$ is stationary. This is possible in cases where the reduced rank r < n and r is the number of cointegrating relationships, α are the VECM adjustment parameters and β represents each of the cointegrating vectors. In this study, after establishing cointegration, the VECM model in general form as presented in equation 2 was now the VECM model for equations to be estimated as follows:

$$\Delta X_t = \alpha_0 + \alpha_1 \Delta LnFDI_t + \alpha_2 \Delta LnGDP_t + \alpha_3 \Delta LnINF_t + \alpha_4 \Delta LnPN_t + \alpha_5 \Delta LnER_t + \alpha_6 PL + \alpha_7 ECT_t + \varepsilon_t \quad \text{…3}$$

$$\Delta M_t = \beta_0 + \beta_1 \Delta LnFDI_t + \beta_2 \Delta LnGNI_t + \beta_3 \Delta LnINF_t + \beta_4 \Delta LnPN_t + \beta_5 \Delta LnER_t + \beta_6 PL + \beta_7 ECT_t + \varepsilon_t \quad \text{….4}$$

Where ECT_t is the error correction term which is a measure of the rate of adjustment to the long-run equilibrium and is obtained from the cointegrating vector and results from the shock in the international trade. The error term

is ε_t. $LnFDI_t$ is the logged foreign direct investment, $LnGDP_t$ is the logged GDP, $LnINF$ is the logged inflation, $LnPN_t$ is the logged population, $LnER_t$ is the logged exchange rate, $LnGNI_t$ is the logged gross national income, and PL is the dummy variable representing policy reforms. Equations 3 and 4 were used to achieve the objectives of study.

4.1 Empirical model specification and estimation

The study adopted non-experimental research design. The empirical model was specified as follows:

$$X_t = \alpha_0 + \alpha_1 FDI_t + \alpha_2 GDP_t + \alpha_3 INF_t + \alpha_4 PN_t + \alpha_5 ER_t + \mu_t \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad 5$$

$$M_t = \beta_0 + \beta_1 FDI_t + \beta_2 GNI_t + \beta_3 INF_t + \beta_4 PN_t + \beta_5 ER_t + u_t \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad 6$$

Where,

X_t = Kenya's exports

M_t = Kenya's imports

GNI_t = Kenya's Gross National Income;

INF_t = Inflation;

GDP_t = Kenya's GDP;

ER_t = Nominal exchange rates in Kenya;

PN_t = Kenya's Population

FI_t = Kenya's FDI stock.

As was the case with Schive and Tu (1991), the model was expected to show a linear relationship between FDI and trade in Kenya.

The study utilized secondary data for the period between 1970 and 2015 which gave 46 observations. The annual data for imports, exports and foreign direct investment was collected. The data on FDI was obtained from International Monetary Fund (IMF) financial statistics, whereas exports, imports and population data were sourced from the Kenya National Bureau of Statistics (KNBS). The linear models were estimated using the Vector Error Correction Model (VECM).

4.2 Diagnostic tests undertaken

Diagnostic tests were conducted to ensure that the vector error correction model (VECM) was appropriate to use. This entailed testing the VECM model for serial correlation, heteroscedasticity, normality and stability. The study's two equation models 5 (export equation) and 6 (import equation) that were to be estimated were tested for appropriateness. The study adopted Breusch-Godfrey Serial Correlation LM test in testing the presence of serial correlation with a null hypothesis that there was no serial correlation. The null hypothesis of no serial correlation was rejected at levels because the p-value of R-squared (0.0047 for exports equation and 0.0380 for imports equation) were less than 0.05 level of significance. However, at first difference, both exports and imports equations had the p-values of R-squared as 0.255 and 0.0652 respectively, which were greater than 0.05 level of significance, meaning that the null hypothesis of no serial correlation were not rejected at first difference.

The second diagnostic test done was heteroscedasticity where Breusch-Pegan-Godfrey test was used. The test's null hypothesis was that there was no heteroscedasticity and was tested at 5% or 0.05 level of significance. After the first difference, the null hypothesis of no heteroscedasticity was not rejected because the p-values of R-squared for exports equation 5 and imports equation 6 were 0.6215 and 0.0701, respectively, which were greater than 0.05 level of significance. This meant absence heteroscedasticity in both the export equation and import equation, and the conclusion was that the residual variances for both models were constant.

The third diagnostic test was that of normality for the two equations to be estimated. The VECM method of estimation requires that the error or residuals in a model should be normally distributed. The error term of the exports equation was normally distributed with p-value of Jarque-Bera test at 0.08, which was greater than 5% level of significance. The null hypothesis of normal distributed could not be rejected. The exports model was therefore fit to be estimated using the VECM method. Jarque-Bera p-value of 0.06, which is greater than 0.05 level of significance, the null hypothesis that the error term of the imports equation was normally distributed could not be rejected. This meant the variance of the error term was constant and the assumption of VECM regression was met.

The fourth diagnostic test was the test of stability of the parameters in the model which was done using CUSUM test. The CUSUM test is based on the cumulative sum of recursive residuals, which are plotted together with the 5% critical line. Figure 5 for equation 5 and Figure 6 for equation 6 show the CUSUM test results.

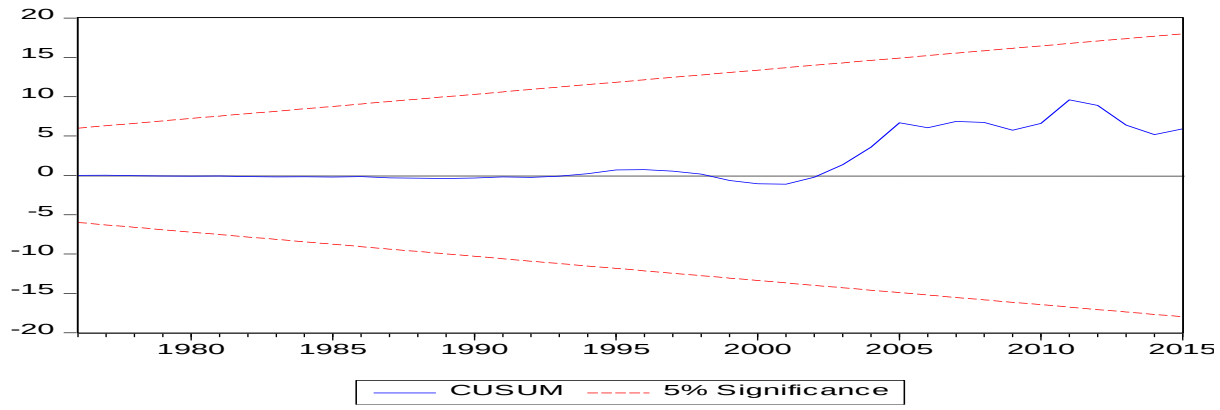

Figure 5: CUSUM Test Results: Exports Equation

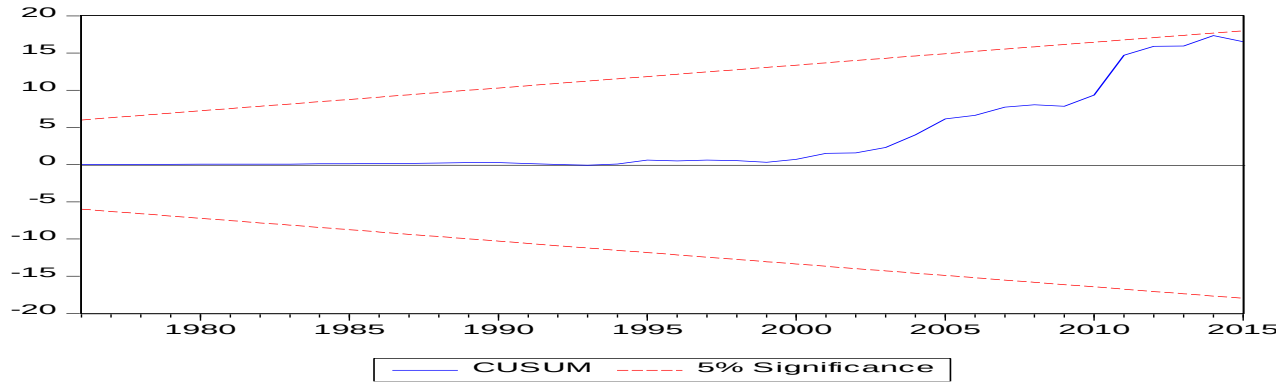

Figure 6: CUSUM Test Results: Imports Equation

The CUSUM test results for exports equation in Figure 5 and for imports equation in Figure 6 show that the parameters were stable because the CUSUM line falls between the two 5% critical lines. The model was therefore stable and fit for use in the VECM method. All the four diagnostic tests indicated that the VECM method was suitable for regression analysis.

5.0 Study Findings/Results

The main objective of the study was to determine the effects of foreign direct investment on international trade in Kenya. The international trade has two major components; imports and exports. In this case the effect of foreign direct investment on imports and on exports was examined separately. To achieve the first objective, export as a dependent variable was regressed against independent variables foreign direct investment, policy reform, gross domestic product, inflation, population, and exchange rate. To achieve the second objective, imports as a dependent variable was also regressed against independent variable foreign direct investment, policy reform, gross national income, inflation, population, and exchange rate. All the tests were done at 5% level of significance.

Table 1: VECM for Exports Model

Dependent Variable: D(EXPORTS)

Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT(-1)	-0.695063**	0.336775	-2.063879	0.0302
D(FDI(-1))	0.177531*	0.083920	2.115479	0.0515
D(FDI(-2))	0.138835**	0.054785	2.534179	0.0229
D(FDI_POLICY(-1))	0.108552	0.232577	0.466736	0.6474
D(FDI_POLICY(-2))	0.100928	0.228554	0.441594	0.6651
D(GDP(-1))	0.516996**	0.194772	2.654365	0.0228
D(GDP(-2))	-0.043127**	0.690593	-0.062449	0.0195
D(INFLATION(-1))	-0.141397	0.091263	-1.549335	0.1421
D(INFLATION(-2))	-0.087951	0.056415	-1.559000	0.1398
D(POPULATION(-1))	-2315.699***	741.0587	-3.124852	0.0070
D(POPULATION(-2))	3854.099***	1200.220	3.211160	0.0058
D(ER(-1))	1.552957**	0.731770	2.122193	0.0279
D(ER(-2))	0.788531**	0.282842	2.787885	0.0143
CONSTANT	11.62912	4.878835	2.383585	0.0308
R-squared	0.819721	Mean dependent var		0.128990
F-statistic**	2.623240	Durbin-Watson stat		2.472988
Prob(F-statistic)	0.027415			

***** implies significance at 1% level; ** implies significance at 5% level; * implies significance at 10% level**

Source: Author's Computation

From Table 1, F-statistics is 2.623240 and statistically significant at 5% level of significance with a probability (P-Value) of 0.027415. The value of R-squared 0.819721 or 82% meaning that 82% of the variation in exports was explained by the explanatory variables included in the model. The coefficient of the ECM denoted by ECT(-1) was -0.695063 with a probability of 0.0302 and this means it was significant at 5% level. It means that the deviation from the long-run equilibrium is corrected by 69.5% per year. The policy reforms and inflation were not found to be important determinants of exports.

Table 2: VECM for Imports Model
Dependent Variable: D(IMPORTS)

Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT(-1)	-0.869618**	0.435709	-1.995869	0.0176
D(FDI(-1))	-0.236008**	0.084277	-2.800384	0.0134
D(FDI(-2))	-0.180181***	0.058892	-3.059516	0.0079
D(FDI_POLICY(-1))	0.076105	0.235671	0.322929	0.7512
D(FDI_POLICY(-2))	-0.232393	0.211331	-1.099664	0.2888
D(GNI(-1))	0.557452**	0.192374	2.897751	0.0385
D(GNI(-2))	0.717867**	0.240078	2.990141	0.0281
D(INFLATION(-1))	0.023699	0.093508	0.253444	0.8034
D(INFLATION(-2))	-0.008196	0.063965	-0.128133	0.8998
D(POPULATION(-1))	-716.9083**	284.6773	-2.518319	0.0147
D(ER(-1))	0.140579**	0.065130	2.158437	0.0182
D(ER(-2))	0.887809**	0.424093	2.093430	0.0295
CONSTANT	3.777792	3.070152	1.230490	0.2375
R-squared	0.723183	Mean dependent var		0.140578
F-statistic**	7.507210	Durbin-Watson stat		1.784141
Prob(F-statistic)	0.020507			

***** implies significance at 1% level; ** implies significance at 5% level; * implies significance at 10% level**
Source: Author's Computation

From Table 2, F-statistics is 7.507210 and statistically significant at 5% level of significance with a probability (P-Value) of 0.020507. The value of R-squared 0.723183 or 72% meaning that 72% of the variation in imports was explained by the explanatory variables included in the model. The coefficient of the ECM denoted by ECT (-1) was -0.869618 with a probability of 0.0176 meaning it was significant at 5% level. It means that the deviation from the long-run equilibrium is corrected by 87% per year. The policy reforms and inflation were not found to be important determinants of imports. Analysis of specific objectives based on the VECM results are discussed below.

4.1 The effect of FDI on exports in Kenya

Table 1 shows the results of VECM analysis for exports as dependent variable and foreign direct investment, gross domestic product, inflation, population and exchange rate as independent variables. The results show that the coefficient of the FDI variable in the export equation was positive (0.177531) and statistically significant at 10% level as shown by the p-value of 0.0515. This implied that holding all other factors constant, an increase in FDI inflows by $1 million USD will lead to an increase in exports by 17%.

The coefficient of GDP variable was positive (0.516996) and statistically significant at 5% level because it had a p-value of 0.0228 which was less than 5%. This meant that holding all other factors constant, increasing GDP by $1 million USD would increase exports by 52%. Inflation was not statistically significant as the p-value of 0.1421 is greater than at 10% level of significant. It means that while it is expected that increase in inflation (general price levels increasing) in the economy would affect exports, in the case of Kenya, the impact has not been statistically significant. Population variable had a negative coefficient (-2315.699) and a p-value of 0.0070 which was at 1% level of significance, indicating that population variable was statistically significant at 1% level of significance. What the coefficient estimate implies is that an increase in population by one million people will

lead to a decrease in exports by 23157 percent. While it is true that the rate of population growth between 1970 and 2015 was greater than the rate of growth of exports, the magnitude given by the coefficient estimate of the variable is too large to be explained by the reality on the ground. Theoretically it is expected that as population increases, more labour would be available to produce more goods and services, including exports. However, in developing economies like Kenya, with the attendant structural rigidities in the market, growth in population may not necessary lead to increased production of export products. It may actually lead to increased consumption of domestically produced commodities, some of which are exports or inputs for production of exports. Exchange rate had a positive coefficient (1.552957) and with a p-value of 0.0279, it was statistically significant at 5% level. The positive coefficient meant that increasing exchange rate by one shilling per dollar has the potential to increase exports by 155%. Increase in exchange rate means that more units of local currency are needed to buy a dollar meaning that local products will fetch a higher price in the foreign market, thus increasing demand for exports. However, the magnitude given by the coefficient estimate solicits caution in as far as interpretation is concerned.

The test of overall significance as measured by F-statistic showed that all the variables in the model were jointly significant determinants of exports in Kenya. F-statistic had a p-value of 0.027415 which meant that the null hypothesis that all independent variables in the export model (FDI, GDP, inflation, population and exchange rate) were not jointly significant was rejected because the p-value was less than level of significance of 5%. The coefficient of determination (R-Squared) was 0.819721 meaning that 82% variation in exports in Kenya between 1970 and 2015 were explained by the variables included in the model. The study finding was consistent with the findings of Schive and Tu (1991) that foreign direct investment significantly determines exports.

4.2 The effect of FDI on imports in Kenya.

Table 2 represents the VECM results of imports as dependent variable whereas foreign direct investment, gross national income, inflation, population, and exchange rate are the independent variables.

The results show that the coefficient of FDI variable in imports equation is negative (-0.236008) and was statistically significant at 5% level because its p-value of 0.0134 was at 5% level of significance. The negative coefficient meant that increasing FDI by 1 million dollars would lead to a 24% decrease in imports. This can be attributed to the fact that when firms come to invest in Kenya as FDI, they produce goods for consumption locally which would otherwise have been imported.

Gross national income (GNI) variable had a positive coefficient (0.557452) with a p-value of 0.0385 which was significant at 5% level, meaning that GNI was statistically important determinant of imports. The positive coefficient meant that increasing GNI by 1 million dollars would increase imports by 55.7%. The VECM results also showed that inflation variable had positive coefficient (0.023699) but was not statistically significant because its p-value of 0.8034. Population variable had a negative coefficient (-716.9083) and was statistically significant at 5% with a p-value of 0.0147. This meant that increasing population by one million people would result to a decrease in imports by 717%. This is unexpected result since increase in population leads to increase in demand for imports. The large coefficient estimate for this variable also solicits caution in interpretation.

The coefficient of exchange rate variable was positive (0.140579) and statistically significant at 5% level. This is because its p-value of 0.0182 was at 5% level of significance. This implied that an increase in exchange rate, which implies strengthening of the domestic currency against the US dollar attracts imports. The strengthening of the Kenya shilling by 1% would result in a 14% increase in imports. F-statistic, a measure of overall significance of variables, was 7.507210 with p-value of 0.020507 implying that all the variables (foreign direct investment, gross national income, inflation, population, and exchange rate) were jointly statistically significant determinants

of imports variable. The value of R-Squared, the coefficient of determination, was 0.723183 meaning that 72% of variation in imports variable was explainable by the study's model.

6.0 Conclusions and Recommendations

The study results showed that foreign direct investment was an important determinant of exports. The other variables found to be important determinants of exports included gross domestic product, population, and exchange rate. Inflation and FDI policy reform were not found to be an important determinant of exports in Kenya. All the independent variables were however, jointly significant in determining inflation in Kenya as was inferred from F-statistic test of overall significance. Increase in GDP was found to lead to increasing exports. This was attributed to the fact that increase in GDP meant that production of export goods was also increasing thereby increasing exports. For the imports determination, the study found out that foreign direct investment, gross national income, population, and exchange rate were important determinants of imports. Just like in the case of exports, inflation and FDI policy reforms were not found to significantly influence imports. All the independent variables combined were significant determinants of imports in Kenya.

From the study results, it was empirically proven that foreign direct investment inflows in Kenya affect international trade through imports and exports. Other variables identified as important determinants of exports were gross domestic product, population, and exchange rate and those that affected imports are gross national income, population, and exchange rate. The increase in FDI, GDP, and exchange rates lead to an increase in exports while increase in population led to a decrease in exports in the exports model. The increase in Gross National Income, and exchange rates led to an increase in imports, while increase in FDI and population led to a decrease in imports in the imports model.

The following policy implications were deduced: first, foreign direct investment was found to have a negative significant effect on the imports. This means that FDI in Kenya encourages the use of imported inputs in the production of import substitutes. The government should provide more incentives to FDI that will produce both exports and import substitutes using local materials. Conversely, FDI firms that rely heavily on imported inputs to produce import substitutes should be discouraged by the government so as to reduce the widening gap between the values of exports and imports. Secondly, the other variables that were included in the models showed that growth in international trade is dependent on others factors other than foreign direct investment. The government should also focus on growing gross domestic product which was found to positively increase exports. Since gross national income was found to increase imports as expected, the government should come-up with policies that encourage people to consume domestically produced products.

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APPENDICES

Appendix A1: Breusch-Godfrey Serial Correlation LM Test (Export Equation)

F-statistic	5.784419	Prob. F(2,38)	0.0064
Obs*R-squared	10.73591	Prob. Chi-Square(2)	0.0047

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 07/30/18 Time: 19:22
Sample: 1970 2015
Included observations: 46
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6356987.	21095360	-0.301345	0.7648
FDI	0.033364	0.020710	1.611009	0.1154
GDP	-0.000673	0.000643	-1.046656	0.3019
INFLATION	-247151.8	369459.0	-0.668956	0.5076
POPULATION	0.777561	1.634819	0.475625	0.6371
ER	-100923.8	395277.5	-0.255324	0.7998
RESID(-1)	0.604418	0.180797	3.343075	0.0019
RESID(-2)	-0.274638	0.169774	-1.617668	0.1140

R-squared	0.233389	Mean dependent var	1.09E-08
Adjusted R-squared	0.092172	S.D. dependent var	20193075
S.E. of regression	19239968	Akaike info criterion	36.53965
Sum squared resid	1.41E+16	Schwarz criterion	36.85767
Log likelihood	-832.4119	Hannan-Quinn criter.	36.65878
F-statistic	1.652691	Durbin-Watson stat	1.898413
Prob(F-statistic)	0.150513		

Appendix A2: Breusch-Godfrey Serial Correlation LM Test (Import Equation)

F-statistic	3.147833	Prob. F(2,38)	0.0543
Obs*R-squared	6.537900	Prob. Chi-Square(2)	0.0380

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 07/31/18 Time: 13:16
Sample: 1970 2015
Included observations: 46
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11939087	56171727	-0.212546	0.8328
FDI	0.015796	0.047752	0.330792	0.7426
GNI	-0.000681	0.001599	-0.425891	0.6725
INFLATION	-266693.6	968015.2	-0.275506	0.7844
POPULATION	1.257533	4.322852	0.290904	0.7727
ER	-225401.1	1028268.	-0.219205	0.8277
RESID(-1)	0.405146	0.163433	2.478973	0.0177
RESID(-2)	-0.211052	0.172166	-1.225863	0.2278

R-squared	0.142128	Mean dependent var	4.60E-08
Adjusted R-squared	-0.015901	S.D. dependent var	50545484
S.E. of regression	50945755	Akaike info criterion	38.48719
Sum squared resid	9.86E+16	Schwarz criterion	38.80522
Log likelihood	-877.2054	Hannan-Quinn criter.	38.60633
F-statistic	0.899381	Durbin-Watson stat	1.942852
Prob(F-statistic)	0.516981		

Appendix A3: Heteroskedasticity Test (Breusch-Pagan-Godfrey Export Equation)

F-statistic	2.894101	Prob. F(5,40)	0.0254
Obs*R-squared	12.22025	Prob. Chi-Square(5)	0.0319
Scaled explained SS	23.87904	Prob. Chi-Square(5)	0.0002

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 07/30/18 Time: 19:27
Sample: 1970 2015
Included observations: 46

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.39E+14	9.08E+14	0.373348	0.7106
FDI	-1448577.	764583.5	-1.894596	0.0654
GDP	30937.88	25715.96	1.203061	0.2360
INFLATION	-3.93E+12	1.57E+13	-0.250318	0.8034
POPULATION	-36587043	69794527	-0.524211	0.6030
ER	1.75E+13	1.65E+13	1.060606	0.2950

R-squared	0.265658	Mean dependent var	3.99E+14
Adjusted R-squared	0.173865	S.D. dependent var	9.17E+14
S.E. of regression	8.33E+14	Akaike info criterion	71.67199
Sum squared resid	2.78E+31	Schwarz criterion	71.91051
Log likelihood	-1642.456	Hannan-Quinn criter.	71.76134
F-statistic	2.894101	Durbin-Watson stat	2.755602
Prob(F-statistic)	0.025368		

Appendix A4: Heteroskedasticity Test (Breusch-Pagan-Godfrey Import Equation)

F-statistic	3.675138	Prob. F(5,40)	0.0079
Obs*R-squared	14.48003	Prob. Chi-Square(5)	0.0128
Scaled explained SS	33.24570	Prob. Chi-Square(5)	0.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 07/31/18 Time: 13:23
Sample: 1970 2015
Included observations: 46

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.62E+14	5.95E+15	0.161681	0.8724
FDI	-14001409	4960271.	-2.822710	0.0074
GNI	367514.7	167992.5	2.187685	0.0346
INFLATION	8.59E+13	1.03E+14	0.833980	0.4093
POPULATION	-2.24E+08	4.56E+08	-0.491228	0.6259
ER	5.43E+13	1.08E+14	0.502777	0.6182

R-squared	0.314783	Mean dependent var	2.50E+15
Adjusted R-squared	0.229131	S.D. dependent var	6.23E+15
S.E. of regression	5.47E+15	Akaike info criterion	75.43413
Sum squared resid	1.20E+33	Schwarz criterion	75.67265
Log likelihood	-1728.985	Hannan-Quinn criter.	75.52348
F-statistic	3.675138	Durbin-Watson stat	2.657820
Prob(F-statistic)	0.007878		

Appendix A5: VECM Results for Export Model

Dependent Variable: D(EXPORTS)
Method: Least Squares
Date: 02/05/19 Time: 00:13
Sample (adjusted): 1974 2015
Included observations: 42 after adjustments

D(EXPORTS) = C(1)*(EXPORTS(-1) - 3.00301873658*POPULATION(-1) - 0.709629698275*ER(-1) + 35.8523967568) + C(2)*(FDI(-1) - 6.64274013529*POPULATION(-1) + 5.72593424734*ER(-1) + 75.9792198647) + C(3)*(FDI_POLICY(-1) - 0.738525553925 *POPULATION(-1) + 1.17192984947*ER(-1) + 7.75403631567) + C(4)*(GDP(-1) - 4.2470605379*POPULATION(-1) + 1.70070180244 *ER(-1) + 43.4177121679) + C(5)*(INFLATION(-1) - 1.23201099838 *POPULATION(-1) - 1.68498870016*ER(-1) + 24.4244307757) + C(6)*D(EXPORTS(-1)) + C(7)*D(EXPORTS(-2)) + C(8)*D(EXPORTS(-3)) + C(9)*D(FDI(-1)) + C(10)*D(FDI(-2)) + C(11)*D(FDI(-3)) + C(12) *D(FDI_POLICY(-1)) + C(13)*D(FDI_POLICY(-2)) + C(14) *D(FDI_POLICY(-3)) + C(15)*D(GDP(-1)) + C(16)*D(GDP(-2)) + C(17) *D(GDP(-3)) + C(18)*D(INFLATION(-1)) + C(19)*D(INFLATION(-2)) + C(20)*D(INFLATION(-3)) + C(21)*D(POPULATION(-1)) + C(22)

*D(POPULATION(-2)) + C(23)*D(POPULATION(-3)) + C(24)*D(ER(
-1)) + C(25)*D(ER(-2)) + C(26)*D(ER(-3)) + C(27)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.695063	0.653311	1.063908	0.3042
C(2)	0.218863	0.115550	1.894098	0.0777
C(3)	0.051091	0.263625	0.193802	0.8489
C(4)	-2.354121	1.087958	-2.163798	0.0470
C(5)	0.256393	0.148350	1.728298	0.1045
C(6)	-1.405214	0.704957	-1.993333	0.0647
C(7)	-1.008058	0.410840	-2.453651	0.0268
C(8)	-0.192694	0.390298	-0.493710	0.6287
C(9)	0.177531	0.083920	2.115479	0.0515
C(10)	0.138835	0.054785	2.534179	0.0229
C(11)	-0.078753	0.034220	-2.301373	0.0361
C(12)	0.108552	0.232577	0.466736	0.6474
C(13)	0.100928	0.228554	0.441594	0.6651
C(14)	-0.136709	0.246541	-0.554508	0.5874
C(15)	0.516996	0.194772	2.654365	0.0228
C(16)	-0.043127	0.690593	-0.062449	0.0195
C(17)	-0.045689	0.702952	-0.064996	0.9490
C(18)	-0.141397	0.091263	-1.549335	0.1421
C(19)	-0.087951	0.056415	-1.559000	0.1398
C(20)	-0.100408	0.043190	-2.324797	0.0345
C(21)	-2315.699	741.0587	-3.124852	0.0070
C(22)	3854.099	1200.220	3.211160	0.0058
C(23)	-1895.206	576.8034	-3.285705	0.0050
C(24)	1.552957	0.731770	2.122193	0.0279
C(25)	0.788531	0.282842	2.787885	0.0143
C(26)	0.548330	0.882665	0.621221	0.5438
C(27)	11.62912	4.878835	2.383585	0.0308

R-squared	0.819721	Mean dependent var	0.128990
Adjusted R-squared	0.507237	S.D. dependent var	0.164262
S.E. of regression	0.115307	Akaike info criterion	-1.226342
Sum squared resid	0.199436	Schwarz criterion	-0.109268
Log likelihood	52.75318	Hannan-Quinn criter.	-0.816890
F-statistic	2.623240	Durbin-Watson stat	2.472988
Prob(F-statistic)	0.027415		

Appendix A6: VECM Results for Import Model

Dependent Variable: D(IMPORTS)
Method: Least Squares
Date: 02/06/19 Time: 12:37
Sample (adjusted): 1974 2015
Included observations: 42 after adjustments
D(IMPORTS) = C(1)*(IMPORTS(-1) - 5.18960504912*POPULATION(-1) +
1.43083589405*ER(-1) + 65.1833471994) + C(2)*(FDI(-1) -
7.87706468726*POPULATION(-1) + 5.94320218833*ER(-1) +
96.2698784375) + C(3)*(FDI_POLICY(-1) + 0.113437062446
*POPULATION(-1) + 0.682342213819*ER(-1) - 5.08521548986) +

C(4)*(GNI(-1) - 4.78460675327*POPULATION(-1) + 1.98504677843 *ER(-1) + 51.6275433499) + C(5)*(INFLATION(-1) + 0.518089135228*POPULATION(-1) - 2.43994862557*ER(-1) - 2.81073048691) + C(6)*D(IMPORTS(-1)) + C(7)*D(IMPORTS(-2)) + C(8)*D(IMPORTS(-3)) + C(9)*D(FDI(-1)) + C(10)*D(FDI(-2)) + C(11) *D(FDI(-3)) + C(12)*D(FDI_POLICY(-1)) + C(13)*D(FDI_POLICY(-2)) + C(14)*D(FDI_POLICY(-3)) + C(15)*D(GNI(-1)) + C(16)*D(GNI(-2)) + C(17)*D(GNI(-3)) + C(18)*D(INFLATION(-1)) + C(19)*D(INFLATION(-2)) + C(20)*D(INFLATION(-3)) + C(21)*D(POPULATION(-1)) + C(22) *D(POPULATION(-2)) + C(23)*D(POPULATION(-3)) + C(24)*D(ER(-1)) + C(25)*D(ER(-2)) + C(26)*D(ER(-3)) + C(27)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.869618	0.435709	-1.995869	0.0176
C(2)	0.296151	0.105367	2.810662	0.0132
C(3)	0.041817	0.258780	0.161593	0.8738
C(4)	0.556010	0.784985	0.708307	0.4896
C(5)	0.041757	0.144824	0.288329	0.7770
C(6)	0.084393	0.498657	0.169241	0.8679
C(7)	-0.060410	0.391127	-0.154451	0.8793
C(8)	-0.072801	0.299611	-0.242985	0.8113
C(9)	-0.236008	0.084277	-2.800384	0.0134
C(10)	-0.180181	0.058892	-3.059516	0.0079
C(11)	-0.087914	0.033682	-2.610118	0.0197
C(12)	0.076105	0.235671	0.322929	0.7512
C(13)	-0.232393	0.211331	-1.099664	0.2888
C(14)	0.088436	0.237231	0.372784	0.7145
C(15)	0.557452*	0.192374	2.897751	0.0385
C(16)	0.717867*	0.240078	2.990141	0.0281
C(17)	-0.060467	0.681916	-0.088672	0.9305
C(18)	0.023699	0.093508	0.253444	0.8034
C(19)	-0.008196	0.063965	-0.128133	0.8998
C(20)	-0.008517	0.048282	-0.176401	0.8623
C(21)	-716.9083	284.6773	-2.518319	0.0147
C(22)	1309.300	899.1816	1.456102	0.0166
C(23)	-710.0780	448.2712	-1.584037	0.1340
C(24)	0.140579	0.065130	2.158437	0.0182
C(25)	0.887809	0.424093	2.093430	0.0295
C(26)	0.324000	0.765256	0.423388	0.6780
C(27)	3.777792	3.070152	1.230490	0.2375

R-squared	0.723183	Mean dependent var	0.140578
Adjusted R-squared	0.243367	S.D. dependent var	0.145711
S.E. of regression	7.507210	Akaike info criterion	-1.037162
Sum squared resid	0.020507	Schwarz criterion	0.079911
Log likelihood	48.78041	Hannan-Quinn criter.	-0.627711
F-statistic	1.507210	Durbin-Watson stat	1.784141
Prob(F-statistic)	0.205037		