

## EFFECT OF INTRA-AFRICAN REGIONAL TRADE ON ECONOMIC GROWTH IN EAST AFRICAN COMMUNITY

**Diana Ngonyo Kitavi**

Jomo Kenyatta University of Agriculture and Technology,

Nairobi, Kenya

dianakitavi@gmail.com

### ABSTRACT

*This study sought to determine the impacts of intra-African regional trade on economic growth in East African Community. Specifically, the study sought to; determine the relationship between; exports and economic growth, foreign direct investment and economic growth and imports and economic growth. The study was guided by the neoclassical growth theory and endogenous growth theory. The study used a quantitative research design and the time series methodology. The target (accessible population) was 10 years. The sample size of this study will be 10 years. The study used secondary data sources to gather information relevant in reaching at the research objectives. The secondary data was obtained from the CBK and the (KNBS) Kenya National Bureau of Statistics reports. The data was modeled in time series. A multiple linear regression model using Ordinal Least Squares were used to test the significance of the influence of the independent variables on the dependent variable. It was concluded that there was co-integration in the long run exports and imports. Results also indicated that in the long run, exports and imports had a positive and significant relationship with the long-run GDP. There was also the case of the short run imports which exhibited a positive and significant relationship with the short-run GDP and thus the conclusion that both the short-run as well as the long-run variations in GDP was due to the variations of long-run exports and both the short-run and long-run imports. The study recommended that; the EAC countries should adopt export diversification strategy in a bid to increase aggregate economic growth, the EAC countries should encourage intra-African regional trade since increase in the volume of trade results to increase in the aggregate GDP.*

**Key Words:** *Intra- African Trade, Economic Growth*

## 1. INTRODUCTION

Different countries have experienced different growth experiences hence growth still remains a complex issue which has brought about many discussions all over the world. For example from 1970-2007 every region experienced changes in economic growth where some grew faster while others grew at a slower rate. Growth in North America was moderate at 33.3% in 1970 and still at 33.3% by 2007. In Western Europe the growth rate was 34% in 1960 which declined to 25% in 2007. In Asia the rate was at 19% in 1970 and 28% by 2007 ( World bank, 2009).

Looking at the case in African countries growth rate was below the average of the world in 1820, Africa's per capita income was 40% less than the world average. The gap widened to 60% in 1950, and almost 80% in 2000. According to United Nations Economic Commission of Africa, In 2009 the economic growth was 5.1% which fell to 2% in 2008 as a result of falling exports due to reduction in trade activities and global recession which was a contagion effect.

The Kenyan economy has been erratic in the recent past. According to Amanja and Morrisey (2005) Kenya has had mixed economic performances since independence. The growth of real GDP averaged 6.6% per year over the period 1964-1973 and compared favorably with some of the newly industrialized countries of East Asia. According to them, this performance was due to consistency of economic policy, promotion of small holder agricultural farming through trade (intra trade) and hence expansion of market for domestic outputs within East African region. In 2010, Africa's gross domestic product was approximately \$1.6 trillion compared with U.S which was \$14.5 trillion.

There are several discussions on how trade can affect economic growth. Firstly, trade is a vehicle through which technological innovations and knowledge can be transferred between participating countries (Sala-i-martin and Barro, 1997). Higher trade openness open ups competition in the local market which in turn increase productive efficiency and economic growth (Vickers and Yarrow, 1991). Alcalá and Ciccone (2003) demonstrate that trade mattered for growth and where domestic markets are smaller, suggesting that countries with smaller domestic markets benefit more from trade openness. By increasing market size, trade openness allows economies to capture the benefits of increasing returns to scale (Ades and Glaeser, 1999).

In East Africa, the quest for efficiency in port operations, professionalism in customs procedures which allow for faster clearance of goods is now a matter of concern. In the pursuit of a fully fledged customs union, a common market, single currency and finally a political federation, East African Customs Union has been able to eliminate all tariffs on intra- East African trade and agreed on a Common External Tariff (CET) for goods that do not originate from East Africa. This considerably contributed towards cutting a proportion of costs of up to € 300 million to the taxes foregone by partner states in their Preferential Trade Arrangements. Nevertheless, the costs to trade attributed to non tariff barriers (NTBs) have more far reaching repercussions than those attributable to tariffs (Hoekman et al., 2013).

There are several discussions on how trade can affect economic growth. Firstly, trade is a vehicle through which technological innovations and knowledge can be transferred between participating countries (Sala-i-martin and Barro, 1997). Higher trade openness open ups competition in the local market which in turn increase productive efficiency and economic growth (Vickers and Yarrow 1991). Alcalá and Ciccone (2003) demonstrate that trade mattered for growth and where domestic markets are smaller, suggesting that countries with smaller domestic markets benefit more from trade openness. By

increasing market size, trade openness allows economies to capture the benefits of increasing returns to scale (Ades and Glaeser, 1999).

### *1.2 Statement of the Problem*

Ensuring the economic growth is stable is the dream of every region of the world. In general economic objectives of both global trade liberalization and Regional trade agreements are to reduce barriers of trade between countries and spur Economic growth. Studies in the European Union show that regional integration and its effect on trade and growth has been positive in some analyses (Henrekson et al.,1997) while in others ,EU membership appears insignificant in explaining GDP growth rates (Vamvakids, 1999).

Africa is characterized by large number of land locked markets which highly dependent on neighboring countries hence the need for regional integration. At least every country in Africa is a member of Regional Economic Community with most belonging to one or two or more. This multiple membership hinders regional integration and hence affects intra regional (African) trade on the rest of the world and hence Growth. Though intra-African trade in the EAC has been increasing year by year, the economic growth is not increasing as opposed to many studies on the relationship between economic growth and trade. This study seeks to fill this knowledge gap based on the EAC.

### *1.3 Objectives of the study*

#### *1.3.1 General Objective*

The general objective of this research was to determine the impacts of intra-African regional trade on economic growth in EAC.

#### *1.3.2 Specific Objective*

Specific Objectives of the study were:-

- i) To determine the relationship between exports and economic growth.
- ii) To determine the relationship between foreign direct investment and economic growth.
- iii) To determine the relationship between imports and economic growth.

### *1.4 Justification of the Study*

The findings of this research will be of great use to players in the economy in various ways. Firstly, the findings of the study will provide investors with a highlight of the areas they should be focused in when investing hence engage in activities which have prospects of increasing growth in Africa. The study will also enable members in Regional Economic communities to work on regional integration, economic diversification and in adopting customs that are friendly to enable free movements of goods and services hence promoting intra-African trade.

The study will enable the government in the African countries consider policies and regulations which will attract intra-African trade hence providing room for FDI and foreign investors Africa.

### *1.5 Scope of the Study*

The scope of the study is limited to the period year 1980-2012. It mainly focused on the East Africa Community been the poorest region of all countries and due to availability of data.

### 1.6 Limitation of the Study

The anticipated challenges lie in the accuracy of the data because the study will use data from different sources. The major limitation of the study was that it focused on selected variables only.

## 2. LITERATURE REVIEW

There are several theories related to the impact of intra-Africa trade on economic growth. These theories are neoclassical growth theory and endogenous growth theory.

### 2.2.1 Neoclassical Growth Theory

Solow (1956) developed neoclassical growth model. The theory outlines how a steady economic growth rate will be accomplished with the proper amounts of the three driving forces: labour, capital and technology. It states that by varying the amounts of labour and capital in the production function, an equilibrium position can be achieved. This theory emphasizes that technological change has a major influence on economic growth. It further argues that economic growth will not continue unless there are continuous advances in technology. The neoclassical theory proposes that long-run economic growth arises from two exogenous factors namely: technological progress and labour force growth.

According to the neoclassical theory, exports, foreign direct investment and imports inflows provide a solution in filling: the saving-investment gap; the foreign exchange gap; and the fiscal gap in less developed countries. This act as an engine of the economic growth of the host economies through increasing capital formation, augmenting employment, promoting manufacturing growth, bringing management expertise and establishing brand name, and providing the skilled labour with an access to the international production network. Neoclassical theory considered the role of uncertainty in investment decisions. It stipulates that if investors are uncertain of the future returns they may reduce the investments or completely fail to invest. The theory states that there is a negative link between uncertainty and investment thus foreign direct investment volatility has impacts on economic growth (Boreinstain et al, 1998)

### 2.2.2 Endogenous Growth Theory

These are equilibrium models of endogenous growth where technological change is the primary driver of long run growth through accumulation of knowledge by forward looking, profit maximizing agents (Romer, 1986). The endogenous growth theory points out that exports, foreign direct investment and imports have a long-run effect on the growth of output. In order to explain the role of exports, foreign direct investment and imports in the long term growth of host countries, Barro and Sala-i-Martin,(1995); Mankiw,(1992); and Romer,(1986); amended the neoclassical growth model by Solow by including the growth-driving factors of human capital as well as physical capital to explain the importance of exports, foreign direct investment and imports in developing countries.

They made it possible to model exports, foreign direct investment and imports as stimulating economic growth in the long run through the permanent knowledge transfer. Since knowledge is considered an externality, it will account for the non-diminishing returns that result in long run growth. Therefore, making growth determinants includes exports, foreign direct investment and imports endogenous in the model, long run effects of exports, foreign direct investment and imports will follow. A particular channel through which technology spills over from advanced to less developed countries is through the flow of foreign direct investment. Thus exports, foreign direct investment and imports not

only contributes to economic growth through capital formation and technology transfers but also does so through the augmentation of the level of knowledge through labor training and skill acquisition.

According to endogenous growth theory, exports, foreign direct investment and imports affects economic growth through three main channels. First, exports, foreign direct investment and imports increases capital accumulation by introducing new inputs and technologies; Second, they advances the level of knowledge and skills through labor and manager training; and thirdly, they increases competition in the host country industry by overcoming entry barriers and reducing the autonomy of existing firms. The theory postulates that exports, foreign direct investment and imports have a positive effect on economic growth, whereas the volatility in exports, foreign direct investment and imports inflows has a negative effect on economic growth. It then states that exports, foreign direct investment and imports positively affect growth by decreasing the costs of research and development (R&D) through stimulating innovation.

### *2.3 Empirical Review*

There are various studies that have identified exports, foreign direct investments and imports as determinants of economic growth.

#### *2.3.1 Exports and Economic Growth*

Otinga (2009) investigated the impact of international trade on Kenya's economic growth by specifically examining the role of exports vis-a-vis other components of the GDP over a span of about twenty two years. The impact of imports on economic growth was also examined. The study adopted a linear model to examine the impact of both public and private investment, government expenditure, foreign aid, imports and exports to the GDP. Overall, the results showed that growth in real exports caused real GDP growth. Moreover, it was found out that: Government expenditure and Foreign aid were positively correlated with the GDP and statistically significant; Public investments though statistically significant, were found to be negatively correlated to the GDP; and Private investments were found to be negatively correlated to the GDP and statistically insignificant. In broad terms, the results of this study were supportive of the Export Led Growth Strategy which postulates that exports lead to economic growth.

#### *2.3.2 Foreign Direct Investment and Economic Growth*

Sanda (2011) examined the impact of foreign aid on economic growth in Kenya using time series data for the period 1970 - 2008 using a modified Harrod Domar growth model. Results showed that foreign aid had a positive impact on economic growth rate. However, the impact was found to be modest. Results also showed that foreign direct investment was more effective in stimulating economic growth rate than foreign aid.

Ngeny (2013) investigated empirical the impact foreign direct investment volatility in Kenya. Secondary data was used and sourced from the United Nation Centre on Trade and development (UNCTAD), World Bank database and Kenya National Bureau of Statistics. The period of study was 1970– 2011. An endogenous growth model was estimated using the ordinary least squares to determine the relationship between the FDI volatility and economic growth. Using bounds testing approach, it showed that FDI volatility retards long-run economic growth in Kenya. Results suggested that FDI had a positive result on growth whereas FDI volatility had a negative impact on growth. Trade openness was not FDI inducing, thus affecting growth negatively. Labour force had a positive impact on growth.

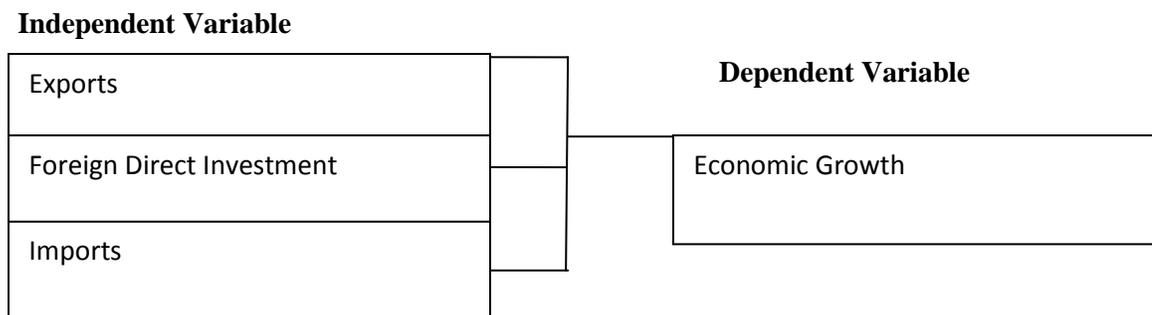
Foreign Direct Investment in Kenya contributed positively to economic growth, although its overall effect on economic growth may not be significant. The volatility of capital flows may make it harder for the stable and predictable macroeconomic policies to be followed. Therefore unstable inflows may dampen investment, hence affecting economic growth.

### 2.3.3 Imports and Economic Growth

Khaguli (2013) investigated the factors affecting trade Facilitation at the border points of East Africa and their impact on trade Facilitation. The goal of the study was ultimately to answers the question as to whether facilitation can reduce costs of doing business and if trade facilitation leads to economic growth of East African countries. The paper utilized the Gravity Model to establish the relationship between variables. The model was run using a fixed effect and a random effect .Horseman test was later on conducted to determine between the fixed effect and random model which was suitable. Secondary data was sourced from World Bank data base and CEPIL, International Monetary Fund (IMF) year book. Empirical results indicated that the border points in East Africa play an important part in trade facilitation if impediments to trade are addressed .The 8 border points in the study exhibited cross cutting non tariff barriers which impacted negatively on trade facilitation and increased costs of doing business. Trade facilitation led to enhanced trade flows and economic growth. Recommendations made were that governments should invest in trade facilitation initiatives for economic growth of East African Countries among others.

### 2.4 Conceptual Framework

Orodho (2008) stated that a conceptual framework is a model representation where a researcher represents the relationships between variables in the study and shows the relationship graphically and diagrammatically. The dependent variable in this study is economic growth. The independent variables include exports, foreign direct investment and imports.



**Figure 1: Conceptual Framework**

(Source: Author 2014)

## 3. RESEARCH METHODOLOGY

### 3.1 Research Design

The research design that was employed in this study is quantitative research design. The time series methodology was used. Quantitative research focuses on filters out results and help in realization of

unbiased results De Vaus, 2001). It also assists in establishing a cause and effect between variables (Mugenda and Mugenda, 2003).

The dependent variable was economic growth for the year 2004 to 2013 (10 years or 40 quarters). The independent variables are exports, foreign direct investment and imports. The choice of the years is because of data availability.

### 3.2 Target Population

A population is the total collection of elements about which a researcher wishes to make some inferences, (Cooper et al 2000). The target (accessible population) was 10 years.

### 3.3 Sample

The sample size of this study was 32 years. This implies that a time series methodology was used.

### 3.4 Data Collection Procedures

The study used secondary data sources to gather information relevant in reaching at the research objectives. The secondary data was obtained from the CBK and the (KNBS) Kenya National Bureau of Statistics reports. The study's data collection source was justified by the fact that data on exports, foreign direct investment and imports are available in the CBK while the same works hand in hand with KNBS in making such statistics and estimation.

The scope of the study was to determine the effect of intra- Africa regional trade on economic growth. The geographical scope of this study was East Africa. The study used secondary data. The data was annual and run for 32 years from 1980- 2012. The choice of the years was because of data availability.

### 3.5 Analytical Model

The data was modeled in time series. A multiple linear regression model using OLS was used to test the significance of the influence of the independent variables on the dependent variable. The multiple linear regression model that was used is as laid below.

$$Y_t = a + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + e$$

Where;

Y= Economic Growth (dependent variable)

$X_{1t}$ – Exports

$X_{2t}$ – Foreign Direct Investment

$X_{3t}$  – Imports

$a$  - is the constant term

$\beta$ = This represents the Beta values of the independent variables

$\beta_1$ = The coefficient representing Exports

$\beta_2$ = The coefficient representing Foreign Direct Investment

$\beta_3$  = The coefficient representing Imports

$e$  is the error term which is assumed to be normally distributed with mean zero and constant variance.

### 3.5.1 Time Series Methodology

#### *Step 1: Descriptive Results*

Descriptive results were presented

#### *Step 2: Trend Analysis*

The trend for the variables was presented

#### *Step 3: Normality of the Data*

The normality of data was tested using the Jacque Bera test.

#### *Step 4: Multi-collinearity*

Multi-collinearity of the data was tested using pearson correlation coefficients. The rule of the thumb is that a correlation coefficient of more than 0.8 indicate serious multi-collinearity

#### *Step 5: Autocorrelation*

The data was tested for autocorrelation using the LM test. Autocorrelation was corrected by adding lags

#### *Step 6: Run the unit roots*

*Step 7: Test for co-integration using Engle Granger and Johansen Test*

*Step 8: Run the long run model*

*Step 9: Estimate the Error Correction Model (ECM)*

*Step 10: Report the results*

## 4. RESULTS

### 4.1 Descriptive Statistics

This study provides results on measures of central tendency of the variables; GDP, exports, foreign direct investment and imports being measured in the study. Results in Table 1 show that show that the maximum and minimum values whose observations above or below the indicated ones are wrong. The results show that the overall mean of GDP was 1200 (million \$) which indicates the average of GDP in EAC. The median of GDP was 1100 (million \$) which imply that half of the observations of the GDP had this value during the period 1980 and 2012. GDP had a standard deviation of 446 which indicates that the GDP varied through ought the measurement period.

The results show that the overall mean of exports was 105 (million \$) which indicates the average of exports in EAC. The median of exports was 95.35 (million \$) which imply that half of the observations of the exports had this value during the period 1980 and 2012. The observations of exports had a standard deviation of 47.50 which indicates that the exports varied through ought the measurement period.

The results also show that the overall mean of FDI was 1.23 (million \$) which indicates the average of FDI in EAC. The median of FDI was 0.58 (million \$) which imply that half of the observations of the FDI had this value during the period 1980 and 2012. The observations of FDI had a standard deviation of 2.27 which indicates that the FDI varied through ought the measurement period.

Further, the results show that the overall mean of imports was 353 (million \$) which indicates the average of imports in EAC. The median of imports was 271 (million \$) which imply that half of the observations of the imports had this value during the period 1980 and 2012. The observations of imports had a standard deviation of 238 which indicates that the imports varied through ought the measurement period.

**Table 1: Descriptive Statistics**

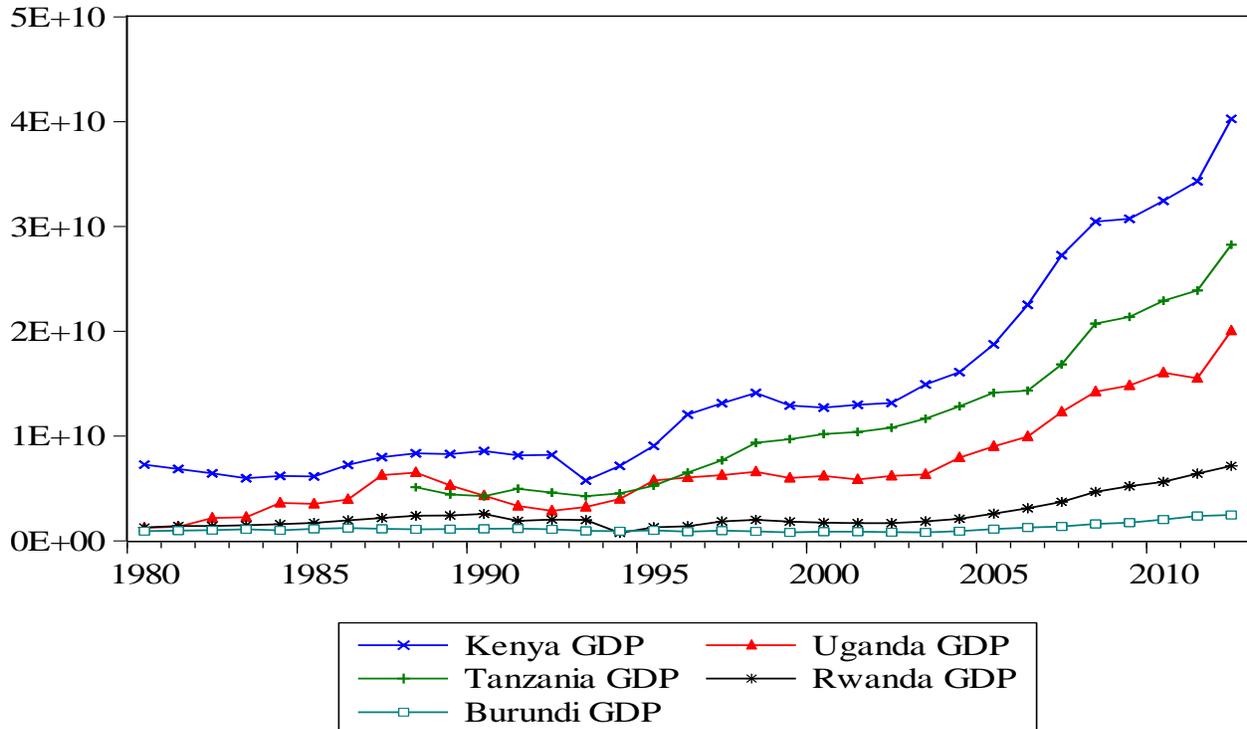
Indicator	GDP (million \$)	EXPORTS(million \$)	FDI(million \$)	IMPORTS(million \$)
Mean	1200	105	1.229341	353
Median	1100	95.352957	0.5759643	271
Maximum	2470	221	11.683518	926
Minimum	785	38.676369	0.000010744	129
Std. Dev.	446	47.49602	2.269029	238

#### 4.2 *Trend Analysis*

This section provides graphical representation of the movement and changes of the variables under study over the years 1980 to 2012.

##### 4.2.1 Annual Trend Analysis of GDP

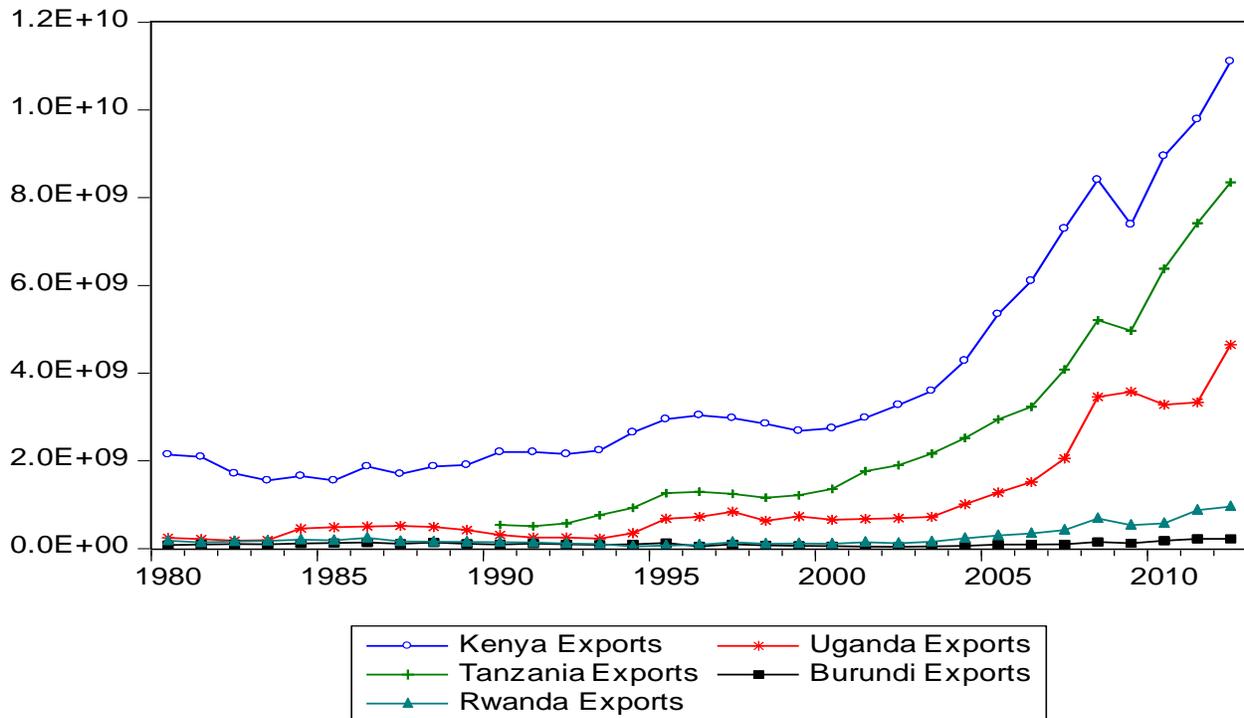
Results in Figure 2 show the trend analysis of GDP over the years 1980 to 2012 for EAC countries. The graph shows that the GDP for Kenya was the highest compared to the other countries. Specifically, the GDP for Kenya increased steadily from the year 1980 to 1994 after which it declined and then increased steadily from the year 1996 up to the year 1999, then it stagnated up to the year 2003 and later increased steadily up to the year 2007, then it stagnated for one year and later increased steadily up to the year 2012. The GDP for Uganda increased steadily from the year 1980 to 1989 after which it declined up to the year 1993 and then increased steadily up to the year 2012. Tanzania recorded no GDP from 1980 to 1988. The recorded GDP from the year 1989 increased steadily up to the year 2012. The GDP for Rwanda was constant from the year 1980 up to 1994 after which it declined and the increased steadily up to the year 2012. The GDP for Burundi was constant from 1980 to 2012.



**Figure 2: Trend Analysis of GDP (\$)**

#### 4.2.2 Annual Trend Analysis of Exports

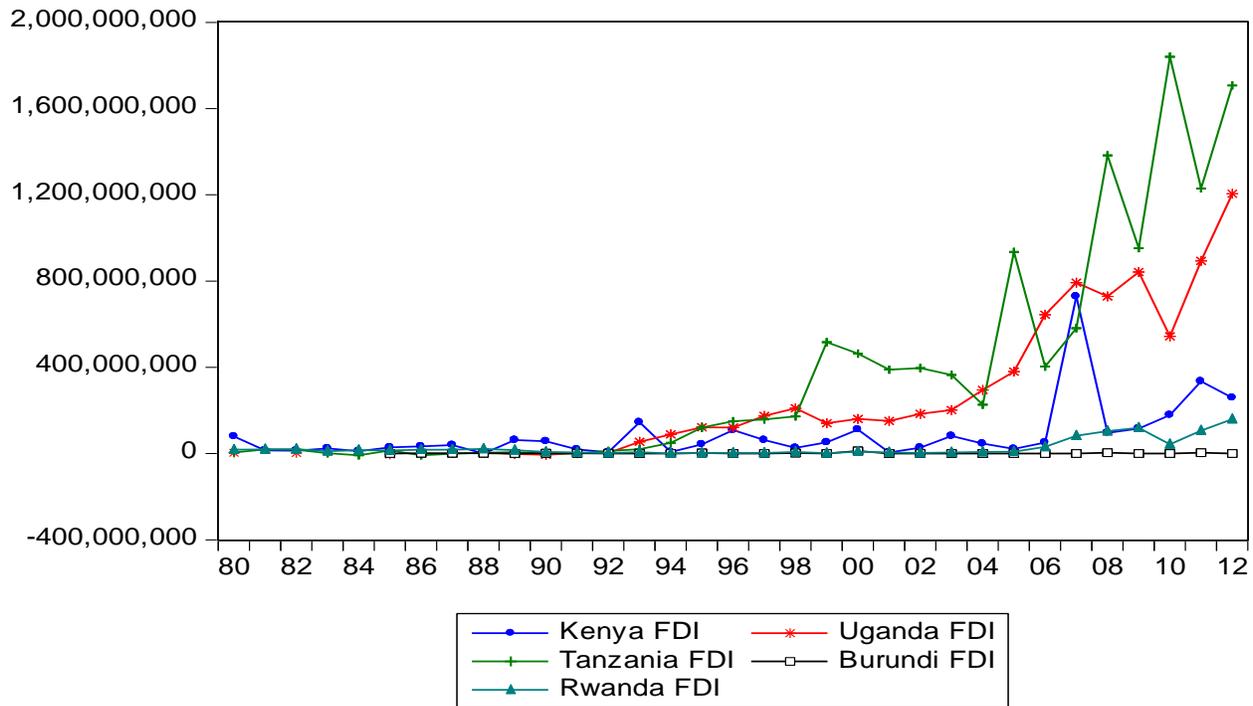
Results in Figure 3 show the trend analysis of exports over the years 1980 to 2012 for EAC countries. The graph shows that the exports for Kenya were the highest compared to the other countries. Specifically, the exports for Kenya decreased steadily from the year 1980 to 1984 and then increased steadily up to the year 2008 when they declined for one year and later increased steadily up to the year 2012. The exports for Uganda were constant from the year 1980 up to 1984 after which they increased steadily up to the year 1989 and then stagnated up to the year 1994. Further, the exports increased steadily up to the year 1994 and then stagnated up to the year 2004 after which they increased steadily up to the year 2012. Tanzania recorded no exports from 1980 to 1990. The recorded exports from the year 1991 increased steadily up to the year 2009 after which they declined for one year and then increased steadily up to the year 2012. The exports for Rwanda were constant from the year 1980 up to 2005 after which they increased steadily up to the year 2012. The exports for Burundi were constant from the year 1980 to 2012.



**Figure 3: Trend Analysis of Exports (\$)**

#### 4.2.3 Annual Trend Analysis of FDI

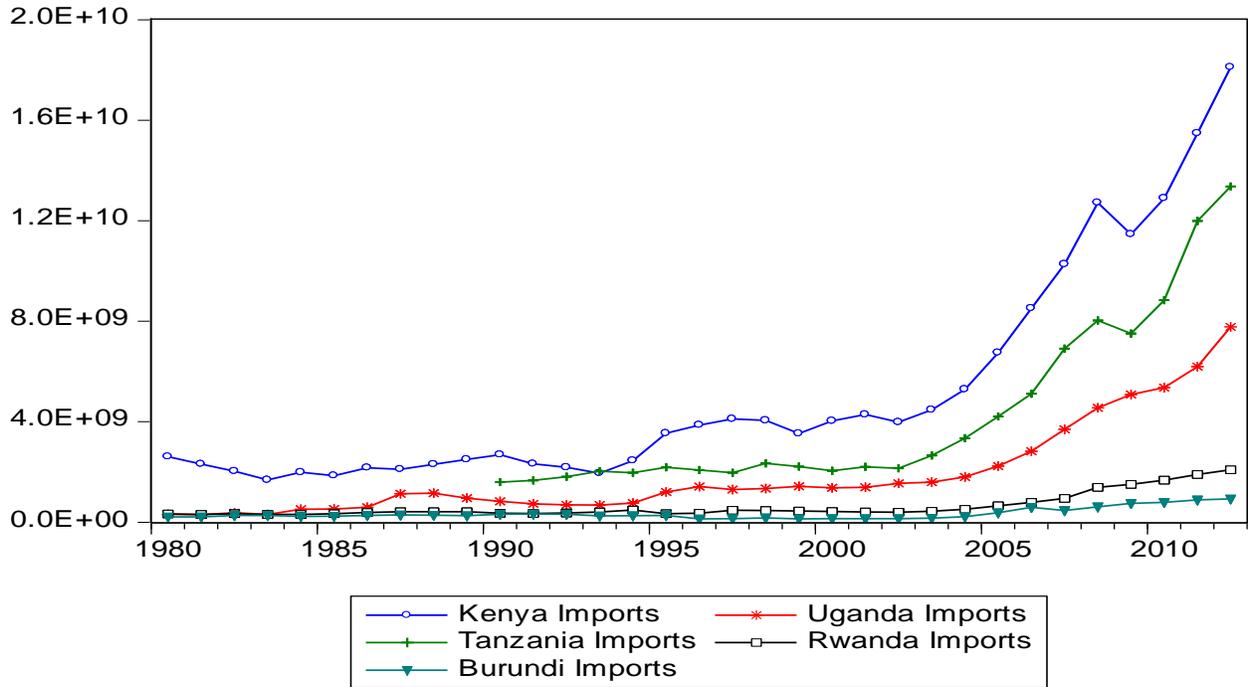
Results in Figure 4 show the trend analysis of FDI over the years 1980 to 2012 for EAC countries. The graph shows that the FDI for all the EAC countries was constant from the year 1980 to 1993. Further, the graph shows that Tanzania had the highest FDI compared to the other countries. Specifically, the FDI for Kenya was constant from the year 1980 to 1993 after which they increased un-uniformly up to the year 2007 when they increased sharply for one year and then declined for one year and later increased steadily up to the year 2012. The FDI for Uganda were constant from the year 1980 up to 1984 after which they increased steadily up to the year 2008 after which they declined for one year and then increased during the year 2010. Further, the FDI declined sharply during the year 2010 then increased sharply up to the year 2012. The FDI for Tanzania was constant from the year 1980 to 1993 after which they increased and declined un-uniformly up to the year 2012. The FDI for Rwanda were constant from the year 1980 up to 2007 after which they increased steadily up to the year 2009, declined during 2010 and then increased steadily up to the year 2012. The FDI for Burundi were constant from the year 1980 to 2012.



**Figure 4: Trend Analysis of FDI (\$)**

#### 4.2.4 Annual Trend Analysis of Imports

Results in Figure 5 show the trend analysis of imports over the years 1980 to 2012 for EAC countries. The graph shows that the imports for Kenya were the highest compared to the other countries. Specifically, the imports for Kenya decreased steadily from the year 1980 to 1984 and then increased steadily up to the year 1994 when they declined. Further, they increased steadily up to the year 2007, then declined for one year and later increased steadily up to the year 2012. The imports for Uganda increased steadily from the year 1980 to 1989 after which they stagnated up to the year 1995 and then increased steadily up to the year 2012. Tanzania recorded no imports from 1980 to 1988. The recorded imports from the year 1989 increased steadily up to the year 2009 after which they declined for one year and then increased steadily up to the year 2012. The imports for Rwanda were constant from the year 1980 up to 2005 after which they increased steadily up to the year 2012. The imports for Burundi were constant from the year 1980 to 2012.



**Figure 5: Trend Analysis of Imports (\$)**

4.3 Pre-Estimation Tests

4.3.1 Normality Test

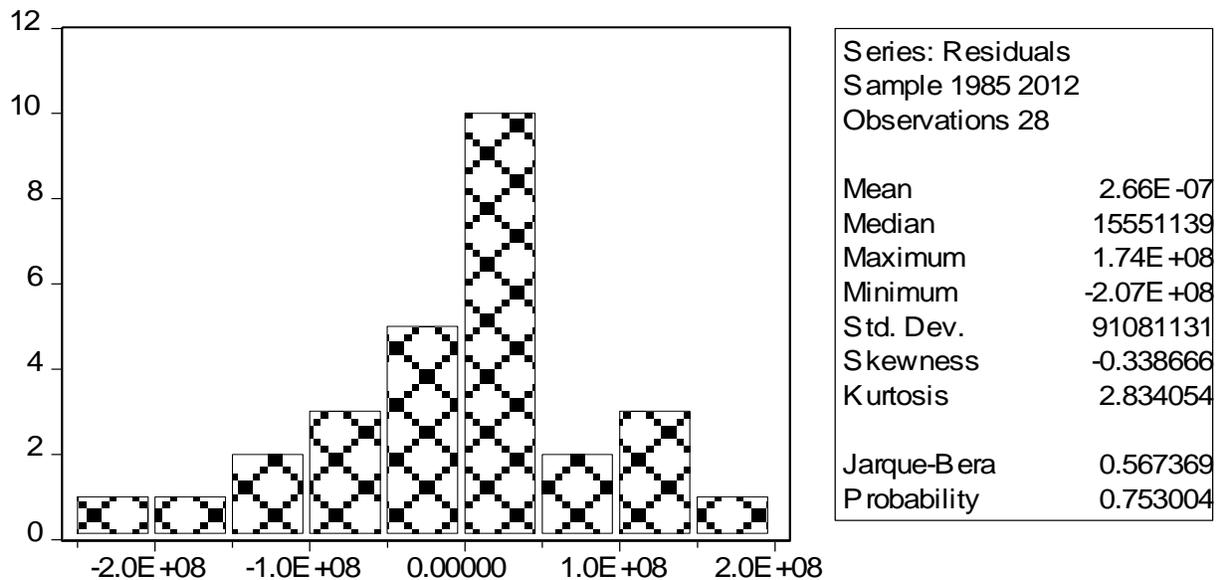
Initial tests of skewness and kurtosis indicate that the data is normally distributed. However, Jarque bera test is a more conclusive test for normality. The null hypothesis that the distribution of the data is not significantly different from a normal distribution was rejected at the critical p value of 0.05. Thus implies that the data was not normally distributed except Exports. The normality test is given in Table 2. The distribution curve of the variables that are; GDP, exports, FDI and imports were positively skewed.

**Table 2: Normality Statistics**

Indicator	GDP	EXPORTS	FDI	IMPORTS
Skewness	1.669	0.906	3.720	1.231
Kurtosis	4.901	3.504	17.435	3.291
Jarque-Bera	17.222	4.124	307.669	7.176
Probability	0.000	0.127	0.000	0.028
Observations	32	32	32	32

The Jarque-Bera test was also used to test the normality the residuals. Figure 6 below indicates that the residuals originating from the model were normally distributed. This implies that the data is ideal for

parametric analysis such as regression analysis. This was supported by a Jarque-Bera statistic of 0.567 and a p value of 0.753.



**Figure 6: Jarque-Bera Normality Graph**

#### 4.3.2 Multi-Collinearity Tests (Pearson Correlation)

Results in Table 3 present results of person's' bivariate correlation. The results indicate that the variables; exports (0.885), FDI (0.051) and imports (0.962) had positive correlation /association with GDP. However, only imports and exported were significantly associated/correlated with GDP. Exports and imports were also highly and significantly correlated/associated which an indicator of multicollinearity is. However, the multicollinearity was not too high to warrant the elimination of one of the variables.

**Table 3: Correlation Matrix**

Variable	GDP	EXPORTS	FDI	IMPORTS	
GDP	Pearson Correlation Sig. (2-tailed)	1			
EXPORTS	Pearson Correlation Sig. (2-tailed)	0.885 0.000	1		
FDI	Pearson Correlation Sig. (2-tailed)	0.051 0.798	0.055 0.779	1	
IMPORTS	Pearson Correlation Sig. (2-tailed)	0.962 0.000	0.814 0.000	0.005 0.978	1

\*\* Correlation is significant at the 0.01 level (2-tailed).

#### 4.3.3 Heteroscedasticity

Heteroscedasticity test was run in order to test whether the error terms are correlated across observation in the cross section data. The null hypothesis is that the data does not suffer from heteroskedasticity. The null hypothesis was not rejected at a critical p value of 0.05 since the reported value was 0.730. This implied that the error term was homoscedastic and thus did not violate OLS assumptions. These results are presented in Table 4 below.

**Table 4: White Heteroscedasticity Test**

F-statistic	2.486478	Probability	0.729919
Obs*R-squared	22.61135	Probability	0.666379

#### 4.3.4 Serial Correlation/Auto Correlation

Serial correlation tests were run in order to check for correlation of error terms across time periods. Serial/auto correlation is tested using the Breusch-Godfrey serial correlation LM test. The null hypothesis is that no first order serial /auto correlation exists. The p value of 0.065921 indicates that we do not reject the null hypothesis and conclude that serial correlation does not exist. This implies that it was not critical to include lagged variables to correct for autocorrelation. These results are presented in Table 5 below;

**Table 5: Breusch-Godfrey Serial Correlation LM Test**

F-statistic	3.159487	Probability	0.088714
Obs*R-squared	3.381781	Probability	0.065921

#### 4.4 Unit root test

Prior to testing for a causal relationship and co integration between the time series, the first step is to check the stationarity of the variables used in the model. The aim is to verify whether the series have a stationary trend, and, if non-stationary, to establish orders of integration. The study used both Augmented Dickey-Fuller (ADF) test to test for stationarity. The test results of the unit roots (intercept only) are presented next; Results in table 6 indicated that GDP, exports and imports were non-stationary while FDI was stationary (i.e. presence of unit roots) at 5% and 10% levels of significance. This calls for first differencing of the non-stationary variables.

**Table 6: Unit root tests-Level**

Variable name	ADF test	1% Level	5% Level	10% Level	Comment
GDP	1.076028	-4.2826	-3.5614	-3.2138	Non Stationary
Exports	0.532554	-4.2826	-3.5614	-3.2138	Non Stationary
FDI	-3.738254	-4.3552	-3.5943	-3.2321	Stationary
Imports	0.150258	-4.2826	-3.5614	-3.2138	Non Stationary

Table 7 shows the Unit root results after differencing. This implies that GDP became stationary on second difference while exports, FDI and imports became stationary on first difference.

**Table 7: Unit root tests After Differencing**

Variable name	ADF test	1% Level	5% Level	10% Level	Comment
GDP	-7.368458	-4.3082	-3.5731	-3.2203	Stationary (2)
Exports	-4.864882	-4.2949	-3.5670	-3.2169	Stationary (1)
FDI	-5.720956	-4.3738	-3.6027	-3.2367	Stationary (1)
Imports	-4.371325	-4.2949	-3.5670	-3.2169	Stationary (1)

#### 4.6 Co-integration Tests

Then stationarity of the lagged residual was tested using ADF. The two step Engle Granger test of Co-integration results in Table 8 indicate that the lagged residual is stationary (i.e. has no unit roots) at 1%, 5% and 10% levels. This implies that all the variables in the model estimating GDP do converge to an equilibrium in the long run (i.e. are co-integrated).

**Table 8: Engle-Granger Co-Integration test**

Variable	ADF TEST	1%	5%	10%
Lagged residual	-2.817372	-2.6603	-1.9552	-1.6228

#### 4.7 Johansen Cointegration Test

The Johansen Cointegration test was also conducted since it is more accurate and superior to Engle granger test of Cointegration. Johansen results in table 9 indicate that the null hypothesis of at most 1 Cointegration equations for the model linking GDP to its determinants was rejected at 5% significance level. The likelihood ratio statistic for the null hypothesis of the existence of at most 1 Cointegration equations was larger than the z critical vales at 5% level. This implies that 2 co integrating equation exists. This further implies that all the variables in the GDP model converge to an equilibrium in the long run (i.e. are cointegrated).

**Table 9: Johansen Cointegration test**

Date: 09/10/14 Time: 15:25

Sample: 1980 2012

Included observations: 24

Test assumption:  
Linear deterministic  
trend in the data

Series: GDP EXPORTS FDI IMPORTS

Lags interval: 1 to 3

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.836048	90.69879	62.99	70.05	None **
0.693905	47.30244	42.44	48.45	At most 1 *
0.485650	18.88980	25.32	30.45	At most 2
0.115049	2.933344	12.25	16.26	At most 3

\*(\*\*) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 2 cointegrating equation(s) at 5% significance level

*4.8 Discussion of the Long Run Model Results*

The long run results presented in table 10 are generated from the non-stationary variables. The model r squared was 0.9584. This implied that the goodness of fit of the model explained 95.84% of the variation in GDP was explained by the independent variables. The overall model was significant as demonstrated by an F statistic of 184.235 (p value= 0.000). This further implied that the independent variables were good joint good predictors of the GDP.

The results in table 10 indicate that in the long run, FDI has a positive and insignificant relationship with GDP. (The FDI coefficient reported is 5.754243 and its P-value 0.4910). This implies that an increase or decrease in FDI has no effect on GDP.

The results in the table 10 also indicate that in the long run, Imports (IMPORTS) has a positive and significant relationship with GDP. (The imports coefficient reported is 1.316711 and its P-value 0.0000). This implies that an increase in imports by one unit leads to an increase in GDP by 1.316711 units.

Further, the results in the table 10 also indicate that in the long run, Exports (EXPORTS) has a positive and significant relationship with GDP. (The exports coefficient reported is 2.959009 and its P-value 0.0002). This implies that an increase in exports by one unit leads to an increase in GDP by 2.959009 units.

**Table 10: Long Run Model**

Dependent Variable: GDP

Method: Least Squares

Date: 09/10/14 Time: 08:36

Sample(adjusted): 1980 2012

Included observations: 28 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	5.754243	8.227008	0.699433	0.4910
IMPORTS	1.316711	0.137040	9.608226	0.0000
EXPORTS	2.959009	0.688627	4.296972	0.0002
C	4.20E+08	46852413	8.972556	0.0000
R-squared	0.958384	Mean dependent var		1.20E+09
Adjusted R-squared	0.953182	S.D. dependent var		4.46E+08
S.E. of regression	96606128	Akaike info criterion		39.74175
Sum squared resid	2.24E+17	Schwarz criterion		39.93206
Log likelihood	-552.3844	F-statistic		184.2351
Durbin-Watson stat	1.227421	Prob(F-statistic)		0.000000

**Long-run Model Equation**

$$\text{GDP} = 420,000,000 + 2.96 \text{ Exports} + 5.75 \text{ FDI} + 1.32 \text{ Imports} \dots \text{Eq. (1)}$$

*4.9 Discussion of the Error Correction Model Results*

Since the variables in the model are cointegrated, and then an error-correction model can be specified to link the short-run and the long-run relationships. Residuals from the cointegrating regression are used to generate an error correction term (lagged residuals) which is then inserted into the short-run model. The specific lagged residual term is LAGRESIDUAL. The estimates of the error-correction model are given in table 11.

Results revealed that the short run exports have a positive but insignificant relationship with short run GDP. A regression coefficient of 1.6984 (p-value=0.1798) implies that an increase in short run exports by one unit has no effect on the short run GDP.

Results revealed that the short run FDI have a positive but insignificant relationship with short run GDP. A regression coefficient of 2.613738 (p-value=0.8645) implies that an increase in short run FDI by one unit has no effect on the short run GDP.

Results revealed that the short run imports have a positive and significant relationship with short run GDP. A regression coefficient of 1.637040 (p-value=0.0026) implies that an increase in short run imports by one unit leads to a increase in short run GDP by 1.64 units.

The error correction term measures the speed of adjustment to the long run equilibrium in the dynamic model. The error correction term LAGRESIDUAL has the expected sign and is significantly negative (-0.675584, p value =0.1295). This result implies that there is a negative gradual adjustment (convergence) to the long run equilibrium. The coefficient of (0.675584) indicates that 67.56% of the disequilibria in short run GDP achieved in one period are corrected in the subsequent period. The other short-run variables however were insignificant.

**Table 11: Error Correction Model/ Short-Run Model**

Dependent Variable: DDGDP

Method: Least Squares

Date: 09/10/14 Time: 16:22

Sample(adjusted): 1986 2012

Included observations: 27 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DEXPORTS	1.698400	1.225919	1.385409	0.1798
FDI	2.613738	15.13482	0.172697	0.8645
DIMPORTS	1.637040	0.481279	3.401439	0.0026
LAGRESID	-0.678554	0.430801	-1.575099	0.1295
C	44394571	40624715	1.092797	0.2863
R-squared	0.452846	Mean dependent var		99663469
Adjusted R-squared	0.353364	S.D. dependent var		2.19E+08
S.E. of regression	1.76E+08	Akaike info criterion		40.97496
Sum squared resid	6.81E+17	Schwarz criterion		41.21493
Log likelihood	-548.1620	F-statistic		4.552015
Durbin-Watson stat	0.882330	Prob(F-statistic)		0.007870

## 5. CONCLUSIONS AND RECOMMENDATION

### 5.1 Conclusions

It was concluded that there was co-integration in the long run exports and imports. Results also indicated that in the long run, exports and imports had a positive and significant relationship with the long-run GDP. Therefore, an increase in exports and imports resulted to an increase in GDP. There was also the case of the short run imports which exhibited a positive and significant relationship with the short-run GDP and thus the conclusion that both the short-run as well as the long-run variations in GDP was due to the variations of long-run exports and both the short-run and long-run imports.

### 5.2 Recommendations

The study gave three recommendations based on the study objectives. First given that the relationship between exports and GDP was positive and significant, it is recommended that the EAC

---

countries should adopt export diversification strategy in a bid to increase aggregate economic growth. Second, given that the relationship between imports and GDP was positive and significant, it is recommended that the EAC countries should encourage intra-African regional trade since increase in the volume of trade results to increase in the aggregate GDP.

### *5.3 Areas of Further Studies*

The study has investigated the impact of intra-African regional trade on economic growth in EAC. The study therefore recommends that further research should be done on impact of intra-African regional trade on economic growth in other East and Central Africa. This is because the economies of this countries differ and thus allowing for comparison.

Research can also be carried out to identify other factors which may affect intra-African regional trade in EAC. Such findings can enlighten the governments of the various countries on the appropriate policies to formulate so as to foster the trade.

**REFERENCES**

- [1] Ades, F. & Glaeser, E. (1999). Evidence on Growth, Increasing Returns and the Extent of the Market. *Quarterly Journal of Economics*, Vol. 114(3): 1025-1045.
- [2] Alcalá, F. & Ciccone, A. (2003). Trade, Extent of the Market, and Economic Growth 1960-1996, Research Paper, University of Murcia
- [3] Amanja, D. & Morrissey, O. (2005). *Fiscal Policy and Economic Growth in Kenya*, Credit Research Paper 5/6
- [4] Barro, R. & Sala-i-Martin, X. (1995). *Economic Growth*. New York: McGraw-Hill.
- [5] Borenztein, E, Gregorio, J, & Lee, W. (1998). How does foreign direct investment affect Economic Growth? *Journal of International Economics*, Vol. 45 no. 1, pp 115-135
- [6] De Vaus, D. A. (2001). *Research Design in Social Research*. SAGE.
- [7] Khaguli, E. (2013). *Factors Affecting Trade Facilitation in East Africa and their Impact on Kenya/Uganda/Tanzania/Rwanda/Burundi Border Points*. Unpublished Master's Thesis
- [8] Mankiw, N. (1992). A Contribution to the Empirics of Economic Growth. *The Quarterly Journal of Economics*, 107 (2), pp 408-437
- [9] Mugenda, O. M. & Mugenda, A.G. (2003). *Research Methods: Quantitative and Qualitative Approaches*, Acts Press, Nairobi-Kenya
- [10] Ngeny, K. (2013). *Impact of Foreign Direct Investment Volatility on Economic Growth in Kenya*. Unpublished Master's Thesis
- [11] Orodho J.A. (2008). *Elements of Education and Social Science Research Methods*. Kanezja Publishers.
- [12] Otinga, H. (2009). *The Impact of International Trade on Economic Growth in Developing Countries (Exports for Rapid Economic Growth): A Case Study of Kenya*. Unpublished Master's Thesis
- [13] Romer, P. (1986). Increasing Returns and Long-Run Growth, *Journal of Political Economy* 94, (5), pp. 1002-1037
- [14] Sanda, B. (2011). *Impact of Foreign Aid on Economic Growth in Kenya*. Unpublished Master's Thesis
- [15] Solow, R. (1956). A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics*, 70, pp 65-94.
- [16] Vamvakidis, A. (1998). *Regional Integration and Economic Growth*, The World Bank
- [17] Vickers, J. & Yarrow, G. (1991). Economic Perspectives on Privatization, *The Journal of Economic Perspective* 5, (2), pp. 111-132

**ABBREVIATIONS AND ACCRONYMS**

<b>CBK</b>	Central Bank of Kenya
<b>CEPII</b>	Centre d' Etudes Prospectives Informations
<b>CET</b>	Common External Tariff
<b>EAC</b>	East Africa Community
<b>FDI</b>	Foreign Direct Investment
<b>GDP</b>	Gross Domestic Product
<b>IMF</b>	International Monetary Fund
<b>KNBS</b>	Kenya National Bureau of Statistics
<b>NTB</b>	Non Tariff Barriers
<b>OLS</b>	Ordinal Least Squares
<b>SPSS</b>	Statistical Package for Social Sciences
<b>WTO</b>	World Trade Organization

**DEFINITION OF OPERATIONAL TERMS**

**Intra- African Trade** – this is trade among the countries within Africa.

**Economic Growth** - is the increase in the market value of the goods and services produced by an economy over time. It is conventionally measured as the percent rate of increase in real gross domestic product, or real GDP. Of more importance is the growth of the ratio of GDP to population (GDP per capita), which is also called per capita income. An increase in growth caused by more efficient use of inputs is referred to as intensive growth. GDP growth caused only by increases in inputs such as capital, population or territory is called extensive growth.