The Moderating Effect of Economic Growth on the Relationship between Economic Integration and Foreign Direct Investment in the East African Community

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Abstract

This paper investigates the moderating effect of economic growth on the relationship between economic integration and foreign direct investment in the East African Community. Developing countries rely on foreign direct investment (FDI) to supplement their low levels of national savings in order to promote economic development. However, low levels of FDI are still a big concern for poor countries. Regional integration is often considered a means to improve member countries' attractiveness to FDI. From the available anecdotal evidence, the East African region ranks as one of the poorest recipients of FDI in the world. Finance literature records that economic growth as an indicator of the investor potential rate of return as well as population purchasing power catalyzes the rate of foreign direct investment attraction. The research employed an explanatory research design. East African Community was the unit of analysis involving Kenya, Tanzania, Uganda, Rwanda and Burundi. Empirical data analysis employed hierarchical regression analysis. The quarterly time series data used spanned the period 2001 – 2015. The study establishes that economic growth enhances the capacity of economic integration to attract FDI into a region.

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1 Introduction

Economic integration can be defined as a reduction of trade barriers and investment restrictions among countries (Blomstrom & Kokko, 1997).The levels of economic integration are usually identified as the free trade area, the customs union, the common market, the economic union, monetary union and complete economic integration. The free trade area involves the abolition of tariffs and equivalent trade restrictions between members of the area, with each member selecting its own trade policy for non-members. The customs union is a free trade area with a common trade policy with respect to non-members. The common market has all the elements of the customs union, and additionally, permits factors of production like capital and labour to move freely among member nations. An economic union is a common market in which members coordinate national economic policies. A monetary union is where more than one territory share a common currency and foreign exchange policy. Finally, complete economic integration is an economic union for which a supranational agency determines monetary, fiscal, trade, and social policies for all member nations.

In the recent past there has been an escalation of Regional Integration Agreements (RIAs). According to the World Trade Organisation (2016), as at the beginning of the year 2016 we had 423 active regional trade agreements. These developments have renewed interest in the economics of regional integration, first raised by Viner (1950). According to various theoretical concepts, economic integration should influence FDI flows mostly positively, due to reduced trade barriers and extended market sizes (Marszk, 2014). Medvedev (2012) argued that creation of an economic bloc leads to increased market size, which in turn influences the magnitude of FDI flows.

Foreign direct investment is a category of cross-border investments made by a resident in one economy with the objective of establishing a lasting interest in an enterprise that is resident in an economy other than that of the direct investor. The "lasting interest" is evidenced when the direct investor owns at least 10% of the voting power to gain access to the economy of the direct investment enterprise which it might otherwise be unable to do. Direct investment enterprises are corporations, which may either be subsidiaries, in which over 50% of the voting power is held, or associates, in which between 10% to 50% of the voting power is held, or they may be quasi-corporations such as branches which are effectively 100% owned by their respective parents (OECD, 2008).

The International Monetary Fund (IMF) (1993) recommends using 10% as the basic dividing line between direct investment and portfolio investment in the form of shareholdings. For instance, if a non-resident who previously had no equity in a resident enterprise purchase 10% or more of the shares of that enterprise from a resident, the value of equity holdings acquired should be recorded as direct investment. From this moment, any further capital transactions between these two

companies should be recorded as a direct investment. When a non-resident holds less than 10% of the shares of an enterprise as portfolio investment, and subsequently acquires additional shares resulting in a direct investment (10% or more), only the purchase of additional shares is recorded as direct investment in the Balance of Payments.

The methods of increasing international business extend from the relatively simple approach of international trade (export and import of goods and services) to the more complex approach of acquiring foreign firms or establishing new subsidiaries (Greenfields). Any method of increasing international business that requires a direct investment in foreign operations is referred to as a foreign direct investment (FDI). International trade and licensing usually are not considered to be FDI because they do not involve direct investment in foreign operations. Franchising and joint ventures tend to require some investment in foreign operations, but to a limited degree. Foreign acquisitions and the establishment of new foreign subsidiaries (Greenfields) require substantial investment in foreign operations and represent the largest portion of FDI (Madura, 2008).

Foreign direct investment is usually captured in the balance of payment statement as a distinct item. This study will be interested in measuring the stocks of FDI at a particular time as opposed to the FDI inflows. Foreign direct investment stock refers to the difference between FDI inflows and outflows at a particular point in time. In other words FDI stock refers to the net FDI flows (Athukorola, 2013).

Regional trade agreements (RTAs) have an influence on FDI through their effects on market size and GDP. Expanding regional markets emerge as one of the most important factors influencing the location of foreign investments. Regional trade agreements through trade liberalisation, combine fragmented markets into a single large one and generally increase the growth rate of member countries' GDP (Gomez-Mera, 2015).

Economic growth has generally been accepted as a major objective of national policy. Economic growth means growth of national output. The output of an economy consists of a quantum of goods and services, and economic growth occurs as this quantum increases. The economic growth rate is measured using the real Gross Domestic Product (GDP) (Soubbotina & Sherem, 2000). A country's economic growth is usually indicated by an increase in that country's gross domestic product, or GDP.

Researchers consistently use GDP, GDP growth, GDP per capita and/or other variants of GDP as determinants of FDI. Gross domestic product measures the monetary value of final goods and services—that is, those that are bought by the final user—produced in a country in a given period of time (say a quarter or a year). It counts all the output generated within the borders of a country. It is composed of goods and services produced for sale in the market and also include

some nonmarket production, such as defence or education services provided by the government. Per capita GDP shows how big each person's share of GDP would be if we were to divide the total into equal portions. Gross Domestic Product growth rate is an indication of the potential return on investment to be reaped by an investor.

Foreign capital inflows play a critical role in sustaining higher levels of investment and growth in developing countries, given their persistently low national savings rate (Mottaleb & Kalirajan, 2010). Hence, foreign direct investment (FDI) is being sought by all developing countries as a means of complementing the levels of domestic investment (Dabour, 2000). According to UNCTAD (2010) FDI accounts for 11 percent of global Gross Domestic Product (GDP) and more than 80 million jobs worldwide. Policymakers in developing countries know that foreign direct investment (FDI) is needed to boost the growth in their economies. To this end, governments have considered various incentives and policies to attract FDI (United Nations, 2005).

Alongside the different policy options, developing countries view regional economic integration as an important ingredient in stimulating increased FDI (Africa Development Bank, 2011). However, the performance of developing countries in attracting FDI has been dismal. Specifically, Africa has never been a major recipient of FDI and lags behind other regions of the world (Dupasquier & Osakwe, 2005). For instance according to UNCTAD (2015) between the years 2012 – 2014 the entire Africa continent received a paltry less than 5% of the global FDI inflows over that period. Within the wider Africa, the East African region ranks as the poorest performer in the attraction of FDI (African Development Bank, 2011). More recently the *EY's attractiveness survey* of 2015 indicated that in the year 2014, FDI projects in the East Africa region went down by 17%. This is despite the fact that within this region there is a regional economic bloc known as the East African Community (EAC). The current EAC was established in the year 2000 and attained common market status by the end of 2015. However, according to the African Development bank (2012) significant trade barriers still persist in the EAC. According to Slavica & Andreja (2014) one of the most prominent weakness inhibiting FDI inflows in EAC are: small domestic market with low per capita income, high country risk, slow progress in structural and institutional reforms, high administrative barriers, inefficient government bureaucracy, high level of corruption, and poor implementation of laws.

2 The East African Community

The context of this study was the East African Community (EAC) member countries. EAC is a regional intergovernmental organization of the Republics of

Kenya, Uganda, Tanzania, Rwanda Burundi and South Sudan with headquarters in Arusha, Tanzania. It is among the rising number of regional trade organizations in Africa, whose partner states conduct business activities at the bilateral and multilateral levels. The original EAC was founded in 1967 but collapsed in 1977 as a result of weak organizational structures as well as political differences between the then founding partner states of Kenya, Uganda and Tanzania.

It was officially revived in 2000, following the signing of the Treaty for the Establishment of the East African Community in 1999 by the 3 partner states. The Republics of Rwanda and Burundi became full members of the EAC after acceding to the treaty in 2007. The Protocol on the Establishment of the EAC Customs Union (the Customs Union Protocol) was signed by the 3 East African Heads of state on 2nd March 2004 and came into effect on 1st January 2005 (Institute of Economic Affairs, 2011).

The EAC is home to 158 million citizens, of which 22% live in urban areas. The region has a land area of 2.42 million square kilometers and a combined Gross Domestic Product of US\$ 169.5 billion. Agriculture is at the core of economic developments in the EAC. It accounts for 43% of the total GDP in the region. Agricultural share of GDP exceeds 50% in Tanzania and Burundi, while in Uganda and Rwanda it is about 50%, and in Kenya it contributes less than 30% (Kabuye, 2008).The key export products from EAC include coffee, tea, cocoa, iron, steel, crude oil & petroleum products, cement, mineral ores, palm oil, sugar, horticulture and fertilizer. Under the U.S. African Growth and Opportunity Act (AGOA), EAC countries benefitted from duty-free and quota-free access to the U.S. market for a range of products until 2015(EAC Statistics for 2015).

3 Related Literature

The impact of economic growth on FDI has been a source of interest for decades. The literature contains rival theoretical predictions and much conflicting evidence. Iamsiraroj & Doucouliagos (2015) presented a comprehensive assessment of the accumulated evidence on the success of economic growth in attracting FDI. The aim of the study was to identify the significance and the strength of the impact of economic growth in a host country on FDI inflows and to identify the impact of specification differences on the reported economic growth-FDI effects. Meta-regression analysis was applied to 946 estimates from 140 empirical studies. The authors showed that there is a robust positive relationship between growth and FDI. It also appeared that growth was slightly more correlated with FDI in developing countries.

When the location determinants of FDI are discussed in the theoretical literature, market size and growth rate of host economies are treated as the two most

prominent factors (Li and Liu, 2005). Many empirical studies find that economic growth is an incentive for FDI inflows (Dermirham and Masca, 2008). There are several reasons why foreign investors might prefer faster growing markets. For example, cost efficiency of production and the realization of economies of scale and scope in the production are closely linked with the market size (Katerina, 2004). Growth is a measure and signal of market demand and market demand attracts FDI.

According to Iamsiraroj and Doucouliagos (2015), a higher rate of economic growth signals the potential market, which could be expanded in the future. Economic growth motivates foreign firms to plan new projects or new production facilities. Regions that are experiencing rapid economic growth are also generating more profitable opportunities, and they give the promise of growing markets and growing profits.

According to Stein and Daude (2001) the flow of FDI between countries is explained by the economic size (GDP) of the host country. This argument is supported by multiple studies (Ismail et al., 2009; Iamsiraroj and Doucouliagos, 2015; Chien & Zhang, 2012). Therefore, it is correct to state that economic integration is not a sufficient condition for attraction of FDI. The potential investors would also consider market size and the population purchasing power as indicated by the GDP.

The relationship between economic growth and foreign direct investment was investigated by Abala (2014). The study hypothesized that FDI is important for economic growth as it provides much needed capital, increases competition in host countries and helps local firms to become more productive by adopting more efficient technology. The study employed a multiple regression model. The results showed that foreign direct investment has led to economic growth in Kenya. Other drivers of economic growth identified in this study included inflation, government size, human capital and openness of the economy. This study did not test for the possibility of reverse causality between economic growth and FDI.

After empirically investigating the determinants of foreign direct investment in Pakistan Ali khan & Nawaz (2010) found the co-efficient of GDP growth rate positive, confirming their hypothesis that higher economic growth rate is associated with greater inflow of FDI. The evidence suggested that foreign investors invest in search of new market opportunities. A large market size provides more opportunities for sale and profit. Countries with better growth prospects symbolized by GDP growth rate took greater inflows of FDI than volatile economies.

Further evidence about the role of economic growth in the attraction of FDI is provided by Dermirham & Masca (2008) who investigated by using a cross-

sectional econometric model, the determinants of foreign direct investment (FDI) inflows in developing countries over the period of 2000-2004. The study was based on a sample of cross-sectional data on 38 developing countries. In the models, dependent variable was FDI. Independent variables were growth rate of per capita GDP, inflation rate, telephone main lines per 1,000 people measured in logs (this was a proxy for communication infrastructure), labor cost per worker in manufacturing industry measured in logs, degree of openness, risk and corporate tax rate. According to the econometric results, in the main model, growth rate of per capita, telephone main lines and degree of openness had positive sign and were statistically significant.

Another study on the role of GDP in the attraction of FDI was conducted by Mateev (2008) who examined the major determinants of foreign direct investment (FDI) flows in the Central and South-eastern European countries. Using an econometric model based on cross-section panel data analysis the study found out that both gravity factors (distance, population, and GDP) and non-gravity, or transition-specific factors (risk, labour costs, and corruption) can explain, to a large extent, the size of FDI flows in transition economies. The evidence about the role of privatization in explaining the scale of inward investment was ambiguous.

Using a panel dataset of bilateral flows of foreign direct investment (FDI) between 1994 and 2000, Beavan and Estrin (2004) investigated the determinants of FDI from Western countries, mainly in the European, to Central and Eastern European ones. The study focused on the following factors: proximity, concentration advantages, and factor costs. A Regression model was employed in the study. They found the most important influences to be unit labour costs, gravity factors, market size, and proximity. FDI is related positively to both source and host country GDP and related inversely to the distance between the countries and to unit costs. Hence investment to the region has been both market seeking and efficiency seeking. Integration with EU was found to be important for FDI in transition economies.

The potential rate of return in an economy as indicated by economic performance is considered an important determinant of FDI. Asiedu (2002) examined whether factors that affect FDI in developing countries affect countries in Sub-Saharan Africa differently. The multiple regression results indicated that: a higher return on investment and better infrastructure have a positive impact on FDI to non-sub-Saharan Africa countries, but have no significant impact on FDI to sub-Saharan Africa; openness to trade promotes FDI to sub-Saharan African and non-sub-Saharan African countries; however, the marginal benefit from increased openness is less for sub-Saharan Africa.

The role of country income differences in the determination of FDI was investigated by Zarzoso &Lehmann (2003) who applied the gravity trade model to assess Mercosur-European Union trade, and trade potential following the

agreements reached between both trade blocs. The model was tested for a sample of 20 countries, the four formal members of Mercosur plus Chile and fifteen members of the European Union. A panel data analysis was used to disentangle the time variant country-specific effects and to capture the relationships between the relevant variables over time. The results showed that the fixed effect model is to be preferred to the random effects gravity model. Furthermore, a number of variables, namely, infrastructure, income differences (as measured using GDP Per Capita) and exchange rates added to the standard gravity equation, were found to be important determinants of bilateral trade flows.

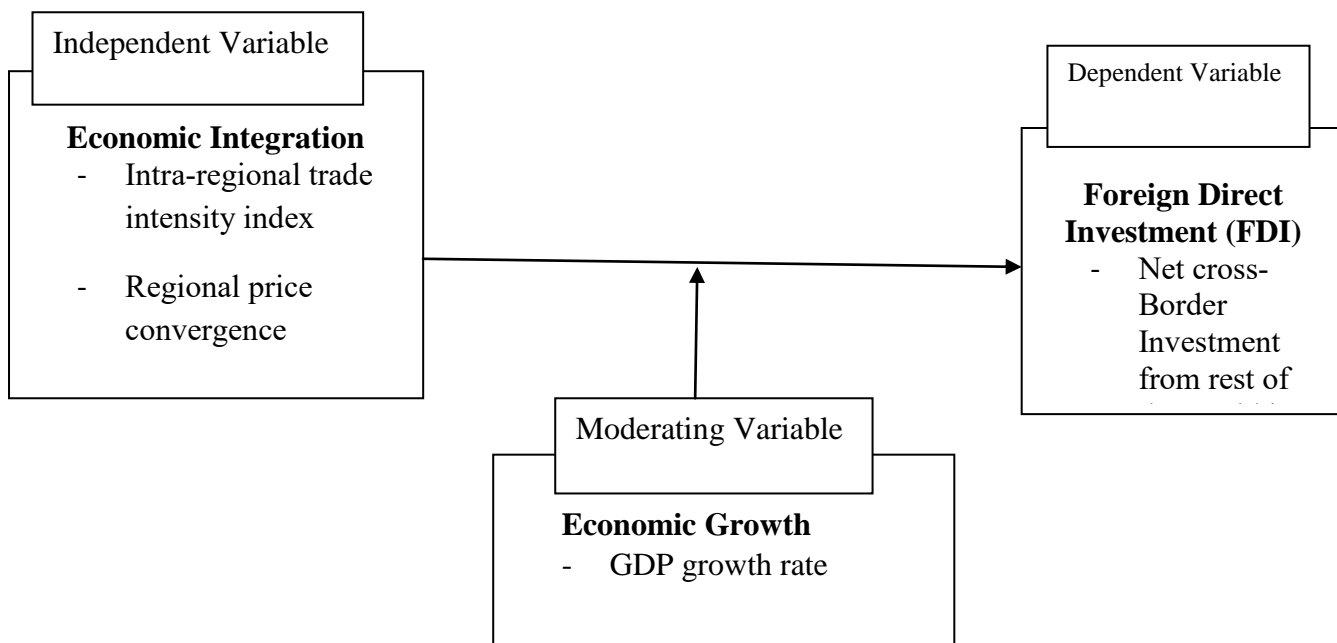## 4 Conceptual Framework and Variable Operationalization

Figure 1: Conceptual Framework
Source: Author (2016)

Foreign direct investment (FDI) refers to all net capital flows between countries. This study was interested in measuring the stocks of FDI at a particular time as opposed to the gross FDI inflows. This refers to the difference between FDI inflows and outflows at a particular point in time (Athukorola, 2013).

Economic integration was measured using intra-regional trade intensity index and regional price convergence. The extent of integration is typically observed in bilateral trade of countries (Kodongo and Natto, 2014). Trade volume is an all-

encompassing variable that is responsive to changes over time in the progress of regional integration (Krieger-Boden & Soltwedel, 2010).Trade and investment are twin flows (Segre, 2000), hence an expected positive coefficient. Intra-regional trade intensity index is the ratio of intra-regional trade share to the share of world trade with the region. It determines whether trade within the region is greater or smaller than should be expected on the basis of the region's importance in world trade. An index of more than one indicates that trade flow within the region is larger than expected given the importance of the region in world trade.

Regional price convergence (σ-convergence) means that the variance of prices within a group of countries becomes smaller (Barro & Sala i Martin, 1995). The Law of One Price (LOOP) states that a product must sell for the same price in all locations of the integrated market. Engel and Rogers (2001) measured price convergence between US cities using dispersion of inflation. The lower the inflation variance, the more integrated the market. Economic growth was treated as a moderating variable. Higher economic growth rate is associated with greater inflow of FDI (Iamsiraroj & Doucouliagos, 2015; Ali khan and Nawaz, 2010; Dermirham & Masca, 2008), hence the coefficient is expected to be positive.

Table 1: Measurement/Operationalization of variables

	Independent variable		
Variable	**Indicator(s)**	**Operational definition**	**Sources**
Economic integration	Intra-regional trade intensity index	[Xii / (Xi)] / [Xi)/Xw}], where Xii is export of region i to region i plus imports of region i to region i, Xi is total exports of region i to the world plus total imports of region i from world, Xw is total world exports and imports	(Dreger *et al.*, 2007).
	Regional price convergence	Inflation variance among the member countries	Barro & Sala i Martin, (1995).;Engel and Rogers (2001)
Dependent variable			
Foreign Direct Investment(FDI)	FDI stock	Difference between FDI inflows and outflows at a particular point in time	Athukorola (2013)
Moderating Variable			
Economic Growth	GDP growth rate	EAC average GDP growth rate	Iamsiraroj and Doucouliagos, (2015); Ali khan and Nawaz, (2010); Dermirham and Masca, (2008)

5 Methodology and Data

A moderator is a variable that specifies conditions under which a given predictor is related to an outcome. It explains when an independent and dependent variables are related. The moderating effect could be (a) enhancing, when increasing the moderator would increase the effect of the predictor on the outcome; (b) buffering, where increasing the moderator would decrease the effect of the predictor on the outcome; or (c) antagonistic, where increasing the moderator would reverse the effect of the predictor on the outcome.

The Moderation effect of economic growth on relationship between economic integration and FDI was tested using a hierarchical regression model. Writing about moderating and mediating effects in causal models, Kim *et al* (2001) noted that when the independent and moderator variables are continuous, their interaction can be estimated using the following functional form:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 X_2 + \varepsilon$$

The change in slope of Y on X_1, given a unit change in X_2, is represented by β_3. The interpretation of β_3 is symmetric, in that it also represents the change in slope of Y on X_2, given a unit change in X_1. Since product $X_1 X_2$ is often highly correlated with X_1 and X_2, as when both X_1 and X_2 take on only positive values. The possible multicollinearity problem is typically addressed by rescaling X_1 and X_2 such that they are centered near zero (this is often accomplished by centering X_1 and X_2 at their means).

The following two sets of regression model were used in measuring the moderating effect of GDP. The reason for having two sets of equations is because the independent variable (economic integration) was measured using two distinct indicators for which computation of a composite measure was not tenable.

The following model uses intra-regional trade intensity as the measure of economic integration.

$$\ln FDI_t = \beta_0 + \beta_1 \ln IT_t + \beta_2 \ln GDP_t + \beta_3 (\ln IT_t * \ln GDP_t) + \varepsilon$$

Where:
FDI = foreign direct investment
IT = intra-regional trade intensity index
GDP = Gross Domestic Product
$\ln IT_t * \ln GDP_t$ = interaction term
The interaction term shows the effect of economic integration (IT) on FDI given a unit increase in GDP. A change in R^2 implies that GDP plays a moderating role.

Another model was used to measure the moderation effect of GDP when economic integration is measured using regional price convergence. The model was specified as follows:

$$\ln FDI_t = \beta_0 + \beta_1 \ln PC_t + \beta_2 \ln GDP_t + \beta_3 (\ln PC_t * \ln GDP_t) + \varepsilon$$

Where:
FDI = foreign direct investment
PC = regional price convergence
GDP = Gross Domestic Product
$\ln PC_t * \ln GDP_t$ = interaction term
β_3, represents change in FDI due to economic integration given a unit change in GDP. The coefficient is attached to the interaction term. A positive value for the effect of interaction term would imply that the higher the GDP growth rate, the greater (more positive) the effect of economic integration on FDI. Similarly, the greater (more positive) the effect of GDP on FDI

The study relied purely on secondary data. This is because all the data of interest to this study is available in published form from different organizations. The historical data for the period 2001 - 2015 was sourced from tradingeconomics.com, EAC statistics portal, UNCTAD and World Bank records. Specifically, FDI data was sourced from UNCTAD and tradingeconomics.com, GDP data was obtained from the EAC statistics portal, African Development Bank and tradingeconomics.com, while the data on intra-regional trade was accessed from the IMF's Direction of Trade Statistics (DOTs) and tradingeconomics.com, the data to compute regional price convergence (that is, inflation variance data) was sourced from tradingeconomics.com, Most of the data published by these organizations is usually audited hence providing strong assurance of quality. The time series data used in the study spanned from years 2001 to 2015. Quarterly data was used in the study meaning that there were 60 data points. The current East Africa Community came into being in the year 2000.

6 Preliminary Analysis

6.1 Descriptive Statistics
Descriptive statistics were very important in this study because they enable presentation of the data in a manner which allows for simpler interpretation. These statistics forms the basis of every quantitative analysis of data in a study. Analysis was conducted on the data to establish the measures of central tendency (mean) and dispersion (standard deviation). The results also indicated the normality of the variables which was shown by the Jarque Bera characteristic. The null hypothesis is of normality, and rejection of the hypothesis (because of a significant p-value)

leads to the conclusion that the distribution from which the data came is non-normal. The results are indicated in Table 2.

Table 2: Descriptive Statistics Summary

	FDI	GDP	IT	PC
Mean	1,763.97	3.11	0.61	13.76
Median	1,422.98	3.14	0.47	9.41
Maximum	6,417.68	6.52	2.12	72.66
Minimum	274.63	(0.26)	0.27	0.62
Std. Dev.	1,446.69	1.37	0.36	13.67
Skewness	1.38	(0.06)	1.90	2.14
Kurtosis	4.51	3.28	7.21	8.32
Jarque Bera	24.76	0.22	80.34	116.72
Probability	0.000	0.89	0.000	0.000
Observations	60	60	60	60

Source: Author computation (2016)

Table 2 above gives a summary descriptive statistics of all the variables of the study. These variables include foreign direct investment (FDI) which is the dependent variable, the two measures of economic integration which is the independent variable namely regional price convergence (PC) and intra-regional trade intensity index (IT), and Gross domestic product (GDP) growth rate which is a moderating variable.

The mean FDI stock recorded over the study period was USD 1,763.97 million with a standard deviation of USD 1,422.98 million which indicated a large variation in the FDI stock over the study period. The highest FDI amount recorded in the study period was USD 6,417.68 million while the lowest amount was USD 274.63 million The Jarque Bera value was non-significant at 5% level of significance which led to rejection of the null hypothesis of normality. This implies that the FDI variable was not normally distributed.

The average GDP recorded over the study period was 3.11% with a standard deviation of 3.14% which indicate a large variation in GDP over the study period. The maximum GDP recorded over the study period was 6.52% while the minimum value was -0.26%. The Jarque Bera value was non- significant which led to failure to reject the null hypothesis of normality. Therefore, GDP data was normally distributed.

The intra-regional trade intensity index had an average value of 0.61 with a standard deviation of 0.36 indicating large variation in intra-regional trade intensity index. The largest intra-regional trade intensity index recorded over the

study period was 2.12 while the minimum was 0.27. Intra-regional trade intensity index had a significant Jarque Bera value which led to rejection of the null hypothesis of normality hence the conclusion that intra-regional trade index data was not normally distributed.

Regional price convergence had a mean value of 13.76 with a maximum value 72.66 and minimum value of 0.62. The standard deviation was 13.67 which indicated a large variation in regional price convergence quarterly. The Jarque Bera value was significant which led to rejection of the null hypothesis of normality implying that regional price convergence data was not normally distributed.

The results obtained in this section are very important for the subsequent analysis. For instance some data series were found not to be normally distributed. In section 7.3.3 a test about normality of the residuals is conducted before the data is entered in analytical models.This is essential in validating the model estimates.

6.2 Trend Analysis
Trend analysis in this study is very useful in identifying if trend patterns in the time series data exists. A trend usually exists as a result of long-term factors such as economic growth or decline, changes in FDI inflows, price stability, trade, corruption levels and so forth. For instance, a trend line would help show whether there has been a tendency towards price convergence within EAC over the years. The identification of fluctuations in a series can also make it easy to apply time series analysis techniques such as sequence similarity, pattern recognition and missing values prediction. Trends are also important in visually giving indications about stationarity or otherwise of the data series. Trend analysis can help a researcher to derive additional information from the numerical data. Trend lines helps people to understand time series data quickly. The trends can also be used to extrapolate future patterns.

This section presents the trend analysis of foreign direct investment, intra-regional trade intensity, regional price convergence, economic growth, openness to trade, ease of trade across borders, property rights, corruption and bureaucracy indices. Trend analysis is very useful for identifying patterns in time series data. In addition, visual observation of the trend could also give an indication about stationarity or otherwise of a series.

6.2.1 Trend Analysis for Foreign Direct Investment
The results in figure 2 indicate that the amount of foreign direct investment was increasing unsteadily over the study period. The lowest amount was recorded in the first quarter of the year 2001 while the highest amount was recorded in the second quarter of 2015. From the fourth quarter of 2012, the variation in the amount of foreign direct investment widened. Generally, the series shows

presence of an increasing trend of FDI stock over the years since the establishment of the EAC.
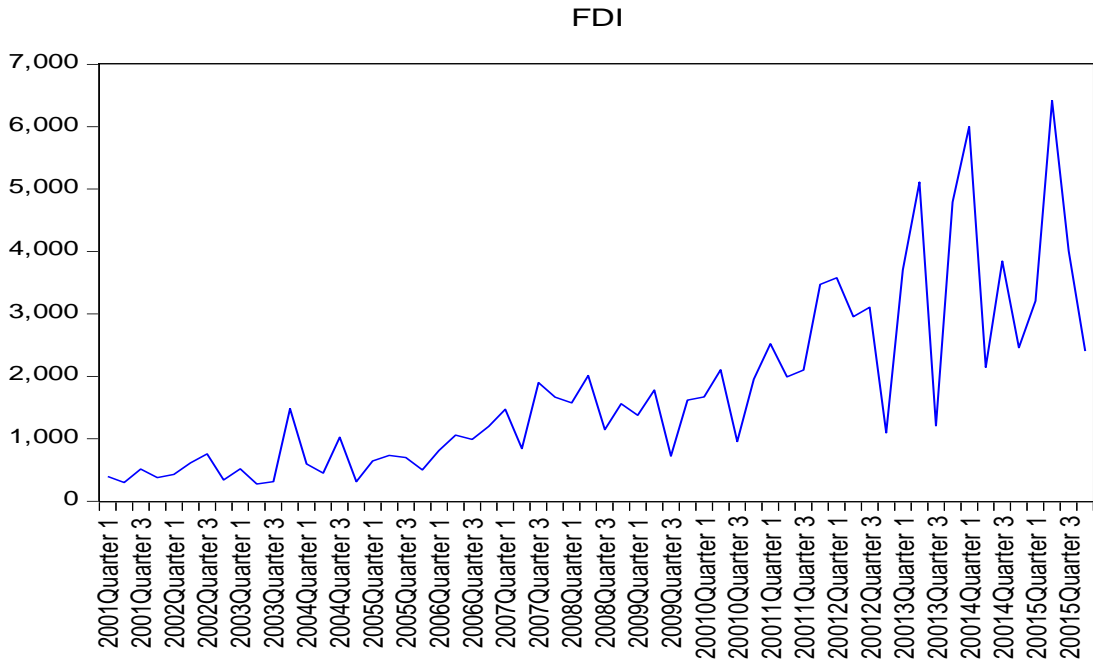

Figure 2: Trend Analysis for Foreign Direct Investment
Source: Author computation (2016)

6.2.2 Trend Analysis for Intra-regional Trade Intensity Index

The intra-regional trade intensity index value recorded over the study period indicated unsteady increasing trends. The figure indicates large moments of increasing trends followed by large moments of decreasing trends indicating non stationarity in the data. This is an indication of an absence of a trend. It shows that the growth of intra-regional trade in the EAC is yet to take a defined steady pattern.
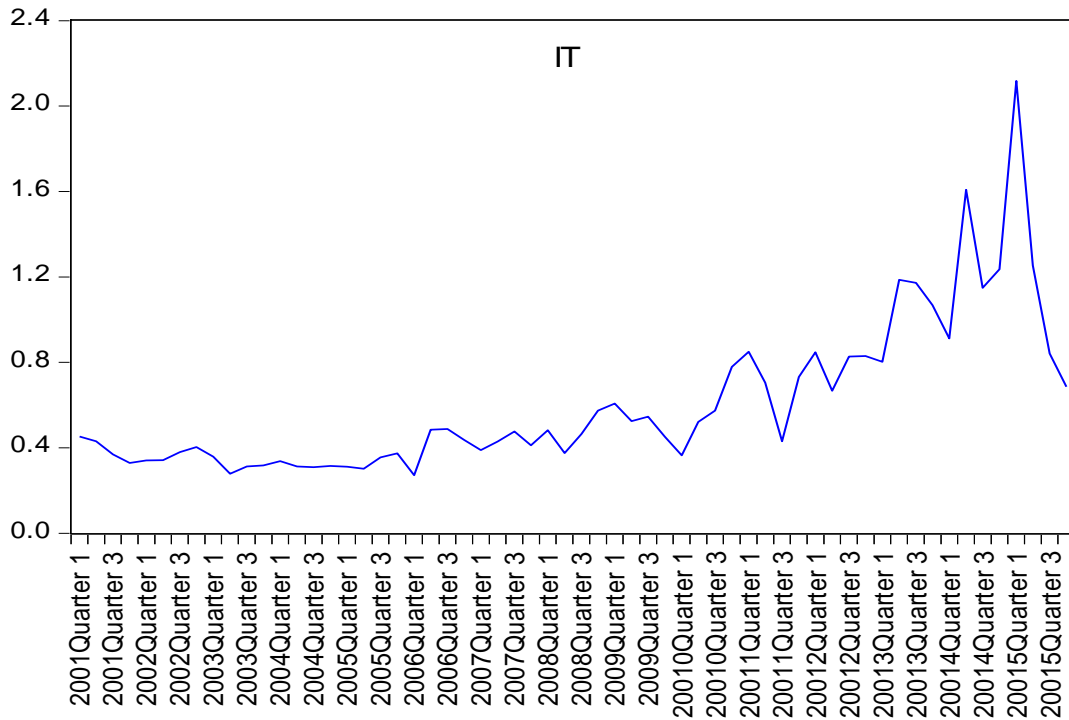
Figure 3: Trend Analysis for Intra-regional Trade Intensity Index
Source: Author computation (2016)

6.2.3 Trend Analysis for Regional price convergence

The regional price convergence recorded over the study period indicated steady increasing and decreasing trends with the highest value recorded in the year 2008 quarter three. The figure indicates short moments of increasing trends followed by short moments of decreasing trends indicating unpredictability hence an indication of stationarity in the data. The series also show some sharp peaks and troughs. More specifically, there are sharp peaks in the years 2002, 2006, 2008, and 2012. Most of these peaks correspond to the Kenya electoral cycle, the biggest economy in the region. This might possibly be explained by the general price increases during electoral seasons.
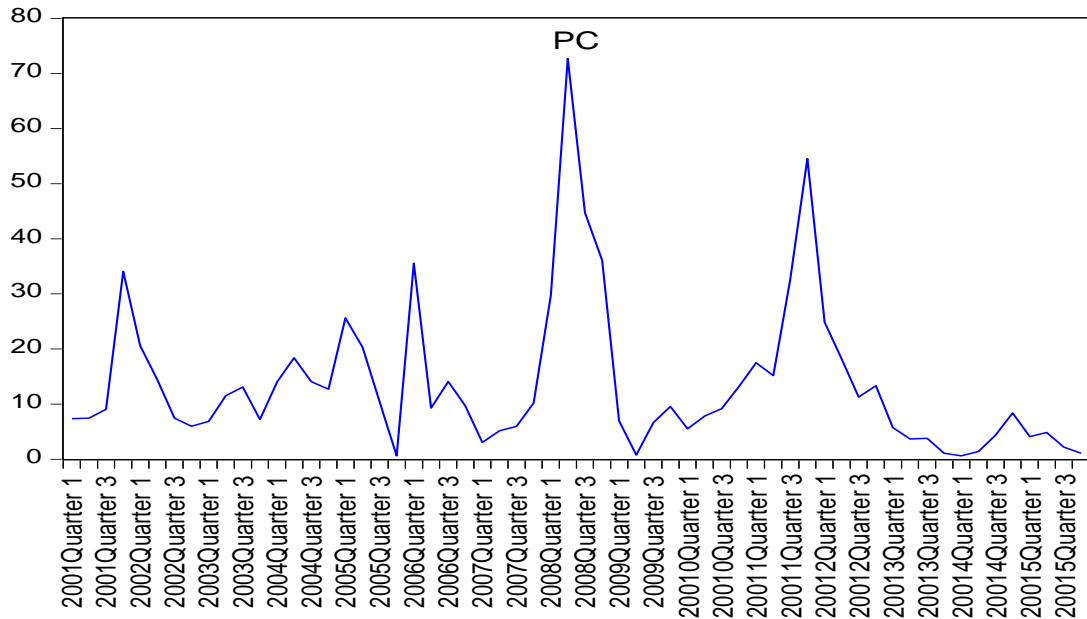
Figure 3a: Trend Analysis for Regional Price Convergence
Source: Author computation (2016)

The following figure 3b shows that over the years there has been a trend towards regional price convergence within the East Africa Community region. This can be seen from the negatively sloped trend line (tending towards zero) shown below. The R squared value of 0.107 indicates that in each quarter there is a 10.7% movement towards convergence.
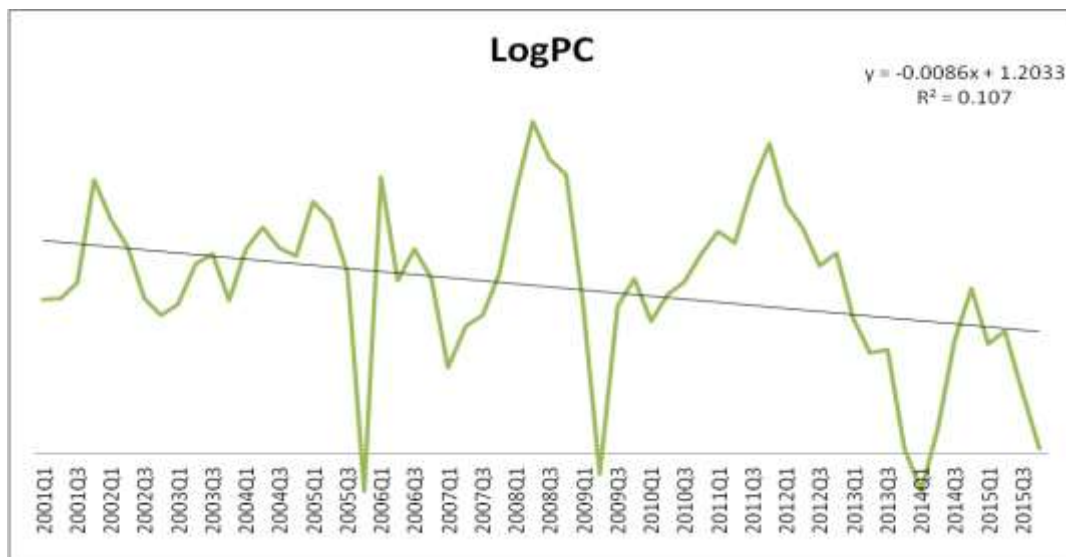

Figure 3b: Trend Line for Regional Price Convergence
Source: Author computation (2016)

6.3.4 Trend Analysis for Economic Growth (GDP)

The figure indicates steady trends in economic growth over the study period with the trends portraying unpredictable trends which are an indication of stationarity in the data on economic growth. The highest economic growth value recorded over the study period was in the year 2011 quarter three. The figure indicates steady trends in economic growth over the study period with the trends portraying unpredictable trends which are an indication of stationarity. Generally, there has been a trend of economic growth in EAC over the years.
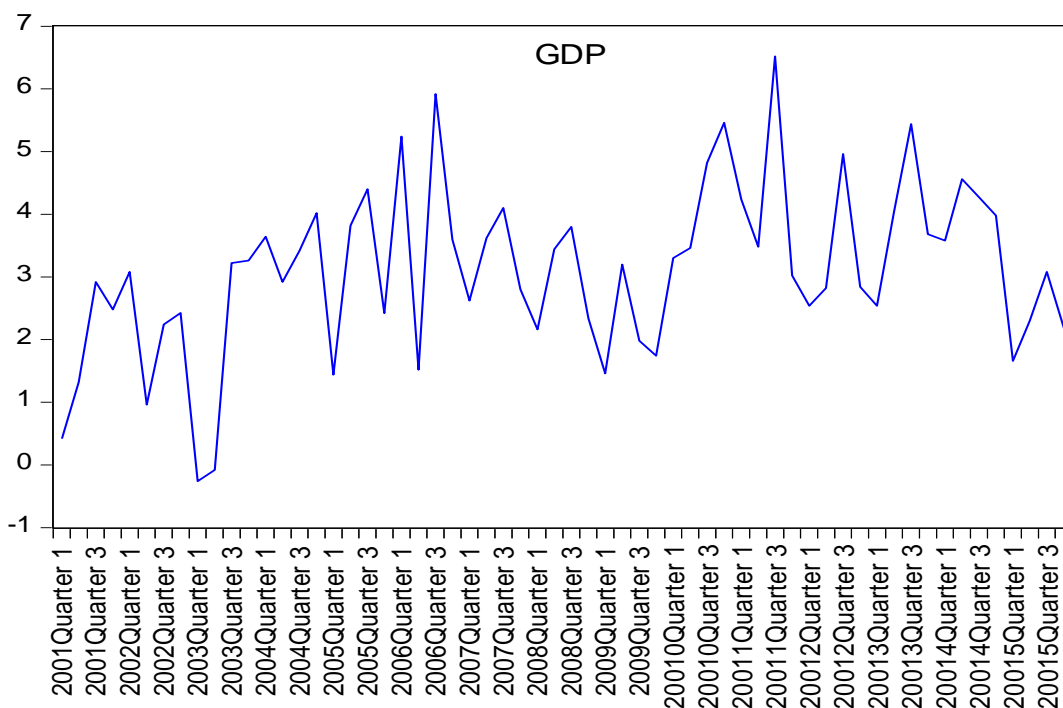

Figure 4: Trend Analysis for economic growth
Source: Author computation (2016)

6.3 Diagnostic Tests
6.3.1 Multicollinearity Test

Multicollinearity refers to the presence of correlations between the predictor variables. It has the undesirable effect of magnifying the standard errors and confidence intervals hence rendering the regression coefficients to become unreliable estimates (Belsley *et al*., 1980). In this research, multicollinearity was tested using a correlation matrix. Pearson correlation values greater than 0.7 are indicators of multicollinearity (Field, 2009). To solve the problem, the study adopted a method to standardize the predictors by using a method known as centering the variables. This strategy eliminates the multicollinearity occasioned by interaction and higher-order terms as successfully as the other known standardization procedures, but it has the added beauty of not altering interpretation of the coefficients (William *et al,* 2013).

Table 3: Correlation

	GDP	IT	PC
GDP	1.000		
IT	0.163	1.000	
PC	0.109	-0.272	1.000

Source: Author computation (2016)

Table 3 above gives a summary of correlation coefficients between the various variables of study namely: regional price convergence (PC) and intra-regional trade intensity index (IT) which are measures of the independent variable namely economic integration, and the moderating variable as measured using gross domestic product (GDP) growth. The overall results indicate that there is no multicollinearity between any of the explanatory variables.

6.3.2 Unit Root Tests

This was a time series study. Most economic variables are usually non-stationary in nature and therefore prior to running a regression analysis it is important to test for stationarity. Unit root tests were thus conducted using the ADF test to establish whether the variables were stationary or non-stationary. The purpose of this is to avoid spurious regression results being obtained by using non-stationary series. The trend analysis indicated that the variables changed over time. However some variables indicated long increasing trends followed by long decreasing trends which was an indicator of predictability thus suggesting presence of unit roots. The tests were conducted to establish the presence of unit roots in the data.

Table 4 gives a summary of stationarity test results. The variables subjected to unit root test as captured in tables 6.3 include: foreign direct investment (FDI) which is the dependent variable, the two indicators of economic integration which is the independent variable namely regional price convergence (PC) and intra-regional trade intensity index (IT), and Gross domestic product (GDP) growth rate which is a moderating variable.

Table 4: Unit Root Test at Level

Variable name	ADF test	1% Level	5% Level	10% Level	Comment
FDI	0.24643	-3.5550	-2.9155	-2.5956	Non Stationary
GDP	-6.0957	-3.5461	-2.9117	-2.5936	Stationary
IT	-1.2560	-3.5504	-2.9135	-2.5945	Non Stationary
PC	-3.9032	-3.5461	-2.9117	-2.5936	Stationary

Source: Author computation (2016)

The table shows the critical values at different significance levels and the corresponding ADF test statistic. The null hypothesis that the residuals ε_t are not

stationary is rejected if the ADF test statistic is more negative than the critical value.

The findings indicated that all the variables were non stationary at level apart from economic growth and regional price convergence which did not indicate presence of unit root at 1%, 5% and 10% significance level. The study further conducted first differencing and tested for the presence of unit roots again. The results are presented in Table 5.

Table 5: Unit Root Test at First Differencing

Variable name	ADF test	1% Level	5% Level	10% Level	Comment
DFDI	-7.3224	-3.5713	-2.9225	-2.5992	Stationary
DIT	-6.2086	-3.5627	-2.9188	-2.5973	Stationary

Source: Author computation (2016)

The study findings indicated that all the non-stationary variables at level became stationary after first differencing.

6.3.3 Test for Normality of Residuals
To establish whether the residuals are normally distributed, the study adopted the Jarque-Bera test which is a more conclusive test than the graphical inspection approach of testing for normality. The null hypothesis under this test is that the residuals are not significantly different from a normal distribution. Given that the p-value is greater than 5% for the residual, the null hypothesis is not rejected and thus the conclusion that the residuals are normally distributed.

Table 6: Normality Test of Residuals

Skewness/ kurtosis test for normality					
Variable		Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
Residual	60	0.0536	0.0052	9.74	0.077

Source: Author computation (2016)

6.3.4 Test for Heteroskedasticity
Ordinary least squares (OLS) assumption stipulates that the residuals should have a constant variance (i.e. they should be Homoskedastic). The plot presented in Figure 5 shows that the error terms are evenly spread above and below the reference line indicating constant variance. The results were further confirmed using the White's test where the null hypothesis of the test is error terms have a constant variance (i.e. should be Homoskedastic).
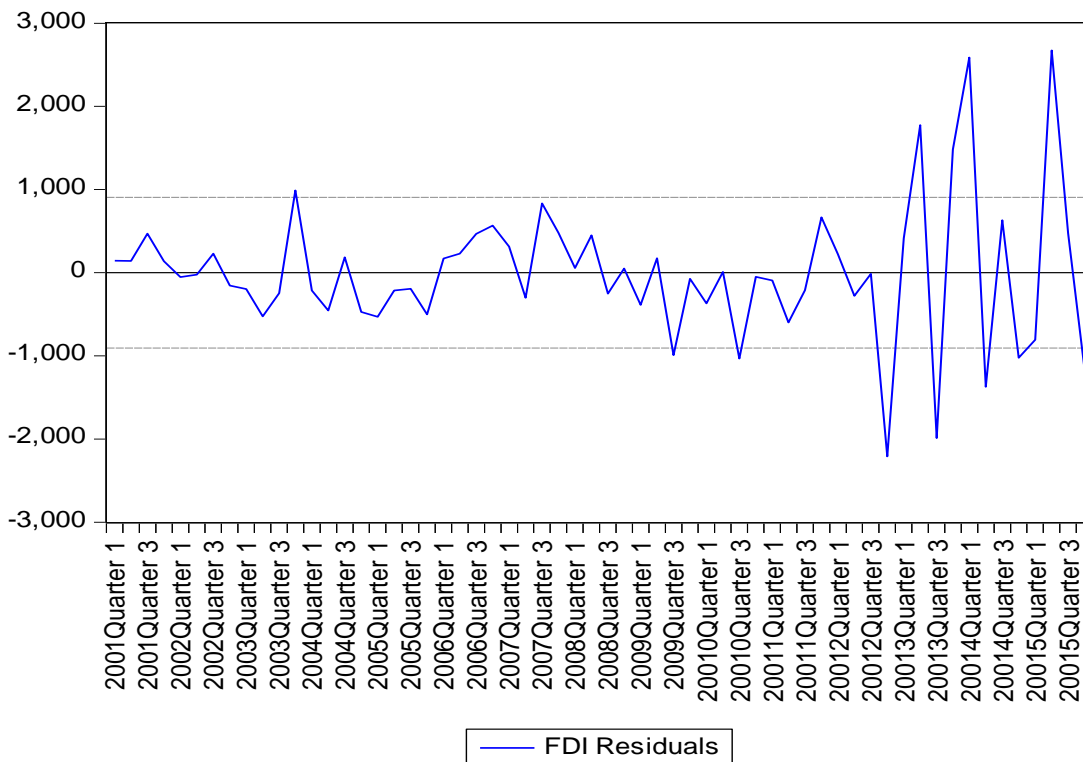
Figure 5:Residuals Plot for Heteroskedasticity

The white test results in the Table 7 indicate that the error terms are Homoskedastic, given that the p-value is greater than the 5% and thus no violation of the OLS assumption of constant variance of residuals.

Table 7: White Test for Heteroskedasticity

```
White's test for Ho: homoskedasticity
         against Ha: unrestricted heteroskedasticity


         chi2(44)    =      55.87
         Prob > chi2 =      0.1082
```

6.3.5   Test for Autocorrelation

The test for autocorrelation was performed to establish whether residuals are correlated across time. OLS assumptions require that residuals should not be correlated across time and thus the Breusch–Godfrey test which is also an LM test was adopted in this study. The null hypothesis is that no first order serial /auto correlation exists. The results of the Table 8 indicate that the null hypothesis of no

autocorrelation is rejected and that residuals are auto correlated (p-value=0.008). This means that the residuals suffer from first order autocorrelation. The study solved for this problem by using robust standard errors. Obs* R-squared means "(the number of observations times the R-square) statistic.

Table 8: Breusch- Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	4.745	Prob. F(2,49)	0.013
Obs* R-squared	9.735	Prob. Chi-Square(2)	0.008

Source: Author computation (2016)

6.4 Reverse Causality between Foreign Direct Investment and Economic Growth

Economic growth has been used as one of the explanatory variables, but some studies have shown that FDI is responsible for driving economic growth (Borensztein *et al*, 1997; Alfaro *et al*, 2006; Katerina *et al*, 2004). Therefore, it was important that reverse causality should be conducted in this study to establish the direction of relationship. The study conducted a causality test to establish this relationship. Results are as presented in Table 9

.

Table 9: Reverse Causality test between FDI and Economic growth

Pair wise Granger Causality Tests			
Null Hypothesis:	Obs	F-Statistic	Prob.
LOGGDP does not Granger Cause LOGFDI	54	2.8945	0.0648
LOGFDI does not Granger Cause LOGGDP		1.5526	0.2219

Source: Author computation (2016)

The results presented indicates that the null hypothesis that economic growth does not granger cause foreign direct investment is not rejected since the probability value is greater than 0.05 at 5% level of significance. This implies that economic growth granger causes foreign direct investment.

The results also indicates that the null hypothesis that foreign direct investment does not granger cause economic growth is not rejected since the probability value is greater than 0.05 at 5% level of significance. This implies that foreign direct investment granger causes economic growth.

The study findings indicate that there is bi-directional causality relationship between foreign direct investment and economic growth as each causes the other. Furthermore, the study went ahead to draw a graph to indicate the trend of the two variables as indicated in Figure 6.
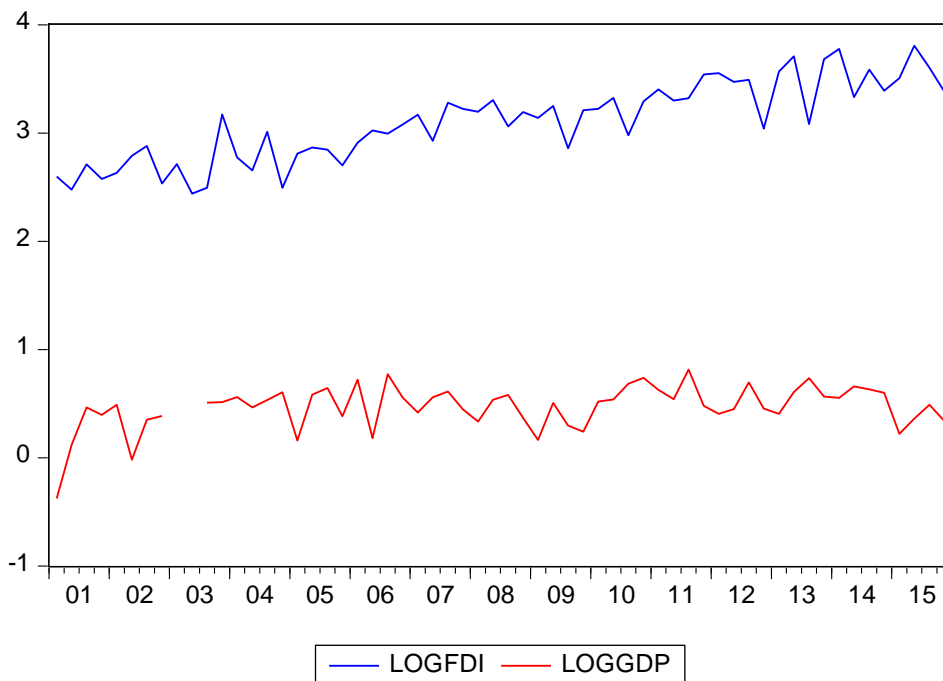

Figure 6: Graphical Representation of Causality between FDI and GDP
Source: Author computation (2016)

Granger (1969) indicates that when time series X Granger-causes time series Y, the patterns in X are approximately repeated in Y after some time lag and vice versa as indicated in Figure 10. Thus, past values of foreign direct investment can be used for the prediction of future values of economic growth and vice versa ceteris paribus.

7 Empirical Results

The objective of this study was to find out the moderating effect of economic growth on the relationship between economic integration and foreign direct investment in the East African Community. The hypothesis related to this objective was: *Economic growth rate does not significantly mediate the relationship between economic integration and foreign direct investment in the East African Community.*

The moderating effect of economic growth on the relationship between economic integration and foreign direct investment was measured using hierarchical regression. Two regression models were ran to test the moderation effect. The first model had foreign direct investment (dependent variable) being regressed against economic integration (independent variable) and economic growth (moderating variable). The second model had foreign direct investment (dependent variable) being regressed against economic integration (independent variable) and economic growth (moderating variable) and the interaction term. The interaction term was formulated from a product of the indicator of economic integration (intra-regional trade intensity index/regional price convergence) and the indicator of economic growth (GDP growth rate). The possibility of multicollinearity problem that might be occasioned by multiplying the indicators in this manner was addressed by rescaling the values of indicators such that they are centered near zero (this is accomplished by centering the values of indicators at their means).

Since the independent variable (economic integration) is measured using two different indicators for which a composite indicator could not be obtained, two separate regressions were run using the procedure outlined in the previous paragraph. Tables 10 and 11 below show the multiple regression results obtained by the two models:

Table 10: Relationship between intra-regional trade intensity, economic growth, interaction term (LOGIT*LOGGDP) and foreign direct investment

	Model 1		**Model 2**
Constant	3.2971(0.000)		3.412(0.000)
LOGIT	1.2036(0.000)		1.2115(.002)
LOGGDP	0.3105 (0.037)		0.3324(0.045)
LOGIT*LOGGDP			0.5417(0.004)
Adjusted R-squared	0.5629		0.5782
F statistic	37.7033 (0.000)		32.4012(0.009)

(P - Values are in parentheses)
Model 1: predictors – (constant), intra-regional trade intensity index, GDP
Model 2: predictors - (constant), intra-regional trade intensity index, GDP, LOGIT*LOGGDP

The results obtained from model 1 as captured in table 5.3 above show that intra-regional trade intensity and economic growth have a significant (P value = 0.000 at $\alpha=0.05$) influence on foreign direct investment. Intra-regional trade intensity and economic growth explain 56.29% of the variation in foreign direct investment in the East African Community. In Model 2, the interaction term between intra-

regional trade and economic growth (LOGIT*LOGGDP) is added as an extra explanatory variable on top of intra-regional trade intensity and economic growth. The results of model 2 show that intra-regional trade intensity, economic growth and the interaction term (LOGIT*LOGGDP) jointly have a significant (P value = 0.009 at α=0.05) influence on foreign direct investment in the East African Community. Model 2 further reveals that intra-regional trade intensity, economic growth and the interaction term (LOGIT*LOGGDP) explain 57.82% of variation in foreign direct investment in the East African Community. Furthermore, the results given by model 2 compared to model 1 shows that when the interaction term is added to the model the explanatory power increases by 1.53% (from 56.29% to 57.82%). The interaction term coefficient shows the effect of economic integration (IT) on FDI given a unit increase in GDP. It is therefore concluded that economic growth has a significant (α = 0.004) positive (positive coefficient = 0.5417) moderating effect on the relationship between economic integration and foreign direct investment.

The researcher then conducted a test of the moderating effect of economic growth on the relationship between economic integration and foreign direct investment using regional price convergence as the measure of economic integration. The hierchical regression results that were obtained are as captured in Table 11 below.

Table 11: Relationship between regional price convergence, economic growth, interaction term (LOGPC*LOGGDP) and foreign direct investment

	Model 1		**Model 2**
Constant	3.0891(0.000)		3.0947(0.000)
LOGPC	-0.2061(0.034)		-0.2215(.039)
LOGGDP	0.8818(0.0277)		1.0417(0.042)
LOGPC*LOGGDP			0.1248(0.020)
Adjusted R-squared	0.1160		0.1351
F statistic	4.7400 (0.0126)		4.6142(0.027)

(P values are in parentheses)
Model 1: predictors – (constant), regional price convergence, GDP
Model 2: predictors - (constant), regional price convergence, GDP, LOGIT*LOGGDP
Source: Author computation (2016)

The results in model 1 indicates that regional price convergence and economic growth have a significant (P value = 0.0126 at α=0.05) effect on foreign direct investment. The two variables explain 11.60% of variation in the foreign direct

investment in East African Community. Model 2 shows that regional price convergence, economic growth and the interaction term (LOGPC*LOGGDP) have a joint significant (P value = 0.027 at α=0.05) effect on foreign direct investment. These three variables jointly explain 13.51% of variation in foreign direct investment in the East African Community. The introduction of interaction term (LOGPC*LOGGDP) increases the model explanatory power by1.91% (from 11.60% to 13.51%) implying that economic growth moderates the relationship between economic integration and foreign direct investment. The moderation effect is positive meaning that an increase in economic growth leads to increased foreign direct investment in the East African Community. Hence, this study rejects the null hypothesis that, *Economic growth rate does not significantly mediate the relationship between economic integration and foreign direct investment in the East African Community*

The findings of this study are supported by previous studies which have established that there exists relationship between economic integration and economic growth, and also that economic growth affects foreign direct investment. For instance, Narendra & Goel (2014) found out that economic integration has a significant positive impact on economic growth. On the economic growth – foreign direct investment nexus, Mottaleb & Kalijaran (2010) in their study demonstrated that countries with larger GDP and high GDP growth rate, higher proportion of international trade and with more business friendly environment are more successful in attracting foreign direct investment. Consistent findings were realized by Iamsiraroj & Doucouliagos (2015) who after seeking to identify the significance and the strength of the impact of economic growth in a host country on FDI inflows found out that there is a robust positive relationship between growth and FDI. Similarly, Ali khan & Nawaz (2010) found that higher economic growth rate is associated with greater inflow of FDI.

8 Conclusion

The objective of the study was to determine whether economic growth moderates the relationship between economic integration and foreign direct investment in the East African Community. A hierarchical regression model was used to test the moderating effect. An interaction term was computed as a measure of the moderation effect. The results showed that economic integration has an enhancing moderating effect on the relationship between economic integration and foreign direct investment, that is, increasing the economic growth rate would increase the effect of economic integration on the foreign direct investment.

Furthermore, the study performed some supplementary analysis to give a more complete picture on the relationship between the variables of interest. An analysis was done to establish whether there exists reverse causality between economic

growth and foreign direct investment. After conducting granger causality it was established that there is bi-directional causality relationship between foreign direct investment and economic growth as each causes the other.

This study found out that economic integration leads to attraction of foreign direct investment. As measured using regional price convergence, economic integration has a significant positive effect on foreign direct investment. The results returned a coefficient of -2.00 and P - value of 0.048 implying that a decrease in regional price variance (that is, a tendency towards regional price convergence) leads to increased foreign direct investment. Similarly, as measured using intra-regional trade intensity economic integration has a significant positive effect on foreign direct investment. The results returned a coefficient of +1.29 and P - value of 0.00.

 The study added an important dimension to the extent that the influence of economic integration on foreign direct investment should not be evaluated in isolation. There are other important variables that dictate how economic integration relates with foreign direct investment. One of these important influencers is economic growth. When economic integration is measured using regional price convergence the resulting interaction term returns a coefficient of +0.1248 and P-value of 0.020 while when economic integration is measured using intra-regional trade intensity, the resulting interaction term coefficient and P-value are +0.5417 and 0.004 respectively.

Economic Policy makers within East African Community (EAC) are informed by the findings of this study that economic integration is an important ingredient in stimulating increased foreign direct investment. Therefore, there is a need to continue deepening the integration. Towards this end, the East African Community would achieve more integration if concerted efforts were made in taking measures that would intensify intra-regional trade. The study has shown intra-regional trade as a measure of integration that better explains the behavior of foreign direct investment to a much greater extend as compared to regional price convergence. The extent of integration is typically observed in bilateral trade of countries. Trade volume is an all-encompassing variable that is responsive to changes over time in the advancement of regional integration. It is also a fact that trade and investments are interdependent flows.

The policymakers should focus on growing the regional economies because an increase in economic growth catalyzes the rate at which a deepening in economic integration increases foreign direct investment. The foreign investor is not just interested in the degree of EAC integration but also the potential return on investment and the population purchasing power and economic growth is the indicator of this.

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