FDI, Economic Growth and Service Sector Value Additions in Ghana

Mustapha Immurana (Corresponding Author)
Department of Economics, Mangalore University, Mangalagangotri - 574 199,
Karnataka State, India.
E-mail: geniusmuso@gmail.com

Joseph Yensu
Institute of Entrepreneurship and Finance, Kumasi Polytechnic, Kumasi-Ghana.
E-mail: joseph.yensu@yahoo.com

Sahabi Ibrahim
Christ Apostolic University College, Kumasi-Ghana
E-mail: isahabi@yahoo.com

Baba Adam
Zoomlion Ghana Limited, Bolgatanga, Ghana
E-mail:adamsgis@yahoo.com

Abstract
Empirical literature on the impact of FDI on economic growth has been mixed. However some researchers are of the opinion that the inconclusiveness could be attributed to how FDI affects the various sectors of the Economy and not Growth as a whole. Therefore given that governments of developing economies including Ghana have been putting in place measures in order to attract FDI to stimulate economic growth, this study investigated the impact of FDI on economic growth and service sector value additions in Ghana. By employing the Johansen Cointegration technique, the study revealed FDI to have a positive significant impact on economic growth both in the long-run and short run and rather only a positive significant impact on the service sector in the short run.
Keywords: FDI; Economic Growth, Service Sector, Co-integration, Ghana

1. Introduction
It is generally acknowledged that foreign direct investment (FDI) improves the productivity in host nations and stimulates economic development. Yet, the distribution of FDI is vastly

uneven and poor countries face major challenges in attracting foreign investors (Addison 2003). This has led to significant competition among governments to attract FDI inflows resulting in a phenomenon where many countries eliminate trade restrictions, offer tax and other incentives in a move towards encouraging FDI. Thus, many developing countries have adopted strategic policies in attempt to attract FDI which has seen an increase from 24% of total foreign investment in 1990 to 61% in 2000 (world bank, 2001). For policymakers, efforts to promote foreign direct investments to enhance domestic economic growth has been ruled by the fact that technology transfers bring technological diffusion through generating technological spill-overs for domestic firms, and foreign investment is projected to boost existing stock of knowledge and labour skill acquisition in host countries.

But theory provides contradictory predictions regarding the relationship between FDI and growth. The new endogenous growth models suggest FDI inflows can stimulate economic growth rate in host economies through technology dissemination and spill-over effects. The general effect of FDI therefore is expected to boost productivity of all firms and not just those receiving foreign capital. The spill-over effects from FDI are regarded the most significant channels for modern technology dissemination (Blomstrom, 1989). A succinct illustration of this idea by Romer (1993) suggests that, there is an existence of wide knowledge gap between rich and poor countries. Hence, FDI inflow is an enhancing mechanism to narrow such knowledge gap. However, Boyd and smith (1992), in contrast suggest, FDI may further distort resource allocations and dampen growth in an economy in the face of already existing financial, price and other market distortions.

Bhagwati (1978) postulates that, the bulk and significance of incoming FDI depends on whether a nation is following the export promoting (EP) or the import substituting (IS) policy. Testing this hypothesis, Balasubramanyam (1996) observed that, the growth enhancing impact of FDI inflows in export-promoting countries is stronger than the FDI contribution effect on growth in import substitution countries.

With this background, it is not surprising that vast research works have developed around the growth impact of FDI inflows. Majority of the studies used cross-country regressions to establish empirical connections between FDI and varying economic variables. Not only is the literature on the growth effect of FDI extensive but controversial as well. Borensztein et al. (1998) found that FDI is positively associated with growth through technology transfers. Chen et al. (1995) observed a positive link between FDI volumes and economic growth in China by enhancing capital formation, export earnings, and improving managerial skills. Blomstrom et al. (1992) also found evidence of stimulated growth through technological upgrading and knowledge spillovers associated with FDI inflows using a panel data from 78 developing countries. Nair-Reichert and Weinhold (2001) investigated the causation between FDI inflows and economic growth among 24 developing countries and observed a positive causal relationship running from FDI to economic growth. Also, FDI has been established as a major source of stimulating domestic investment and growth in 66 developing countries (Makki and Somwaru 2004). Conversely, empirical findings by Chowdhury and Mavrotas (2005) showed that it is rather GDP that causes FDI in the case of Chile. Similar findings in the case of Pakistan also revealed that it is GDP that causes FDI (Ozturk & Kalyoncu 2007). Findings by Carkovic and Levine (2002) and Durham (2004) suggest no direct effect of FDI inflows on economic growth. In analysing the general impact of FDI in host countries, Balasubramanyam et. al. (1999) contend that, significant role is played by both the size and competitiveness of the domestic market.

On Ghana, Karikari (1992) and Frimpong and Oteng-Abayie (2008) found that, FDI does not influence (does not granger cause) economic growth, on the contrary, Sakyi (2011), Insah (2013) and Antwi et al (2013) found a positive relationship between FDI and economic growth. However all these studies used data that are not current as the one adopted by this study. In addition since Alfaro (2003) contends that the conflicting results can be attributed to how FDI affects sectors of the economy, this study went beyond the frontiers of the studies above by not only looking at the impact of FDI on economic growth but also further, looked at the impact of FDI on the Service Sector as a whole. This is because Lipsey et al. (2010) contends that, FDI inflows are expected to raise the competitiveness of services by enhancing the productivity of capital. In addition, it was worth finding the impact of FDI on the service sector in Ghana, given that; the service sector has been growing recently. For example the service sector grew by 6% in 2014 alone and contributed to 52% of the GDP in the same year (GSS, 2015). This would help to confirm or refute the assertion of Lipsey et al. (2010) and bring to light the exact impact of FDI towards such growth in the service sector and hence influence policy prescriptions.

2. Methodology

Data for this study was gleaned from different three sources (World Development Indicators, International Financial Statistics, and African Development Indicators). Annual time series data spanning from 1980 to 2013 on real Gross Domestic Product (GDP), FDI, Services as a Percentage of GDP, gross fixed capital formation, exports and imports, exchange rate and inflation were gathered from the aforementioned sources.

2.1 Description of Variables

2.1.1 Real GDP (RGDP)

Real GDP (constant 2005 US$) in this study was used to proxy economic growth. A rise in in real GDP implies increments in productivity or output and a growth in the general economy.

2.1.2 Gross Fixed Capital Formation (% of GDP)

Gross fixed capital formation (GFCF) includes the construction of railways, roads, purchases of equipment, machinery and plant as well as the construction of industrial buildings in the Ghanaian economy. It was anticipated to have a positive impact on the service sector and growth.

2.1.3 Exchange Rate (EXR)

The exchange rate used was the Ghana Cedi – US Dollar Rate. Exchange rate fluctuations affect market transactions and consequently economic growth. So we therefore anticipated the exchange rate to have a negative impact on both economic growth and the service sector.

2.1.4 Foreign Direct Investment (FDI), Net Inflows (% of GDP)

It is the summation of earnings reinvested, equity capital, other long-term capital, and short-term capital as seen in the balance of payments of Ghana. Thus these net inflows from foreign investors were divided by GDP. We hypothesized that FDI inflows would positively influence the Growth of the service sector as well as real GDP.

2.1.5 Inflation (INFL)

Inflation figures used in this study represented consumer price index. Inflation was used to proxy macroeconomic instability and for this reason; a negative connection between inflation and growth as well as the service sector was anticipated.

2.1.6 Service Value Additions (SERV) (Constant 2005 US$)

This comprises of value additions in retail and trade and other services in the Ghanaian economy. Data employed was in real terms and was used as a proxy for the service sector. We assumed a positive link between this sector and FDI.

2.1.7 Trade Openness (TRADE)

This variable was calculated as the proportion of the amount of exports and imports to GDP. This was used to measure how liberalized or opened Ghana's trade market was with the rest of the world. Because there would be fewer restrictions on imports and exports, quality inputs and capital could easily be imported to engage in production. We therefore expected this variable to positively affect the service sector as well as economic growth.

2.2 Models Specification

Since we anticipated that the rate of growth of GDP depended on the above variables, we hypothesize the following equation where ε_t symbolized variables outside the model.

$$RGDP_t = f(FDI_t, INFL_t, EXR_t, TRADE_t, GFCF_t) + \varepsilon_t \tag{1}$$

To linearize equation (1), we assumed a Cobb-Douglas log-linear model of the following form which was multiplicative in nature;

$$RGDP_t = \alpha_0 (FDI_t)^{\alpha_1} (INFL_t)^{\alpha_2} (EXR_t)^{\alpha_3} (TRADE_t)^{\alpha_4} (GFCF_t)^{\alpha_5} u_t^{\varepsilon_t} \tag{2}$$

Taking the natural log of equation (2) to bring all variables in the same unit gave;

$$InRGDP_t = \alpha_0 + \alpha_1 InFDI_t + \alpha_2 InINFL_t + \alpha_3 InEXR_t + \alpha_4 InTRADE_t + \alpha_5 InGFCF_t + \varepsilon_t \tag{3}$$

Thus with regards to the impact of FDI on the Service sector, lnSERVt will now be the dependent variable.

2.3 Unit Root Testing

In dealing with data of such nature, it was important to test for unit root in order to know the order of integration of each series as well know the number of times a series must be differenced to attain stationarity. In this quest, the study utilized the augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) unit root tests. The PP test was adopted to deal with the rather restrictive assumption of the ADF.

2.4 Cointegration

After establishing the unit root status of the variables, the next step was to test for the existence of a long run relationship between the variables. The study therefore adopted the cointegration test by Johansen (1988, 1991) and the vector error correction model (VECM) approach.

Thus to examine the impact of FDI on the economy, we posited the VECM of the form:

$$InRGDP_t = \alpha_0 + \sum_{i=1}^{n} \Phi InRGDP_{t-i} + \sum_{i=1}^{n} \Phi InFDI_{t-i}$$

$$+ \sum_{1=0}^{n} \partial InINFL_{t-i} + \sum_{i=0}^{n} \Omega InEXR_{t-i} + \sum_{i=0}^{n} \varphi InTRADE_{t-i}$$

$$+ \sum_{i=0}^{n} \psi InGFCF + \varepsilon_t \quad + \tag{4}$$

$$\Delta InRGDP_t = \alpha_0 + \sum_{i=1}^{n} \Phi \Delta InRGDP_{t-i} + \sum_{i=1}^{n} \Phi \Delta InFDI_{t-i}$$

$$+ \sum_{1=0}^{n} \partial \Delta InINFL_{t-i} + \sum_{i=0}^{n} \Omega \Delta InEXR_{t-i} + \sum_{i=0}^{n} \varphi In\Delta TRADE_{t-i}$$

$$+ \sum_{i=0}^{n} \psi \Delta \ln GFCF_{t-i} + \xi ECT_{t-1} + \varepsilon_t \qquad (5)$$

Where ξ was the coefficient of the error correction term (ECT_{t-1}) which measured the pace with which the model adjusted to long-run equilibrium after a shock, ε_t was the error term while the other variables still maintained their usual definitions.

In order to analyse the short-run and long run impact of FDI on the service sector, we estimated the following VECM:

$$\ln SERV_t = \beta_0 + \sum_{i=1}^{n} \beta_1 \ln SERV_{t-i} + \sum_{i=1}^{n} \beta_2 \ln FDI_{t-i}$$
$$+ \sum_{1=0}^{n} \beta_3 \ln INFL_{t-i} + \sum_{i=0}^{n} \beta_4 \ln EXR_{t-i} + \sum_{i=0}^{n} \beta_5 \ln TRADE_{t-i}$$
$$+ \sum_{i=0}^{n} \beta_6 \ln GFCF_{t-i} + \varepsilon_t \qquad (6)$$

$$\Delta \ln SERV_t = \beta_0 + \sum_{i=1}^{n} \beta_1 \Delta \ln SERV_{t-i} + \sum_{i=1}^{n} \beta_2 \Delta \ln FDI_{t-i}$$
$$+ \sum_{i=0}^{n} \beta_3 \Delta \ln INFL_{t-i} + \sum_{i=0}^{n} \beta_4 \Delta \ln EXR_{t-i} \sum_{1=0}^{n} \beta_5 \Delta \ln TRADE_{t-i}$$
$$+ \sum_{i=0}^{n} \beta_6 \Delta \ln GFCF_{t-i} +$$
$$+ \chi ECT_{t-1} + \varepsilon_t \qquad \textbf{(7)}$$

Where $SERV_t$ represented service sector growth. All the other variables were as previously defined, with the coefficient of the error correction term being χ.

3.0 Results And Discussions

3.1 The Augmented Dickey-Fuller Test

Table 1: Augmented Dickey-Fuller (ADF) Unit Root Test Results

Variable	Levels		First Difference	
	Constant	Constant and Trend	Constant	Constant and Trend
lnRGDP	2.651460	-1.811479	-5.126370*	-4.972529*
lnFDI	-0.803339	-2.619411	-5.179736*	-5.182304*
lnINFL	-3.715295	-5.070960	-8.328569*	-8.220125*
lnEXR	-3.022927	-1.117210	-3.182755**	-4.194359**
lnGFCF	-1.487107	-1.645019	-5.408002*	-7.343377*
lnSERV	-1.338268	-1.661149	-5.971051*	-6.105854*
lnTRADE	-1.354677	-1.265349	-4.396838*	-7.861267*

Note: * and ** respectively denoted significance at 1 and 5% level.

The results showed that, for each variable at the log levels, the null hypothesis of unit root could not be rejected. However, at first difference, all our variables become stationary at either 1% or 5% significance level using the ADF test. However, Since the ADF test assumes homoscedastic error terms, the study conducted the PP test which corrects the weaknesses

of the ADF owing to its restrictive assumption. Results from the PP unit root tests were shown in Table 2 below.

3.2 Phillips-Perron Test (PP)
Table 2: Phillips – Perron (PP) Unit Root Test Results

Variable	Log Levels		First Difference	
	Constant	Constant and Trend	Constant	Constant and Trend
lnRGDP	2.651460	-4.318815	-3.330856**	-3.225095***
lnFDI	-0.690335	-2.606519	-5.213267*	-5.204811*
lnINFL	-3.634901	-5.311465	-16.45639*	-20.70536*
lnEXR	-5.782935	-0.734770	-3.182327**	-4.152161**
lnGFCF	-1.594694	-1.501867	-5.550701*	-10.53975*
lnSERV	-1.412000	-1.736378	-6.065956*	-7.450310*
lnTRADE	-1.374386	-1.534810	-4.402033*	-4.996895*

Note: * and ** respectively denoted significance at 1 and 5% level.

Consistent with the ADF test, results from the PP test showed that none of the variables was stationary at the log level but after the first difference, all the variables became stationary.

3.3 Impact of FDI on Economic Growth
This section presented the empirical results on the impact of FDI on economic growth controlling for other determinants of growth. Since all the variables were integrated by order one, we proceeded with the Johansen test for cointegration.

3.4 Johansen Cointegration Test for the Impact of FDI on Economic Growth
The rational for the cointegration test is not far from Johansen (1991), who argues that cointegration can be employed to show whether or not there exists a linear long-run relationship between variables of interest. Thus, cointegration determines the existence of equilibrium or otherwise disequilibrium in the system following a shock. We tested the existence of this relationship using the Johansen cointegration test. One advantage of this test lies in its insensitivity to the choice of the endogenous variables. Decision with regards to long-run relationship is made by relying on the trace and maximum eigenvalue statistics. Results from the Johansen test based on the trace and maximum eigenvalue statistics were as shown in Tables 3 and 4 below.

Table 3:
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.891056	149.0301	95.75366	0.0000
At most 1 *	0.727238	86.95627	69.81889	0.0012
At most 2 *	0.575268	50.57987	47.85613	0.0271
At most 3	0.366127	26.60356	29.79707	0.1117
At most 4	0.257354	13.83816	15.49471	0.0875
At most 5 *	0.178550	5.507144	3.841466	0.0189

 * denoted rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 4:
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.891056	62.07383	40.07757	0.0001
At most 1 *	0.727238	36.37640	33.87687	0.0246
At most 2	0.575268	23.97631	27.58434	0.1355
At most 3	0.366127	12.76540	21.13162	0.4740
At most 4	0.257354	8.331014	14.26460	0.3461
At most 5 *	0.178550	5.507144	3.841466	0.0189

* denoted rejection of the hypothesis at the 0.05 level
 **MacKinnon-Haug-Michelis (1999) p-values

Both test statistics showed the presence of cointegration when real GDP was regressed on the independent variables including FDI. Specifically, using the trace test statistic, the null hypothesis of no cointegration was rejected at 5% significance level since some test statistics were greater than their respective critical values. The same conclusion was reached when the *p*-values were used as some p-values were sufficiently less than the chosen significance level. Relying on the maximum-eigenvalue test statistic also led to the same conclusion. Thus, confirming the existence of a stable long-run relationship among real GDP, FDI, inflation, exchange rate, trade openness and gross fixed capital formation to GDP.

3.5 Long-Run Estimates of the Impact of FDI on Economic Growth
Given the results from the cointegration test, we estimated the long-run parameters of our model. In other words, we estimated the impact of FDI on real GDP by controlling for other variables influencing growth. We did this by relying on the ordinary least squares (OLS) while reporting the White Heteroskedasticity – Consistent standard errors.

Table 5:
Long Run Impact of FDI on Economic Growth

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.14155	0.194068	52.25774	0.0000
lnFDI	0.103977	0.032095	3.239631	0.0034*
lnINFL	-0.018737	0.031377	-0.597151	0.5558
lnEXR	0.176684	0.043854	4.028943	0.0005*
lnTRADE	-0.114637	0.161742	-0.708764	0.4850
lnGFCF	0.271652	0.132501	2.050184	0.0510**

Diagnostic Tests
R-squared	0.948337
Adjusted R-squared	0.938005

F-statistic	91.78132	
Prob(F-statistic)	0.000000	
Durbin Watson stat	0.893132	
Serial Correlation LM Test (p-value)	7.216996	(0.0271)
Normality: Jarque-Bera test (p-value)	4.161229	(0.124853)
Heteroskedasticity: Chi-square (p-value)	14.21423	(0.0143)

Notes: * and ** respectively denoted significance at 1 and 10% level. Standard errors were the White Heteroskedasticity – Consistent standard errors.

The results showed that, even after accounting for degrees of freedom, about 94% of the changes in the dependent variable was explained by variations in the independent variables. The value of the F-statistic showed the overall significance of the model. Further results showed that our model passed all the diagnostic test of residual serial correlation and normality.

However, the Chi-square test statistics were bigger than the critical values and the *p*-values were also lower than the significance level (5%) suggesting the presence of heteroskedasticity hence our use of the White Heteroskedasticity–Consistent standard errors.

The results revealed that, FDI positively and significantly affected the real GDP. Specifically, an increase in FDI by 1%, increased real GDP by 0.1%. This implied that a surge in FDI inflows boosted the economy due to its growth enhancing effect. Although this finding was inconsistent with Durham (2004), it was consistent with Bengoa and Sanchez (2003), Sakyi (2011); and Behname (2012). Our finding is possible, as foreign capital inflow augments the supply of funds for investment, thus promoting capital formation in the host country. In addition, inward FDI increases the country's export capacity and hence an increase in foreign exchange earnings and hence overall economic growth.

The coefficient of exchange rate was also positive and significant at 1% implying that an increase in Ghana's exchange rate increased real GDP and hence growth. The explanation for this can be tied to the fact that, in the long-run, a rise in exchange rate which denotes depreciation of the Ghana Cedi makes our exports cheaper for foreigners, hence an increase in the demand for goods from Ghana. This subsequently increases exports and growth. Specifically, a 1% depreciation of the Cedi increased long-run growth by 0.18% holding all other factors constant. This finding was consistent with Insah and Bangniyei (2013).

Further results also showed the growth-inducing effect of capital formation even though at only 10% significance level. For instance, a 1% increase in gross fixed capital formation will in the long-run significantly (at 10% level) increase real GDP by 0.27%. Thus investments in physical stock stimulated growth.

The results also show that both inflation and trade openness negatively affected growth but both had insignificant effects.

3.6 Short-Run Impact of FDI on Economic Growth

Since the variables were cointegrated, their short run dynamics were studied using the VECM. The short run relationships between the variables were therefore shown in Table 6 below:

Table 6: Results on short-run impact of FDI on Economic Growth

The study showed that although past values of real GDP were negative, they were not significant in explaining current real GDP values. This was seen in both the first and second lags. Notes: * and ** respectively denoted significance at 1 and 5% level. Standard errors were the

In the short-run, FDI positively and significantly influenced real GDP and hence growth. Specifically, both the first and second lag coefficients showed that, a 1% increase in FDI

Variable	Coefficient	Stand. error	t-statistic
C	0.019529	0.00639	3.05604
D(lnRGDP(-1))	-0.310937	0.21671	-1.43484
D(lnRGDP(-2))	-0.421412	0.29709	-1.41845
D(lnFDI(-1))	0.035809	0.01441	2.48483**
D(lnFDI(-2))	0.023455	0.00871	2.69148**
D(lnINFL(-1))	-0.016977	0.00770	-2.20358**
D(lnINFL(-2))	-0.011273	0.00422	-2.66939**
D(lnEXR(-1))	0.038384	0.02885	1.33042
D(lnEXR(-2))	0.052408	0.03201	1.63707
D(lnTRADE(-1))	0.077227	0.03790	2.03786**
D(lnTRADE(-2))	-0.008927	0.03142	-0.28416
D(lnGFCF(-1))	0.123852	0.04450	2.78308*
D(lnGFCF(-2))	0.049689	0.02626	1.89246
ECT	-0.042799	0.01209	-3.54032*

significantly (at 5% level) increased economic growth (in the short-run) by 0.04 and 0.02% respectively. This finding exclusively revealed the significance of FDI in propelling economic growth in both the short- and long-run. This finding was consistent with Li and Liu (2005) and Bende et al. (2003).

Further results showed that inflation adversely affected growth in the short-run. Both the coefficients of the first and second lags were negative and significant at 5% level. Because inflation reflects percentage changes in the consumer price index, when it increases, it raises the cost of living and uncertainty in the economy, and hence channeling of scarce resources to consumption at the expense of investment. This undoubtedly lowers short-run growth. Although the coefficient of inflation was negative in the long-run, this effect was not significant and that inflation was deleterious to growth only in the short-run.

The coefficients of the lagged terms of exchange rate were consistent with their long-run estimates but not in terms of significance. Although positive, none of the coefficients of exchange rate was significant implying the effect of exchange rate on growth was only significant in the long-run.

Results from the short-run effect of trade openness and capital formation were however mixed. With regards to trade openness in the short run, the first lag coefficient positively and significantly affected economic growth. Thus opening up the Ghanaian economy to international trade propelled economic growth but only in the short-run. This was however inconsistent with the long-run effect both in terms of direction of effect and significance. Conversely, the second lag coefficient was negative – consistent with the long-run effect – but insignificant. With regards to the short-run effect of capital formation on growth, both lag coefficients were positive however, only the first lag was significant.

The ECT had a negative and significant (at 1% level) coefficient. Thus 4.3% of deviations from long-run equilibrium were corrected annually when there was a shock and hence took approximately 23 years to correct and restore full long-run equilibrium.

3.7 Impact of FDI on the Service Sector

This section presented the empirical results of the impact of FDI on the service sector as outlined below.

3.8 Johansen Cointegration Test Results for the FDI and service sector

Table 7:
Unrestricted Cointegration Rank Test (Trace)
Series: LSERV LFDI LINFL LEXR LTRADE LGFCF

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.883871	157.2700	95.75366	0.0000
At most 1 *	0.789094	96.98453	69.81889	0.0001
At most 2 *	0.626468	53.40691	47.85613	0.0138
At most 3	0.397644	25.83383	29.79707	0.1338
At most 4	0.324482	11.64045	15.49471	0.1750
At most 5	0.023181	0.656715	3.841466	0.4177

 * denoted rejection of the hypothesis at the 0.05 level
 **MacKinnon-Haug-Michelis (1999) p-values

Table 8: Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.883871	60.28551	40.07757	0.0001
At most 1 *	0.789094	43.57762	33.87687	0.0026
At most 2	0.626468	27.57308	27.58434	0.0502
At most 3	0.397644	14.19338	21.13162	0.3494
At most 4	0.324482	10.98373	14.26460	0.1550
At most 5	0.023181	0.656715	3.841466	0.4177

 * denoted rejection of the hypothesis at the 0.05 level
 **MacKinnon-Haug-Michelis (1999) p-values

Tables 7 and 8 presented results of the Johansen cointegration test based on the trace and maximum-eigenvalue test statistics respectively. From Table 7, it was clear that the null hypothesis of no cointegration was rejected at 5% significance level owing to the rather high trace statistic (95.75366) and low *p*-value (0.0000). Relying on the maximum-eigenvalue test statistic also rejected the null hypothesis of no cointegration. Rejecting the null hypothesis

showed the existence of cointegration among the variables and hence a long-run relationship between the service sector and our independent variables including FDI.

3.9 Long-Run Estimates for the impact of FDI on the service sector

Since the Johansen cointegration test showed a long-run relationship between the service sector and the independent variables, we estimated the long-run impact of FDI on the service sector while controlling for the independent variables influencing the sector. Table 9 presented the results of the estimation.

Table 9: Long-Run Impact of FDI on the Service Sector
Dependent Variable: LSERV

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.792411	0.201354	8.901791	0.0000
LFDI	-0.010518	0.022068	-0.476607	0.6378
LINFL	-0.037644	0.037119	-1.014130	0.3202
LEXR	0.148996	0.023299	6.394867	0.0000*
LTRADE	0.398479	0.116299	3.426322	0.0021*
LGFCF	0.124588	0.135833	0.917214	0.3678
Diagnostic Tests				
R-squared	0.670656			
Adjusted R-squared	0.604787			
F-statistic	10.18169			
Prob(F-statistic)	0.000021			
Durbin Watson stat	0.970775			
Serial Correlation LM Test (p-value)	9.101016	(0.0106)		
Normality: Jarque-Bera test (p-value)	1.889025	(0..888693)		
Heteroskedasticity: Chi-square (p-value)	9.908954	(0.6282)		

Note: * denoted significance at 1% level. Standard errors are White Heteroskedasticity-Consistent.

The diagnostic statistics showed that after controlling for degrees of freedom, about 60% of the changes in the service sector were caused by changes in the independent variables. Further results showed that our model passed all the diagnostic test of residual serial correlation, normality and heteroskedasticity.The independent variables were jointly significant in influencing the service sector owing to the high *F*-statistic (10.181) and the low *p*-value (0.000). Results from the long-run estimates showed a negative relationship between FDI and the service sector implying that an increase in FDI inflows reduced the value additions of the service sector. However, the low t-statistic and the high p-values made the effect of FDI on this sector insignificant. The impact of inflation and capital formation on the service sector were also less significant.

The effect of exchange rate on the service sector was positive and significant at 1% level where a unit-percentage rise in exchange rate increased the value additions of the sector by 0.15%. This suggested that a depreciation of the Cedi against the US Dollar improved the service sector.

The finding that currency depreciation had a greater positive effect on value additions in the service sector seemed plausible as this sector typically benefits from an expansionary demand from other sectors following currency depreciation. This effect is even more pronounced if other sectors are more sensitive to exchange rate changes, then the service sector stands a high chance of attracting local investment. It is reasonable to think that the exchange rate may not directly affect demand or value additions in the service sector. However, depreciation of the currency could have an indirect effect on this sector if the depreciation alters total output in the economy, and the output movements could positively affect the service sector by increasing the rate of transactions.

The effect of trade openness on the service sector was also positive and significant at conventional levels. Specifically, a unit-percentage rise in trade openness increased the long-run value additions in the service sector by 0.4%. One crucial characteristic of the service sector is the facilitating role it plays. Opening up the domestic markets to foreign players, increases infrastructure in energy, telecommunication, transportation and financial services, that allow long-run value additions in the sector.

3.10 Short-Run Estimates for the Impact of FDI on the Service Sector

The short-run parameters were estimated using the VECM and the results were presented below.

Table 10: VECM Results

Variable	Coefficient	Stand. Error	t-Statistic
C	0.041714	0.02511	1.66158
D(LSERV(-1))	0.209549	0.34879	0.60079
D(LSERV(-2))	0.550480	0.34172	1.61091
D(LFDI(-1))	0.036911	0.04382	0.84239
D(LFDI(-2))	0.128595	0.05440	2.36396**
D(LINFL(-1))	0.084583	0.08321	1.01645
D(LINFL(-2))	-0.028588	0.05264	-0.54306
D(LEXR(-1))	-0.094008	0.24065	-0.39064
D(LEXR(-2))	-0.288474	0.17067	-1.69026
D(LTRADE(-1))	-0.241800	0.24667	-0.98025
D(LTRADE(-2))	-0.071714	0.20907	-0.34301
D(LGFCF(-1))	0.478602	0.22065	2.16904**
D(LGFCF(-2))	0.758552	0.22266	3.40673*
ECT	-0.111047	0.08179	-1.35776

Notes: ** and * denoted significance at 5% and 1% level.

Results from the short-run estimates showed that both the first and second lagged value of FDI positively affected the service sector. However, only the second lagged coefficient was significant. In particular, a 1% rise in FDI significantly increased short-run value additions in the service sector by 0.13%. However, the impact of FDI on the service sector lost its significance in the long-run. Further results revealed that gross fixed capital formation positively and significantly influenced the service sector in the short-run. This was true given the significance coefficients of its first and second lags. Thus in the short-run, additions to capital stock improved the service sector. This could take the form of improvement in the transport systems thus increasing the facilitation role of the service sector. Inflation, trade

openness and exchange rate were not significant drivers of the service sector at least in the short-run.

4.0. Conclusion

The impact of FDI in economic, fiscal growth and development cannot be overemphasized. Therefore, from our empirical findings, we observed a positive long-run connection between real GDP and hence can be concluded that, FDI inflows significantly improved real GDP and hence economic growth in the long run. Further from the results, it can be concluded that FDI only significantly affected the service sector in the short-run but not in the long-run. Also depreciation of the local currency can be concluded to have a positive long-run impact on both economic growth and the service sector.

In respect of the above, we recommend that government should deepen its relations with the rest of the world in order to further attract FDI to enhance rapid economic growth. Again, government must be committed to strengthening democratic institutions as democratization has been identified to enhance FDI inflows to developing countries (Addison 2003) which would enhance economic growth.

Also rather than government always being worried about depreciation of the Ghana Cedi, this study would recommend that, an advantage of it can be taken by expanding the export sector (since depreciation of the local currency could make our exports cheaper) which may end up propelling growth of the service sector and the economy.

References

Addison, T., and A. Heshmati (2003). The New Global Determinants of FDI Flows to Developing Countries: The Importance of ICT and Democratization. WIDER Discussion Paper No.2003/45. Helsinki: UNU-WIDER.

Alfaro, L., (2003). Foreign Direct Investment and Growth: Does the Sector Matter? Harvard University, Harvard Business School, *Working Paper*.

Antwi, S., Mills, E.F.E.A., Mills, G.A., and Zhao, X. (2013). Impact of foreign direct investment on economic growth: Empirical evidence from Ghana. *International Journal of Academic Research in Accounting, Finance and Management Sciences Vol. 3, No.1,* January 2013, pp. 18–25.

Balasubramanyam, V. N., Salisu, M., & Sapsford, D. (1999). Foreign Direct Investment as an Engine of Growth. *Journal of International Trade and Economic Development*, 8,27-40.

Balasubramanyam, V., Salisu, M., & Spasford D. (1996). Foreign Direct Investment and Growth in EP and IS Countries. *Economic Journal, 106,* 92-105.

Behname, M. (2012). Foreign direct investment and economic growth: evidence from Southern Asia. *Atlantic Review of Economics, 2.*

Bende–Nabende, A., Ford, J.L, Santoso, B., & Sen, S. (2003). The interaction between FDI, output and the spillover variables: co-integration and VAR analyses for APEC, 1965-99. *Applied Economic Letters*, 10(3), 165-172.

Bengoa, M., & Sanchez-Robles, B. (2003). Foreign direct investment, economic freedom and Economic Growth: New Evidence from Latin America. European Journal of Political Economy Vol. 19 (2003) 529–545, Elsevier.

Bhagwati, J. N. (1978). The Theory of Immiserizing Growth: further applications. In International Trade and Money (ed. Michael B. Connolly and Alexander K. Swoboda), Toronto, University of Toronto Press.

Blomstrom, M. (1989). Foreign Investment and Spillovers: A Study of Technology Transfer to Mexico. Routledge, London.

Blomstrom, M., Lipsey, R., and M. Zejan. (1992): What Explains Developing Country Growth? NBER Working Paper, No. 4132.

Borenztein, E., De Gregorio, J. & Lee, J.-W. (1998). How does foreign direct investment affect economic growth. *Journal of International Economics*, 45, 115-135.

Boyd, J.H., & Smith, B.D. (1992). Intermediation and the Equilibruim Allocation of Investment Capital: Implications for Economic Development. *Journal of Monetary Economics,* 30: 409-32.

Carkovic, M., & Levine, R. (2002, August 28). Does foreign direct investment accelerate economic growth? *University of Minnesota Department of Finance working Paper*.

Chen, C., Chang, L., & Zhang, Y. (1995). The role of foreign direct investment in China's Post-1978 economic development. *World Development*, 23(4), 691–703.

Chowdhury, A. & Mavrotas, G. (2005). FDI and Growth: A Causal Relationship. UNUWIDER Research Paper No. 2005/25, UNU-WIDER.

Durham, J. B. (2004). Absorptive Capacity and the Effects of Foreign Direct Investment and Equity Foreign Portfolio Investment on Economic Growth. *European Economic Review*, 48, 285–306.

Engle, R., F., & Granger, C., W., J. (1987). Co-integration and Error Correction: Representation, Estimation, and Testing. *Econometrica,* 55(2), 251 –27

Frimpong, J. M., & Oteng-Abayie, E. F. (2008). Bivariate Causality Analysis between FDI Inflows and Economic Growth in Ghana. *International Research Journal of Finance and Economics* 15.

Frimpong, J.M. Eric Fosu, Oteng-Abayie, E.F. (2006). Bivariate Causality Analysis between FDI Inflows and Economic Growth in Ghana. MPRA Paper No. 351 http://mpra.ub.uni-muenchen.de/351/growth: new evidence from Latin America. *European Journal of Political Economy*, 19,

Ghana Statistical Service (GSS). (2015). Revised 2014 Annual Gross Domestic Product. Accra, Ghana: GSS.

Insah, B. (2013). Foreign Direct Investment Inflows and Economic Growth in Ghana.
International Journal of Economic Practices and Theories, Vol. 3, No. 2, 2013 (April), e-ISSN 2247–7225.

Johansen, S. (1988). Statistical analysis of cointegrating vactors. *Journal of Economic Dynamics and Control 12(2-3):* 231-254

Johansen, S. (1991). Estimation and Hypothesis Testing for Cointegration Vectors in Gausian Vector Autoregressive Models. *Econometrica, 59(6),* 1551-1580.

Johansen, S. and Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration with applications to the demand for money. *Oxford Bulletin of Economics and Statistics 52(2):* 169-210.

Karikari, J. A. (1992). Causality between Direct Foreign Investment and Economic Output in Ghana. *Journal of Economic Development 17 (1),* 7-17.

Li X., & Liu, X. (2005). Foreign Direct Investment and Economic Growth: An Increasingly Endogenous Relationship. *World Development,* 33, Issue 3, Pages 393–407.

Lipsey, R. E. (2003). Foreign Direct Investment, Growth, and Competitiveness in Developing Countries. In The Global Competitiveness Report, 2002–2003,ed., Peter K. Cornelius. New York:Oxford University Press.

Makki, S. & Somwaru, A. (2004). Impact of Foreign Direct Investment and Trade on Economic Growth: Evidence from Developing Countries. *American Journal of Agricultural Economic*, Vol. 86 Issue 3, August, 795-801.

Nair-Reichert, U. & Weinhold, D. (2001). Causality tests for cross-country panels: a new look at FDI and economic growth in developing countries. Oxford Bulletin of Economics and Statistic, Vol. 63, Issue 2, 153-171.

Ozturk, I., & Kalyoncu,H. (2007). Foreign Direct Investment and Growth: An Empiricial Investigation Based on Cross-Country Comparison. *Economia Internazionale,* 60, 75-82. pp. 529-45.

Romer, P. (1993). Idea Gaps and Object Gaps in Economic Development. *Journal of Monetary Economics*, 32, pp. 543-73.

Sakyi, D. (2011). Trade openness, foreign aid and economic growth in post-liberalisation Ghana: An application of ARDL bounds test. *Journal of Economics and International Finance, 3 (3):* 146- 156.

World Bank. (2001). Global development finance (CD-ROM).