

An Econometric Analysis of the Impact of Foreign Direct Investment on Economic Growth in Ghana: The Role of Human Capital Development.

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ABSTRACT: *This study examines the impact of FDI on economic growth and the role of human capital in the enhancement of FDI inflow into the country using a cointegration and error-correction mechanism. Our result show that (ECM) which is (-1.368) which suggests that the speed of adjustment towards equilibrium is fairly in moderate condition. The R= squared (0.97) and adjusted R= (0.945)are high and this fulfil the condition of good fit. The F- statistics is -36.78(000) which is significant at 1% allows us to reject the null hypothesis of no significant effect of FDI on growth in Ghana. We found that FDI has a positive significant effect in Ghana in the long run and also does human capital. We recommend that though FDI has a positive significant effect on growth, there is need for government to provide an appropriate policy environment that can enable FDI diversify into other sectors apart from the mining sectors. Also there is need for adequate policy that will improve more on the development of human capital since it has proven a source of growth and enhancement of FDI inflow.*

KEYWORD: *Foreign direct investment, human capital, economic growth*

I. INTRODUCTION

The opening of financial flows such as foreign aids, remittances and foreign direct investment has actually benefitted most developing countries. Foreign direct investment is seen as the driver to economic growth. It does not only boost capital formation of a country, but also enhances the quality of the capital stock of a nation. Most recent work on growth has highlighted FDI in the technological progress of the developing countries.

The World Bank (1996) define FDI as an investment made to acquire a lasting management interest normally 10% of voting stock, in a business enterprise operating in a country other than that of the investor according to residency. Prior to the crises of 2007, Global FDI rose to the peak of \$1, 833 billion in 2007 well above the previous times. (UNCTAD 2008).

Over the years, an increasing number of sub-Saharan Africa has opened their countries to FDI and have made FDI an integral component of their development strategies. In the 1990s, most SSA countries registered an impressive growth rate, yet the fraction received is less and cannot be compared to inflow of FDI in developed countries. Though many sub-Saharan Africa have adopted many strategies to attract FDI, such as easing import tariffs, custom controls, reduction of tax rates and tax holidays, implementing some other policy reforms such as signing of investment treaties and investment promotion activities. However, it is important to note that the adoption and application of these reforms for advanced technologies require the accumulation of substantial amount of human capital in the host economy, meaning that stock of human capital development in the host countries are essential and act as absorbing capital towards attracting FDI. In other words, the quality of labour force, the development of human capital, education system determines greatly the economy's ability to create new ideas and adopt old ones. On the reverse, FDI inflows create potential spillovers of knowledge and technologies to the local labour force. These make FDI and human capital a circular flow.

To this effect, the hypothesis remains that while some host of economies with relatively high levels of human capital may be able to attract large amount of FDI that contributes positively to the host country's labour skills, economies with weaker initial conditions are likely to experience smaller inflows of FDI and in which incoming MNCs that enter are likely to use simpler technologies that contribute only marginally to local learning and skill development. Rasak (2011).

More so, the development of human capital and improvement in education of the host countries are not only essential in absorbing and adapting foreign technology but also in generating sustainable long-run growth. In other words, it is argued that the productivity of foreign capital is dependent on the initial conditions in the host country.

Therefore, this study following the specifications of Borenstein et al (1998) examines empirically the role of FDI in the process of growth in Ghana, arguing that the development of human capital of the recipient country is an important pre-condition for FDI to have a positive impact on economic growth, as human capital positively contributes to the process of technological diffusion associated with FDI. The work covers the period of 1975-2008. The data is sourced from the World Development Indicator.

II. LITERATURE REVIEW

The argument that the contribution of FDI to growth is strongly dependent on the circumstances in the recipient countries has been an issue of most researchers. Pfeffereremmann and Maldarassy (1992) concluded that as a result of technology progress and the concomitant shift of FDI towards more capital – knowledge and skill – intensive industries, the presence of a well – educated pool of labour has become increasingly attractive for MNEs relative to low labour cost per se. Meaning that the relative importance of the motivations for FDI is changing, but the changes vary according to several factors including sector-specific patterns.

To buttress this fact, some theories of FDI explain capital flow from one country to another according to marginal productivity of capital. The theory explains that capital will flow to where the expected rate of return on investment is the highest. Differences in the rate of return between countries of origin are said to result from the relative endowment of production factors where capital is abundant in relation to the labour, the return will normally be lower than where capital is in short supply relative to the amount of labour. This still stresses on the fact that the efficient development of human capital is needed for the enhancement of inflow of FDI. To these effect Balaubramanyam et al (1996) finds that the effect on growth is stronger in countries with a policy of export promotion than in countries that pursue a policy of import substitution. Also other researchers pointed that an increase in the productivity of FDI could only be achieved if there exists a sufficiently high level of human capital in a recipient economy. Borenstein et al (1995, 1998) also had his findings using a growth model in which technical progress, a determinant of growth, is represented through variety of capital goods available. He finds that the magnitude depends on the host country's condition (human capital).

In other words, the adoption of advanced technologies by less advanced countries is not free and requires effort and capability. In particular, lack of human capacity in adopting new technology is considered a crucial factor that limits the absorptive capability of a nation. Many recent models also highlight the complementary effects between human capital and technology, as both human capital and technology investments are endogenous choices of the society. Some researchers for instance, assume that both forms of investment in human capital and technology (R&D) exhibit pecuniary externalities and are strategic complements. In his model, the incentives to invest in each are interdependent. Thus multiple equilibria exist: an economy can either fall into a low–education, low technology position or achieve a high education, high technology position.

Dunning (1993) developed a theory – Investment Development Path (IDP). One of the underlying principles of the IDP is that the economic development of a country in terms of its net inward and outward investment depends on the relative competitive strengths of the domestic firm vis-à-vis MNEs in ownership and location, specific advantages and their abilities to internalize cross border market transactions. These theories would thus help to ascertain some of the determinants of FDI into developing countries and serves as a guide to the policies. That should be developed by policy makers to attract specific kind of FDI.

Empirically, studies suggest that FDI is an important vehicle for transfer of technology, contributing relatively more to growth than domestic investment. However the higher productivity of FDI holds only when the host economy has minimum threshold of stock of human capital. Romer (1990) also quoted that it is a challenge for a non specialist to read even the surveys in the area. In connection with the theoretical model he proposed, he uses adult literacy rates as a proxy for the stock of human capital. For a sample of 112 countries, he regresses the average rate of growth between 1960 and 1985 on the initial level of income, the investment rate, government spending as a share of GDP and literacy rate in 1960. He finds that the literacy rate is significant and has the expected positive effect on growth. When adding the change in the level of literacy to the regression, however, the variables does not enter significantly. Romer argue that literacy may act through investment rate, and finds some evidence of this, but cautions that this empirical result are not peculiarly robust and may be subject to measurement error and problems due to omitted variables. His work inspired a great deal

of subsequent research. He uses school enrolment rate instead, arguing that they should be more consistent cross-sectional, although he is aware of the fact that enrolment rate is relative and more closely to the flow of investment in to human capital than to its stock, so he concluded in his findings in 1998 that the rate of output growth is strongly related to the initial quality of human capital.

III. FDI AND GHANA’S ECONOMY

Prior to 1980, the economy of Ghana has not been delving extensively and systematically into related phenomenon of FDI and MNEs. Caves (1996) pointed that the stock of literature appearing for FDI in West Africa, besides Nigeria and Ghana has been the Guinea-pig to most international organization notably the world an IMF in the implementation of various economic policy programmes.

Ghana embarked on an economic reform programme in 1983 after years of economic decline in 1970s, which led to the adoption of the World Bank /IMF programme on Structural Adjustment Programme (SAP). Reduction on government deficit spending, a floating exchange rate, reduction in an eventual elimination of import tariff and other trade barriers and elimination of barriers to FDI inflow with the three of six main key objectives of the ERP-SAP. UNCTAD (2000) reported that FDI inflows have witnessed some interesting trend over the past two decades. Ghana reported an increase in the inflow of FDI from US\$ 15 million in 1990 to US\$ 233million in 1994. Also the annual growth rate showed an increase for 2000-2006 of 53% rate. The gross capital formation in line increased to 9.8% in 2000-2004 from 4.3% in 1990 -2000 and trend in FDI.

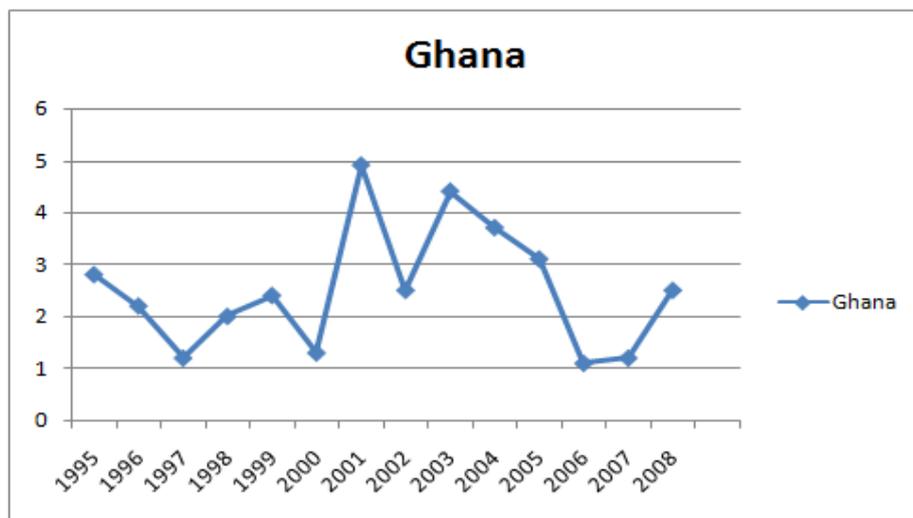


Figure 1: FDI Inflow to Ghana (millions of Dollars)

Some empirical research on Ghana used time series data, panel data and cross sectional data to determine the level of impact of FDI in Ghana. Abor, et al (2008) and Abor (2010) used a panel and cross-sectional studies and investigated the impact of FDI on exports and firm productivity respectively. Measuring FDI as percentage of foreign ownership of equity in a business entity the results showed that foreign ownership in business positively impacted on exports and firm productivity (Djokoto and Dzeha 2012). A time series study by Adeniyi et al (2012) confirm a positive effect of FDI on the economy, while FDI inflow to the economy positively impacted in the industrial sector. The summary of empirical study of the effect of FDI in Ghana’s economy shown below in table 1.

Table 1: Empirical Study of FDI on Ghana’s Economy

Authors	Dependent Variables	Definition of FDI	Period and Magnitude
Karikari (1992)	GDP	FDI as percentages of gross fixed capital formation.(IFS)	- 1961-1988
Gyapong&Karikari(1999)	GDP	FDI as percentage og gross fixed capital formation.(IFS)	+*** 1960-1980
Arbenser (2004)	Economic growth	FDI inflow	+***.
Frimpong&Oteng-	GDP growth	FDI to GDP (WDI)*	+*** 1984- 2002

Abayia(2008)			1970-2002
Abor et al (2008)	Exports	Percentage of foreign ownership	+* 1991 -2000
Adenutsi (2008)	Industrial output	FDI to GDP (WDI)	+** 1983 – 2006
Adam &Tweneboah (2009)	Stock Market Capitalization divided by GDP.	FDI inflow minus outflow (UNCTADSTAT)	+* 1991:1- 2006
Abor (2010)	Firm Productivity	Percentage of foreign ownership.	+**
Djokoto (2011)	Agriculture growth	Cash brought in by foreign investors	- 1966-2008
Adeniyi et al (2012)	Credit to private sector per GDP Real GDP growth rate	FDI to GDP (WDI)	+ **1970-2005
Dyokoto (2012a)	Daily energy <u>consumption</u> Daily protein consumption	Cash brought in by foreign investors (GIPC) divided by agricultural GDP UNSTAT)	+* 1995- 2007 +***
Dyokoto (2012b)	<u>Agricultural imports</u> <u>Agricultural exports</u>	Cash brought in by foreign investors (GIPC)	- +*** 1961-2008
Agbola (2013)	<u>Economic growth</u>	FDI to GDP (WDI)	+*** 1965- 2008

Source: Djokoto&Dzeha (2012).

IV. THEORITICAL FRAMEWORK

The neoclassical model lays an aggregate production function exhibiting constant returns to scale in labour and reproducing capital. Solow (1957) and Swan (1956) are among those who first demonstrated this. It takes the general form such as,

$$Y = F(K, L) \text{-----(1)}$$

Where Y = is output (or income)

K = is the stock of capital

The labour force. this function show that output Y under a given state of available technique, and a given array of different capital intermediate goods and consumption goods with constant return to scale, output per worker (ie labour productivity) $Y = Y/L$ will depend on the capital stock per worker (capital intensity). $K = K/L$ under the assumption of constant return to scale, the relationship each units of labour has with capital in production does not change with the quantity of capital or labour in the economy.

Romer’s second endogenous growth model (1990) recognizes human capital as a primary source of technological process and economic growth. He saw knowledge as part of the aggregate capital k and relates technological progress to an increase in capital/ labour ratio. Using a growth accounting framework to decompose the level of output per worker into the level of inputs and labour augmented productivity in this framework, the labour augmented productivity measures the level of technology. We assume Cobb-Douglas

production function that is $Y = K^{1-\alpha} (AhL)^\alpha \text{-----(2)}$

4.1. Methodolgy

Borensztein et al (1998) examine the role of FDI in the process of technology diffusion and economic growth, they find out that FDI has a positive effect on economic growth but that the magnitude of the effect depends o the amount of human capital available in the host country. He used adult literacy as a proxy for human capital. Teixeira (1997) used time series data of human capital for Portugal. He used methodology similar to that of Barro and Lee (1993), the author estimated an average time of schooling for the population of 25 years old or older during the period from 1960-1992. Following the methodology of Borensztein et al (1998) and Teixeira (1997) we examine the effect of FDI and human capital on economic growth of Ghana.

4.2 Model Specification

Assuming the Cobb-Douglas production function. We take the log of the standard augmented Solow model, then the following equation is obtained.

$$Gdppcap = f(Fdi, La, Humcap, Di, Infr, Infl, Opp,)$$

Where :

Gdppcap = Real Gross Domestic product per capita a (in log form)

Fdi = Foreign direct investment defined as (fdi/gdp* 100)

La = Labour measured as the labour participation rate.

Humcap = level of human capital (adult literacy)

Di = Domestic investment (gross fixed capital formation, FCF/GDP* 100)

Infr = Infrastructure development (per capita electricity production and telephone line)

Opp = Openness of the economy (total trade GDP ratio)

Infl = Rate of Inflation.

Given the time series nature of the data, the postulated long run model is

Model 1

$$\text{Log Gdppcap} = \text{Log}\beta_0 + \text{Log}\beta_1\text{Fdi} + \text{Log}\beta_2\text{Humacp} + \text{Log}\beta_3\text{La} + \text{Log}\beta_4\text{Di} + \text{Log}\beta_5\text{Infl} + \text{Log}\beta_6\text{Infr} + \text{Log}\beta_7\text{Opp} + e_i$$

V. DISCUSSION OF FINDINGS

Table 2: Summary of Statistics

	MEAN	MADIAN	MAXIMUM	MINIMUM	STD.DEV
LNGDPPCAP	2.626631	2.825837	3.075897	-0.672164	0.659060
LNFDI (FDI/GDP* 100)	8.47E-06	1.74E-07	0.000281	-5.87E-05	4.98E-05
LNHUMCAP	4.036261	4.060443	4.388257	3.795489	0.160791
LNDI(domestic Investment)	-1.661583	-1.677779	-0.678521	-2.287854	0.455892
LNINFL(inflation)	3.348562	3.255754	4.811164	2.308181	0.708643
LNINFR(infrastructure)	-1.521839	-1.808929	-0.161043	-2.613521	0.653291
LNLA(labour)	4.071885	4.191922	4.261270	3.716008	0.212113
LNOPP(openness)	-0.014627	0.057018	0.358022	-0.506493	0.251275

5.1 Test for Unit Root (order of integration)

f stationary or none stationary that has been popular over the years is the unit root test. Most time series variables are non-stationary and using these variables in the model could lead to spurious regressions. The augmentation of the original ADF regression with lagsofthe dependent variable is motivated by the need to generateerror term in that model, since an OLS estimator of the covariance matrix is being employed. In the Phillips–Perron (PP) unit root test,the PP test deals with potential serial correlation in the errors by employing a correction factor that estimates the long–run variance of the error process with a variant of the Newey–West formula. Like the ADF test, use of the PP test requires specification of a lag order. In principle, the PP tests should bemade more powerful than the ADF alternative. The same critical values are used for the ADF and PP tests. Therefore using Augmented Dickey-Fuller (ADF)and Phillips-Peron unit root test we test for the presence of unit roots in the variables of the various individual countries under study.

Table 3: (GHANA): Unit Root Test at Ordinary and First Difference

Variables	Level(no trend)	Level(with trend)	1 st diff (no trend)	1stdif f(with trend)
ADF				
LNGDPPCAP	-4.415605*	-4.840875*	-4.327447*	-3.475292**
LNFDI	-12.94521*	-11.89505*	-4.057155*	-5.407967*
LNHUMCAP	-1.835605	-2.309028	-5.589757	-5.503130*
LNDI	0.997261	-0.941875	-6.007990*	-7.099260*
LNINFL	-4.044308*	-4.151815**	-7.122782*	-6.971224*
LNINFR	-2.623171***	-3.424215***	-6.889315*	-6.804730*
LNLA	-1.759288	-1.795166	-3.489080**	-4.759558*
Critical value				
1% level	-3.646342	-4.262735	-3.699871	-4.356068
5% level	-2.954021	-3.552973	-2.976263	-3.595026
10% level	-2.615817	-3.209642	-2.627420	-3.233456
PP				
LNGDPPCAP	-4.402889*	-4.831850*	-4.327447*	-3.475292***

<i>LNFD</i>	-3.86402*	-11.89505*	-4.057155*	-5.407967*
<i>LNHUMCAP</i>	-1.703357	-2.309028	-5.589757*	-5.503130*
<i>LNDI</i>	1-390591	-0.941875	-6.007990*	-7.099260*
<i>LNINFL</i>	-4.186826*	-4.151815*	-7.122782*	-6.971224*
<i>LNINFR</i>	-2.548618	-3.424215***	-6.889315*	-6.804730*
<i>LNLA</i>	-1.551126	-1.795166	-3.489080**	-4.759558*
Critical value				
<i>1% level</i>	-3.646342	-4.262735	-3.653730	-4.273277
<i>5% level</i>	-2.954021	-3.552973	-2.957110	-3.557759
<i>10% level</i>	-2.615817	-3.209642	-2.617434	-3.212361

Note: * denotes significant at 1%, ** denotes significant at 5%, ***denotes significant at 10%

From the Unit root result, Ghana indicates that variables such as LNGDPPCAP, LNFDI, LNINFL, and LNINFR are stationary at level in both ADF and PP, and all of them are stationary at order one and at order one they are almost greater than 5% level, meaning that we reject all null hypothesis for the entire test.

5.2 Co-integration Test

The development of cointegration analysis allows for another approach to examine the relationship between fundamental variables. The first step in cointegration analysis is to verify the order of integration of the variables. In other words we test the variables for unit roots to verify their stationary. To ensure robustness and overcome the criticisms of any individual testing technique, both the ADF and the Phillips-Perron(PP) procedures are considered in the analysis to determine the order of integration. We have determined the order of integration of each series, then the next step is to test for co-integration relationships. We employ the maximum likelihood co-integration test by Johanson and Juselius (1990). Since co-integration refers to the possibility that non-stationary variables may have a linear combination that is stationary, which implies a long run equilibrium relationship between variables. Co integration variables move together over time so that any short run deviation from the long-term trend will be corrected.

Table 4: Johansen and Juselius Co-integration Result of Growth - FDI Model and FDI-HCD
Model.Trend assumption: Linear Deterministic Trend

GHANA								
Test	H ₀	H _A	Trace Statistics (Growth-FDI)	(λ Max)Max-eigenstatistics (Growth-FDI)	Trace statistics (FDI-HCD)	(λ Max) Max-eigen statistics (FDI-HCD)	0.05Critical Value(Trace)	0.05Critical Value(Max)
<i>r=0</i>	<i>=1</i>		333.4751*	169.6244*	325.8713*	129.0010*	159.5297	52.36261
<i>r 1</i>	<i>=2</i>		163.8506*	51.65037*	196.8703*	71.87991*	125.6154	46.23142
<i>r 2</i>	<i>=3</i>		112.2003*	36.34886	124.9904*	54.26415*	95.75366	40.07757
<i>r 3</i>	<i>=4</i>		75.85140*	28.88981	70.72623*	31.82669	69.81889	33.87687
<i>r 4</i>	<i>=5</i>		46.96159	25.02620	38.89954	19.57524	47.85613	27.58434
<i>r 5</i>	<i>=6</i>		21.93539	16.59031	19.32430	13.54688	29.79707	21.13162
<i>r 6</i>	<i>=7</i>		5.345083	3.576537	5.777418	4.943761	15.49471	14.26460
<i>r 7</i>	<i>=8</i>		1.768545	1.768545	0.833657	0.833657	3.841466	3.841466

*Denotes rejection of the hypothesis at the 0.05 level Trace test indicates 4 cointegrating eqn(s) at the 0.05 level and the Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level for Growth-FDI model, while the Trace test for FDI-HCD Model indicates 4 cointegrating eqn(s) at 0.05 level and Max-eigen value test indicates 3 cointegrating eqn(s) at 0.05 level.

5.3 Long- Run Equilibrium Estimates

The long run coefficients for Ghana are represented in the table 5. The long run coefficients are normalized multiplying by minus one.

Table 5: Longrun Normalized Coefficients of Growth-FDI Model

COUNTRIES VARIABLES	LNGDPPCAP	LNFDI	LNHUMCAP	LNDI	LNINFL	LNINFR	LNLA	LNOPP
GHANA	-1	2560898.* (43896.7)	6.316383* (1.13558)	-0.387144 (0.51454)	-0.792208* (0.20572)	2.466196* (0.19614)	12.42411* (0.99837)	-4.115398* (0.97021)

The long run estimated results show that most of the independent variables had the expected relationships with GDP per capita. FDI has a positive estimated coefficient and it is statistically significant, meaning that FDI has a positive relationship with economic growth.

Human capital (HUMCAP), also has a positive coefficient and it is statistically significant, this also shows that HUMCAP has a significant relationship with economic growth.

Domestic investment (DI) has a negative coefficient and it has no significant relationship with growth. This result also conforms with the findings which indicate that domestic capital does not affect economic growth in the long run.

Infrastructure (INFR) has a positive significant relationship with economic growth. This shows that good and quality infrastructure induces growth and also helps in attracting foreign investors. Infrastructure such as electricity production and distribution has improved so much in Ghana and this is one of the major determinants of growth. Labour (LA) also has a positive estimated coefficient and are also statistically significant. Inflation (INFL) has a negative estimated coefficient and are statistically significant, inflation which is used as a proxy for macroeconomic instability an expected sign, meaning that an unstable macroeconomic environment discourages growth.

Openness (OPP) has a negative coefficient and it has a statistically significant relationship with growth. This shows that contribution from trade is very low. Being that Export and Import are the major source of economic instability in developing countries especially in Sub-Saharan Africa where the bulk of export earnings is from primary commodities. In other words there is a need for improvement in the area of export in the country.

5.4 Error Correction Mechanism

The short-run coefficient of growth was estimated following the general to specific approach, given the fact that the number of observations is not very large; the lag structure was restricted to a maximum period of three years. For the purpose of this work we will use the Lagrange multiplier test (LM) for serial correlation.

Table 6: SHORT RUN PARSIMONIOUS GROWTH--FDI Model

Dependent Variable: Dgdppcap

Variable	Coefficient	Standard Error	t-Statistics	Probability
<i>C</i>	-0.023815	0.014349	-1.659731	0.1177
<i>DGDPPCAP(-1)</i>	0.778064	0.075576	10.29516	0.0000
<i>DGDPPCAP(-2)</i>	0.329383	0.077215	4.265798	0.0007
<i>DGDPPCAP(-3)</i>	0.151825	0.052282	2.903944	0.0109
<i>DFDI(-1)</i>	-19803.42	5012.100	-3.951123	0.0013
<i>DFDI(-2)</i>	-11139.65	1456.759	-7.646875	0.0000
<i>DHUMCAP(-2)</i>	-0.383572	0.182301	-2.104062	0.0527
<i>DDI(-1)</i>	-0.177343	0.078824	-2.249862	0.0399
<i>DDI(-3)</i>	-0.355886	0.081613	-4.360638	0.0006
<i>DINFL(-2)</i>	-0.166528	0.019395	-8.585978	0.0000
<i>DINFR(-2)</i>	0.063113	0.022142	2.850408	0.0122
<i>DLA(-2)</i>	1.863807	0.298018	6.254006	0.0000
<i>DLA(-3)</i>	-1.209786	0.294204	-4.112072	0.0009
<i>DOPP(-3)</i>	0.745981	0.164635	4.531119	0.0004
<i>ECM(-1)</i>	-1.368409	0.115451	-11.85271	0.0000
<i>R-Squared</i>	0.971697	LM Test		
<i>Adjusted R-Squared</i>	0.945280	<i>F-Statistics</i>		2.435868
<i>SF-Statistics</i>	36.78395	<i>Probability</i>		0.126342
<i>Probability F-Statistics</i>	0.000000	(Reset Test)		
Normality Test		<i>F-Statistics</i>		0.607890
<i>Jarque-Bera</i>	3.235352	<i>Probability</i>		0.448564
<i>Probability</i>	0.198359			

The results show the short run coefficient estimation, which is the coefficient variables of GDPPCAP are positive and significant at 1% percent critical value. Both the 3 lags of GDPPCAP are strongly significant. This means that changes in GDP do matter for growth. The result implies that a one standard deviation increase in the variable would rise the growth rate on impact by 1%. The coefficient variable of DFDI(-1)(-2) are negative but significant -19803.4(0.0013) and -11139.65(0.0000). Following that negative sign shows the conditional convergence and it predicts a higher growth in response to lower starting FDI, all things being equal.

The magnitude of the estimated convergence implies that convergence occurs at the rate of about $-19803.4(0.0013)$ and $-1139(0.0000)$ respectively. The negative sign can have important influence on growth rate since it is highly significant. The coefficient of $DHUMCAP(-2)$ is negative and significant, $-0.383572(0.0527)$. It also predicts higher growth in response to a lower start of the $DHUMCAP$. This also implies that the negative sign can still have important influence on growth. Also the coefficient of $DDI(-1)(-3)$ and $DINFL(-2)$ are negative but significant at the magnitude of $-0.177(0.0399)$, $-0.356(0.0006)$ and $-0.167(0,0000)$ respectively. This also shows a conditional convergence and predicts higher growth. The negative sign on inflation conforms in theory that a negative inflation influences the growth of the economy, unlike when it is high, which affects the growth of the economy.

$DINFR(-3)$ has a positive coefficient and it is significant $0.063(0.01122)$. This implies that changes in $INFR$ do matter for growth. The coefficient of $DLA(-2)$ is positive and significant $1.864(0.0000)$, this implies that LA necessitates growth in the second year, but in $DLA(-3)$ the coefficient is negative but still significant $-1.2097(0.009)$ which implies that it has a conditional convergence and predict higher growth. $DOPP$ has positive coefficient and significant $0.746(0.0004)$ and this implies that the import and export is necessary for growth. The ECM coefficient is negative at $-1.3684(0.0000)$ and significant at 1%. This suggests that the speed of adjustment towards equilibrium is fairly in moderate condition. The negative sign shows that it can still adjust to equilibrium.

The R-squared (0.971697) and adjusted $-R$ (0.945280) are high and this fulfil the condition of good fit. The F- statistics $36.78395(0.000000)$ is significant at 1% critical value and this allows us to reject the null hypothesis of no significant effect of FDI on growth. Normality test was conducted and found that variables are normally distributed at the Jaque-Bera significant of (0.198359). The serial correlation (LM test) was conducted and it was found out that the variables are not serially correlated; the F-statistics is significant at the probability of (0.126342). The Ramsey test was conducted as well and the F-statistics is significant (0.448564) showing that the models are well specified.

VI. SUMMARY AND CONCLUSION

It was found out that FDI in Ghana, has positive significant effect on growth in the long run This implies that FDI potentials in these country has positive relationship with the growth of their various country. This implies that in the long run FDI can provide much needed capital and offer the possibility of technology spillovers to the host economy. Also there is need for the countries to provide an appropriate policy environment that can enable FDI diversify into the manufacturing sector especially in Ghana that has high concentration of FDI in mining sector. This approach could partly increase growth and also employment effect. Human capital which has positive significant effect on growth in the long run coefficient of the growth model of Ghana show that the potentials of human capital brings about growth in an economy.

In order to benefit more from the presence of foreign investors in to these Sub-Saharan Africa countries and in Ghana in particular, the linkages between the country and MNEs need to be strengthened, currently; domestic firm's capabilities are inadequate with respect to offering high-quality products the MNEs would like to source domestically. They also lack the capacity to benefit from technological spillover, in other words it is useful to develop a national technology strategy that would focus on the main sectors for development, and then involve all parties concern with science and technology. These will be of benefits to Ghana and other African countries in that such programme could raise the awareness of the value of technological knowledge by starting with the analysis of the current strength and weakness bringing fort the most priority sectors in question and then setting up an action plan that will enhance commitment by stake holders and the mobilization of resources. Apart from mining and manufacturing industries in the countries, other sectors that are relevant for development could be source of potential benefits with more foreign investments. Though efforts has been made in the telecommunication sector to promote growth, yet more efforts should be made to strengthen the developments of these sectors because telecommunications infrastructure is one of the key determinant in attracting more foreign firms and also in promoting the growth of the existing foreign and domestic firms and other infrastructures such as electricity production and distribution as these will give strong confidence to foreign investors and also finance. These Sub-Saharan countries lack well developed financial markets. Investments in these sectors by foreign investors could provide much needed capital for investment and at the same time increase competition in the banking sector, by ensuring a better access to credit at lower cost.

REFERENCE

- [1]. Abor, J. (2010), "Foreign direct investment and firm productivity: Evidence from firm- level data". *Global Business and Economics Review*, 12(4), pp. 267-285.
- [2]. Abor, J., Adjasi, C.K.D and Hayford M.C (2008), "Foreign direct investments affect the export decisions of firms in Ghana?" *Africa Development Review*, 20(3), pp. 446-465.
- [3]. Adam, A. M. and Tweneboah, G. (2009), "Foreign direct investment and stock market development: Ghana's evidence", *International Research Journal of Finance and Economics*, 26,178-185.
- [4]. Adeniyi, O., Omisakin, O., Egwaikhide, F.O. and Oyinlola, A. (2012), " Foreign direct investment, economic growth and financial sector development in small open developing economies", *Economic Analysis and Policy*, 42 (1), 105-127
- [5]. Adenutsi, D. E. (2008), "Effect of trade openness and foreign direct investment on industrial performance in Ghana", *Journal of Business Research*, 2(1&2), 71-89.
- [6]. Agbola, F. W (2013), "Does human capital constrain the impact of foreign direct investment and remittances on economic growth in Ghana?" *Applied Economics*, 45(23), 2853-2862.
- [7]. Arbenser, L (2004), "A general equilibrium analysis of inward FDI an Ghana: The role of complementary policies", *Working paper 69/2004*. Humboldt University Berlin, Department Agriculture Economics.
- [8]. Balasubramanyam, V.N., M. Salisu, and D. Sapsford (1996), "Foreign Direct Investment and Growth in EP and IS Countries", *The Economic Journal*, Vol.106, No.1, pp.92-105.
- [10]. Baro, Robert J., Jong-Wha Lee (1993). International Comparisons of Educational Attainment. *Journal of Monetary Economics* 32: 363-394.
- [11]. Borensztein, Eduardo, Jose de Gregorio and Jong-Wha Lee (1995), "How Does Foreign Direct Investment Affect Economic Growth?" NBER Working Paper 5057
- [12]. Borensztein, E., J. DE Gregorio and J.W. Lee (1998), "How Does Foreign Direct Investment Affect Economic Growth?" *Journal of International Economics*, Vol. 45, Issue 1, June, pp. 115-135.
- [13]. Caves (1996), *Multinational enterprise and economic analysis* (2nd ed), Cambridge University Press, Cambridge.
- [14]. Dunning, J.H. (1993), *Multinational enterprises and the global economy* Working ham Addison Wesley.
- [15]. Djokoto, J.G. (2011), "Inward foreign investment flows, grow security, and agriculture in Ghana: A Granger causal analysis". *International Journal of Economic and Finance*, 3(6), 188-197.
- [16]. Djokoto, J.G (2012a), "Effect of foreign direct investment inflows into agriculture of food security in Ghana". *Journal of Economics and Sustainable Development*, 3(2), 81-92.
- [17]. Djokoto, J.G. (2012b), "Does causal relationship exist between external external trade and foreign direct investment flow to agriculture in Ghana?" *International journal of Business and Management*, (7), 179-193.
- [18]. Djokoto, J.G and Dzeha. G.C (2012). *Determinants and effects of Foreign Direct Investment in Ghana – Review of Literature*. *Developing Country Studies*. Vol2 No 11, pp25-35.
- [19]. Frimpong, J.M, and Oteng-Abayie, E.F (2008), " Bivariate causality analysis between FDI inflows and economic Growth in Ghana", *International Research Journal of Finance and Economics*, 15,103-112.
- [20]. Gyapong, A.o.&Karikari, J. A(1999), "Direct foreign direct investment strategies and economic performance in Ghana and Ivory coast". *Journal of Economic Development* 24 (1), 1`33-147.
- [21]. Johanson, S. And Juselius, K.(1990). "Maximum Likelihood Estimation and Inference co integration with Application to the Demand for money". *Oxford Bulletein of Economics and Statistics*, Vol 52 pp 169-210
- [22]. Karikari, J.A (1992), "Causality between direct foreign investment and economic output of Ghana". *Journal of Economic Development* 17(1),pp.7-17.
- [23]. Pfeffermann, G. and A. Madarassy, 1992. *Trends in Private Investment in Developing Countries*. The World Bank, Washington, DC USA.
- [24]. Rasak.Adetunji.Adefabi (2011). Effect of Foreign direct investment and Human Capital Development on economic growth in Sub-Saharan Africa. "Medwell Journal of Social Science, volume 8 Issue 1 pp 32-38.
- [25]. Romer, P. M. (1990) "Endogenous technological change". *Journal of Political Economy*. Chicago: University of Chicago Press, Vol. 98, issue 5, p. S71-S102.
- [26]. Solow, R. M.(1957)" Technical change and the aggregate production function. *Review of Economics and Statistics*. Cambridge, MA: MIT Press Journals, Vol. 39, p. 312-320.
- [27]. Swan, Trevor.W (1956), "Economic Growth and Capital Accumulation" *Economic Record*, 32, November, 334-361.
- [28]. Teixeira, A. (1997), *Capacidade de inovação e capital humano. Contributos para o estudo do crescimento económico* Portuguese, 1960-1991, Master Thesis, Faculdade de Economia, Universidad do Porto.
- [29]. UNCTAD (2000). *FDI Determinants and TNC Strategies: The Case of Brazil*. United Nations, New York.
- [31]. UNCTAD (2008), *United Nations Conference on Trade and Development. Foreign direct investment: Definitions and sources*. Available at: <http://www.unctad.org/Templates/Page.asp?intItemID=314&lang=1>.