FOREIGN DIRECT INVESTMENT AND ECONOMIC GROWTH IN ECOWAS: A SYSTEM-GMM APPROACH

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Abstract: The paper investigates the relationship between foreign direct investment and economic growth in ECOWAS using the System-GMM panel estimation technique covering the period 1970-2011.The study adopted System-GMM in order to overcome the weaknesses perceived in the empirical works of earlier studies; majority of these studies failed to control for the presumed challenges of endogeneity inherent in the FDI-Growth argument. The study likewise interacted human capital and institutions indicators with other explanatory variables in explaining the variability of FDI. The results of the System-GMM appears contrary to earlier studies, as the contribution of FDI was insignificant and impacts negatively on growth in ECOWAS despite the controlling for the role of human capital and quality of institutions in the model. Following this outcome, policy makers in developing Africa needs to exercise cautions in adopting the recommendation from earlier studies; most of which advocates more openness, human capital development and the strengthening of institutions. This might not be completely helpful considering the pattern of FDI inflow into ECOWAS, which is absolutely resource-seeking. There is need to curtail excessive openness in the extractive industries, encouraging more manufacturing FDI and domestic investment of repatriated capital by ensuring more economic stability and raising domestic interest rate.

Keywords: Foreign Direct Investment, Economic Growth, System-GMM

JEL Classification: F21, O43, C23

Introduction

The growth and development of a country has been a key research area in economic sciences. It is also a major concern of socio-economic policy making. While the growth of an economy is an aggregate measure of the overall economic activities, development explains the distribution of the resultant growth in the economy. The latter has a correlation with the welfare of the citizenry of the economy. What then are the factors that capture the

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economic development of a nation(s)? Can any economy envisage a sustainable economic development without recourse to external resources? Which policy could be targeted to bring about sustainable economic development?

According to the Wikipedia, economic development generally refers to the sustained, concerted actions of policymakers and communities that promote the standard of living. It could also be seen as the quantitative and qualitative changes in the economy. These include development of human capital, critical infrastructure, regional competitiveness, environmental sustainability, social development including, health, safety and security as well as literacy. In recent times, the controversy over similarity or not between economic development and economic growth reached a peak as people wonder about the usefulness of economic growth without economic progress.

Several authors including Harrod-Domar (1956) and Lewis (1963) have proposed different approaches to the study of economic growth. In particular, Rostow (1956, 1971) develops the concept of the stages of economic development. These are (1) the traditional society, (2) transitional stage, (3) take-off stage, (4) drive to maturity, and (5) high mass consumption. According to Rostow, development requires substantial investment in capital. However, it is the opinion of this paper that most developing African countries do not necessarily move from state to stage but move in a discontinuous no-smooth or jump in a step-wise manner from stage to stage but actually try to summersault apparently from stage 2 to stage 5. This condition is the cruse of the challenges of development in Africa. Thus, it is not sufficient for these economies to grow by the injection of foreign capital, it is necessary that a large dose in the right conditions for such investment be created. It is evident that if aid had been given or foreign direct investment occurred at a stage when the economy has not reached the lower stage and tries to be in higher stage then the economy would be at disequilibrium.

The place of foreign direct investment as source of capital to finance the development of developing countries has been emphasized in the literature (Lucas, 1988; Dunning, 1988; Borensztein, De Gregorio and Lee, 1988; Acemoglu, Aghion and Zilibotti, 2006). It has been variously seen as a means of transfer of technology through the participation of Multinational Companies (MNCs) or direct capital involvement in the economy. In general, foreign direct investment (FDI) should be in the right conditions for it to deliver the expected growth impetus. According to Dunning (1988), the determinant of inflow of FDI to LDCs include market size proxy by GDP, infrastructural development, labour market, degree of openness

measured by the ratio of total trade to GDP, geographical proximity and government policies.

In the context of developing economies, the role of governments can not be overemphasized. It includes maintaining economic and political stability, promoting investment, developing infrastructure and human capital and creating a liberalized and competitive economic environment through regional and extra-regional financial resources.

Thus, to what extent can the economic development of ECOWAS be explained by the inflow of FDI to the sub-region? To what extent can the inflow sustain economic development of the sub-region? The ECOWAS, established in 1975, has metamorphosed from a Free Trade Area (FTA) to custom union (CU) Common Markets (CM) and Economic Union (EU). It includes Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo, as members. It is one of the largest single regional trade groups in Africa.

Therefore, the objective of this paper is to investigate the role of FDI in the appropriate macroeconomic tools such as monetary, fiscal, trade and income policies. In this respect, it is increasingly difficult for countries to achieve an optimal development goal without recourse to other nations. Thus, being a member of a regional trade agreement (RTA) has been identified as an avenue to achieving a country's social, economic and political development. It is believed that countries can benefit from intra-sustenance of economic development in the ECOWAS sub-region. The analysis is based on endogenous growth model and the generalized method of moments (GMM) on a panel of fifteen countries from 1975 to 2010 is used to obtain the estimated parameters of the model.

Following this introductory section, the rest of the paper is arranged as follows: In Section 2, Stylized Facts on the Macro-economy and FDI Inflow into the sub-region is analysed. Section 3 reviews the literature. In Section 4, the paper presents the theoretical and methodology applied in the study while Section 4 presents the results of estimation and discussion of results. Section 6 concludes the paper.

2.0 Stylized Facts on the growth and FDI Inflows to the ECOWAS

Table 1: Trend of FDI, Institutions and GDP Per Capita in ECOWAS

	inflows			Outflows			Pbv			Req			Pci		
	2000	2005	2010	2000	2005	2010	2000	2005	2010	2000	2005	2010	2000	2005	2010
Benin	59.74	53.04	176.8	3.58	-0.38	-17.9	0.36	0.01	0.29	-0.21	-0.57	-0.33	346	357	377
Burkina Faso	23.1	34.2	34.6	0.167	-0.195	-3.53	-0.36	-0.46	-0.27	-0.12	-0.42	-0.13	212	252	283
Cape Verde	43.4	81.6	111.44	0	0	0.14	0.74	0.49	0.89	0	-0.31	-0.04	1233	1482	1959
Cote d'Ivoire	234.7	311.9	338.9	7.87	0	24.9	-1.10	-1.38	-1.12	-0.54	-0.91	-0.91	628	578	588
Gambia	43.52	44.69	37.15		-	-	-1.14	-0.97	-1.08	-0.28	-0.52	-0.39	606	614	704
Ghana	165.9	144.9	2527.4	0	0	7.86	-0.08	0.24	0.51	-0.10	-0.11	0.12	260	294	340
Guinea	9.94	105	101.35		0	0	-1.18	-1.14	-0.93	-0.60	-1.06	-1.08	373	546	550
Guinea-Bissau	0.70	7.99	33.2	0	0.70	5.51	-0.76	-0.37	-0.88	-1.24	-1.12	-1.14	174	154	161
Mali	82.44	223.8	405.9	4.01	-0.94	7.41	-0.11	0.25	0.14	-0.10	-0.57	-0.49	214	250	273
Niger	8.44	30.29	940.32	-0.62	-4.4	59.7	-0.20	-0.28	-0.60	-0.61	-0.42	-0.49	165	168	179
Nigeria	1309.7	4978.26	6098.96	168.9	14.6	-922.9	-0.59	-0.83	-0.79	-0.74	-0.77	-0.72	372	443	540
Senegal	62.9	44.6	266.1	0.65	-7.7	2.23	0.08	0.03	-0.31	-0.13	-0.26	-0.27	494	542	562
Sierra Leone	38.9	83.2	86.6	0	-7.55	4.95	-1.57	-0.52	-0.18	-1.38	-1.08	-0.73	153	234	268
Togo	41.5	76.99	85.8	0.45	-14.87	37.2	-1.22	-1.28	-0.96	-0.66	-0.84	-0.87	270	252	264

Source: compiled by authors from UNTADSTAT, 2011 and WGI 2012

Note: Pbv is an institutional variable which indicates the incidences of violence, Req measures regulatory quality and Pci is GDP Per Capita

Table 2: FDI Statistics and growth rates in ECOWAS

	Fdi inflows US$M			Growth rates			FDI % of GFCF			FDI % of total world		
	2000	2005	2010	2000	2005	2010	2000	2005	2010	2000	2005	2010
Developing Asia	147786.8	218420.4	384063	6.8	7.9	8.5	13.0	10.4	8.1	10.55	22.27	29.34
Developing America	97824.49	78057.3	187400.7	4.4	4.6	5.9	24.6	15.4	19.1	6.98	8.0	14.3
Developing Africa	9671.058	30504.78	43122.14	3.5	5.5	4.0	10.0	17.7	12.2	0.69	3.11	3.29
Sub-Saharan Africa	6813.17	20573	29477.18	3.9	5.6	4.0	13.0	19.4	13.7	0.49	2.10	2.25
Western Africa	2181.94	7117.56	11825.07	3.3	4.0	3.7	20.6	35.7	23.5	0.16	0.48	0.90

Source: compiled by authors from UNCTADSTAT 2011

Total foreign direct investment has increased in the 1980s both in absolute and relative terms. It has also become widely dispersed among outward investors and recipient countries. Total FDI inflows to developing countries increased from 3.5 billion dollars in 1970 to 16.2 billion dollars in 2002. Among developing countries, the distribution of world FDI inflow is uneven.

Following the available statistics on the trend of FDI inflow to Africa, Asia, America and sub-Saharan Africa; it obvious that starting from almost similar levels in the 1970s, annual FDI inflow to Africa lagged far behind Asia and Latin America in recent years . In 1970 for example, the average FDI inflow to Africa was $1 billion compared with $1.6 billion and $3.3 billion in Asia and Latin America and the Caribbean islands, respectively. In 1980s, the amount received by African countries stagnated while the amount received by Latin America and Asia expanded impressively. Consequently, Africa's share of FDI inflow into developing countries decreased from 20 percent in 1970s to 9.8 percent in 1980s and to 5.5 percent in 1990s. Beginning in the 1980s Africa has fallen behind other developing areas in terms of its relative value of FDI inflows. In the 1990s, the gap increased widely when the world wide surge in FDI flows into developing world largely by-passed the region.

Despite the observed differences in regions, FDI inflow into the developing Africa increased from US$9671.058 to US$30504.78 in 2005 representing over 200% rise, the figure further rose to US$43122.14 in 2010 representing over 100%. In the same manner, FDI as percent of gross fixed capital formation has been consistently increasing; likewise the share of developing Africa in the world FDI has consistently maintained an upward trend. The world share of FDI flows to the developing Africa has been consistently rising since the 1990s, totalling amount 450% increase from 2000 to 2010 only while the world share of FDI to the developing Asia and America between 2000 and 2010 were about 178% and 107% respectively. In the same manner, flow to the Sub-Sahara Africa increased to the tune of about 400% in the same period.

Among the West Africa countries, Nigeria attracts the largest share of FDI inflow; which in 2010 was almost twice of all other countries in the region. Likewise, Nigeria has consistently remain one of the economies with the weakest institutions in the region, which is reflected in the dismal performance of her macroeconomic indicators such as retarded growth of living standards, massive poverty, slow per capita growth, high mortality rates, low level of education and many still lack access to basic health treatment.

**Figure 1: Regional FDI inflows (million U.S dollars)**
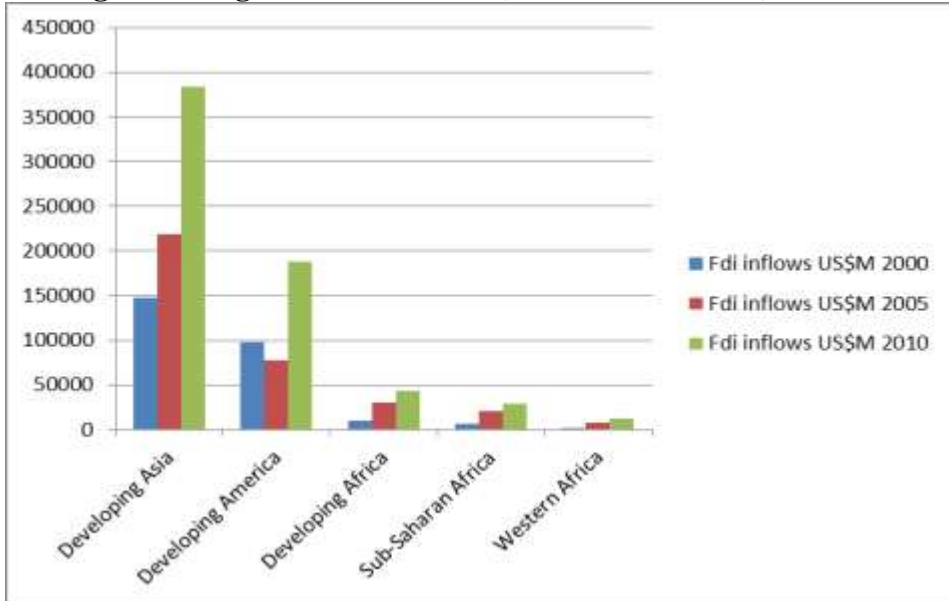
Source: Authors' computation from UNCTAD 2012

The figure shows the relatively small values of FDI inflow into the developing Africa, though the value appears small in absolute terms, but nevertheless, they have greater impact on their economies than what the absolute value suggests. The average share of FDI in gross domestic capital formation was at 9 percent for Africa in 2000 as compared to around 23 percent and 13 percent for developing America and Asia respectively. In 2005, there was a leap in the value of FDI in gross domestic capital formation to Africa to a tune of 22 percent, in the same manner, developing America and Asia experienced a down-turn; though Western Africa received an all time high share of FDI in GFCF representing about 35 percent. The year 2010 experienced a fall in FDI in GFCF across regions, except the developing America where the share FDI in GFCF rose to 18 percent.

Figure 2: FDI inflows as percentage of Gross Fixed Capital Formation
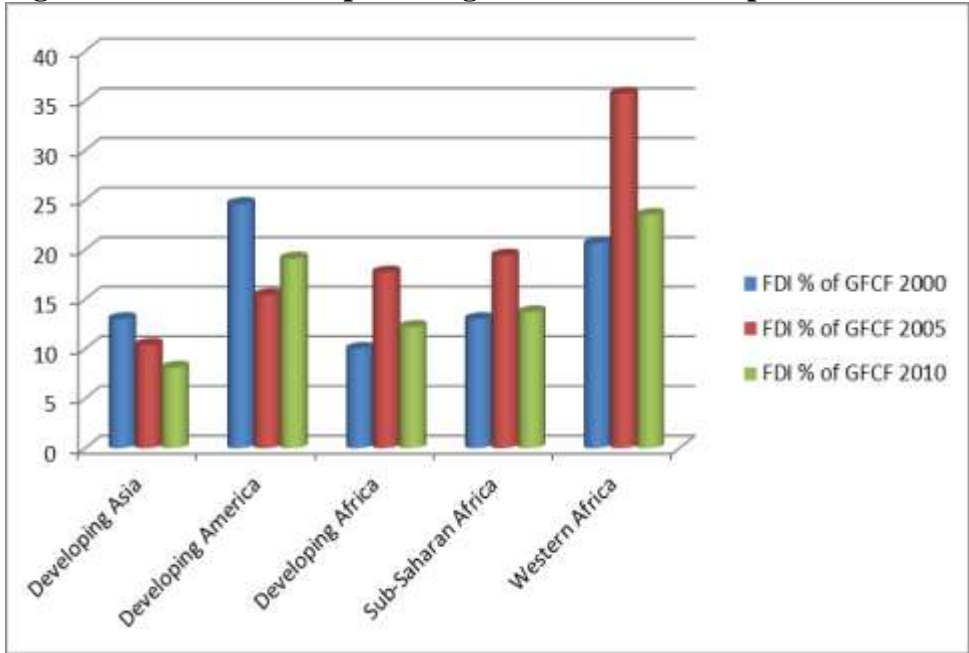
Source: Authors' computation from UNCTAD, 2013

The weak flow of FDI before the 1980's was not unconnected with the hostile policies of the developing countries as regards private sector development which accentuated from the perception to limit foreign participation in major enterprises. Also unstable macroeconomic conditions, weak structural and institutional factors did limit the flow FDI into Africa economies. Africa has received fair amount of FDI, most especially FDI in Nigeria has over-time concentrated in the extractive industries; studies have shown that, though rate of returns is higher for many African countries but the inherent socio-economic challenges has been a major repelling force. Bhattacharya et al (1996) concludes that SSA has received minimal FDI flows because risks are perceived to be higher in SSA when compared to other regions.

Table 3: Global FDI Flow (inward) as a Percentage of GDP (1970-2010)

	1996-99	**2000-04**	**2005-10**	**Average**
World	100	100	100	100
Developing Economies	31.744	27.248	36.534	31.842
Developed Economies	66.901	69.011	64.516	66.809
Africa	1.607	2.474	3.993	2.691
America	24.785	18.833	17.707	20.775
Asia	18.606	16.871	22.472	19.316
Europe	39.112	46.152	37.939	41.068
LDCs	0.644	1.315	1.753	1.244

Source: Author's Computation from UNCTADSTAT, 2011

From the Table 3 above, developed economies had continually had the largest share of the global flow. The reasons attributed to this cannot be far fetched from the well developed and organized infrastructures as well as stable government policies which could be considered as major determinants of FDI. It is not surprising why the developing countries were only able to attract about 32 per cent of the total flow despite the existing policies to attract FDI inflow. Another reason could be linked to their inability to adequately provide pre-requisite determinants of FDI (i.e. infrastructure, well-functioning institutions, and stable policies to mention but few).

Classifying the flow into regions, Europe recorded the lion share. It recorded an overall 41 per cent of the total flow. This is followed by America, all through the period under study; its share had been relatively stable with an overall average of about 21 per cent. The existence of the Asian Tigers leaped the Asian region to record about 19 per cent.

The distribution of the flow has been biased against Africa. This pattern remains palpable in spite of policy initiatives in a number of African countries and the significant improvements in the factors governing FDI flows. These factors include, but are not restricted to, economic reform, democratization, privatization and enduring peace and stability. The possible reason for this can be related to the fact that FDI flow to countries in the region which can boast of natural endowments (Oil and Agricultural product). Therefore, this means that major FDI inflows into Africa are resource seeking FDI.

3.0 Review of the Literature

The widening growth disparity arising from FDI inflows into developing countries have created much interest among economists. The literature has witnessed a large body of theoretical and empirical debate on the impact of FDI on economic growth resulting in mixed evidences. According to theory, FDI benefits the host country by transferring resources, increasing employment opportunities, improving balance of payments and transferring technology (Suker A; Caveron S.A , Murray S.H; 2004). Several authors concluded that FDI brings much needed physical capital, new technology, managerial and marketing talents and expertise, international best practises of doing business as well as increased competition (Findlay 1978, Lall 1974, Loungani 2001 and Razin and Romer 1999).

The importance of FDI to a nation's investment development path was first proposed by Dunning in the early eighties and has then been visited by several authors. According to Gorynia M; Nowak J; and Wolniak R (2010); the inward and outward foreign investment position of a country is tied with its economic development. Changes in volume and structure of FDI lead to different values in the country's net outward investment (NOI) position. As the economy development expands, the NOI position first falls and thereafter demonstrates a tendency to fluctuate around zero but usually with both inward and outward FDI increasing.

A number of researches have highlighted the role of foreign direct investment in the technological progress of developing countries. Findlay (1978) postulates that foreign direct investment increases the rate of technical progress in the host country through a contagion effect from the more advanced technology, management practices etc used by the foreign firms.

Nigeria has consistently attracted FDI over the years, its FDI inflow was estimated at US$2.23billion in 2003 and rose to US$5.31billion in 2004 representing 38percent increase; the figure further rose to US$9.92billion representing 87percent. Though, Nigeria received more FDI more than all other ECOWAS countries, there have been significant FDI attraction in the ECOWAS region but the major concern is if the FDIs actually contribute to economic development in Nigeria and ECOWAS at large, if it does; the sustainability of FDI would be worthwhile and synonymous to the sustainability of the ECOWAS economy (Egwaikhide 2012). From the foregoing arguments, the African economies and most especially Nigeria can create a new Investment Development Path via FDI inflow; as the economies is undoubtedly facing an economic crisis situation featured by inadequate resources for long-term development, high poverty level, low capacity utilization, high

level of unemployment and insecurity (Funke and Nsouli 2003).

The Nigerian economy resources and market potential has placed the economy among the top three leading African countries that consistently received FDI in the past decades; despite this, the empirical linkage between FDI and economic growth appeared not cleared. Emerging research interest in FDI ignites from the perspective change among policy makers; until recently policy makers were more hostile to FDI inflow especially among developing countries due to its perceived negative consequences. Foreign direct investment was seen as parasitic and retarding the development of domestic industries for export promotion (Egwaikhide 2012). Caves (1996) observed that the rationale for increase efforts to attract more FDI stems from the belief that FDI has several positive effects. The positive effects include productivity gain, technology transfers, and the introduction of new processes, managerial skills and know-how in the domestic market, employee training, international production networks, and access to markets. Carkovic and Levine (2002) notes that the economic rationale for offering special incentives to attract FDI frequently derives from the belief that foreign direct investment produces externalities in the form of technology transfers and spillovers.

Foreign direct investment provides much needed resources to developing countries such as capital, technology, managerial skills, entrepreneurial ability, brand and access to markets which are essential for developing countries to industrialize, develop, create jobs and attack the poverty situation in their countries (Althukorale 2003). Likewise, Dauda (2007) sees FDI as a growth propelling force in developing countries; as it makes significant contributions to the host country's development process especially through easing of the constraints of low levels of domestic savings and investment as well as foreign exchange shortages.

Empirical evidences on the link between FDI and economic growth have been inconclusive; with some empirical works suggesting a positive effects of FDI on economic growth (Bosworth and Collins (1999); Blomstorm et al (2000); Lan N.P., 2006; Radoslaw et al 2010; Zhang (2001); De mello (1997); Obwona (2001); Ayanwale (2007); likewise, there are empirical evidence suggesting a marginal contribution of FDI to economic growth (Abdulhamid et al 2004; Lee J-W et al 1997; Akinlo 2004) while a very few literature found an inverse effects of FDI on economic growth (Oyinlola 1995; Ariyo 1998). However, the growth stimulating effect of FDI is not automatic; it depends on several country specific factors such as the absorptive capability (skills) of the human capital, the quality of institutions, infrastructural development, among others. Studies have found that the

in panel data estimation. In multivariate dynamic panel models, the System-GMM estimator is also positive effect of FDI is stronger the higher the level of development of a host country.

Abdulhamid et al (2004) examined the effect of foreign direct investment on economic growth in 12 sub-Saharan Africa countries using a panel data analysis covering the period 1975-1999 found foreign direct investment to have a marginal significant positive effect on economic growth. Similarly, Lee J-W (1997) found FDI to exert a positive, but not strong, effect on domestic investment. In the same manner, FDI was found to have a positive overall effect on economic growth but the magnitude largely depends on the stock of human capital available in the host country, likewise Borensztein (1998) found education attainment and financial market development as important determinants of foreign direct investment. Ayanwale (2007) investigates the empirical relationship between non-extractive FDI and economic growth in Nigeria using 2SLS for the period 1970-2002 and found the overall effect of FDI on economic growth not to be significant, though some components of FDI do have a positive impact. The FDI in the communication sector has the highest potential to grow the economy; the manufacturing sector FDI negatively affects the economy reflecting the poor business regulatory

environment in the country. Among the dependents of FDI, openness to trade and human capital appears not to be FDI inducing.

Akinlo (2004) investigated the impact of foreign direct investment on economic growth in Nigeria by controlling for the oil and non-oil FDI dichotomy using the Error Correction Model (ECM) and found both private and foreign capital to have a minimal and insignificant effect on growth. The study hereby supports the argument that extractive FDI might not be growth enhancing as much as manufacturing FDI. Likewise, Oyinlola (1995) using Chenery and Stout's two-gap model concluded that FDI has a negative effect on economic development in Nigeria.

A common weakness that has been widely witnessed in the earlier studies is that they failed to control for the problem of endogeneity in accessing the relationship between FDI and economic growth. The study attempts to evaluate the relationship between foreign direct investment and economic growth using the regular pooled panel data analysis, the fixed and random effect estimation and the generalized method of moments in order to compare results with earlier empirical works. The focal aspect of the estimation process is the use of the generalized method of moments which is capable of handling the problem of endogeneity, since both FDI and GDP are endogenous in the FDI-Growth equation.

$$Y = f[L, K_p, K_f, E] = AL^{\alpha} K_p^{\beta} E^{(1-\alpha-\beta)}$$

4.0 The Methodology

According to Romer (1986), the essence of foreign direct investment can be seen as closing the capital gap, as the main obstacle facing developing countries is catching-up with the advanced ones. FDI can be analytically linked to growth through its impact on productivity of both domestic labour and domestic capital (Chukwu et al 2012). Following the empirical studies of Fedderke and Romm (2006); Chukwu et al (2012); Ramirez (2000) and De Mello (1997), the analytical framework that links FDI to economic growth can be analyzed using the augmented Cobb-Douglas production function stated as follows:

Where Y is the real GDP, K_p is the domestic capital, K_f is foreign capital, L is labour and E refers to the externality or spillover effect generated by the additions to the stock of FDI. α and β are the shares of domestic labour and capital respectively while A captures the efficiency of production.

This paper hereby draws its empirical model in the spirit of Romer (1986) using the endogenous growth in a panel framework and thus postulate that the relationship between economic development and its various determinants is an implicit function of the form:

$$YK_{it} = f(KAP_{it}, LAB_{it}, FDI_{it}, X'_{it}) \tag{1}$$

Where

$$(X_{it})' = (HKA_{it} \; DDI_{it} \; OPN_{it} \; INF_{it} \; PBV_{it})$$

It is assumed that the relationship between the dependent variable and the independent variables is nonlinear. Therefore, the explicit form of the model can be written as follows:

$$YK_{it} = AKAP_{it}^{\alpha_1} LAB_{it}^{\alpha_2} FDI_{it}^{\alpha_3} HKA_{it}^{\alpha_4} DDI_{it}^{\alpha_5} OPN_{it}^{\alpha_6} INF_{it}^{\alpha_7} . e^{\alpha_8 PBV_{it}} \tag{2}$$

In estimating the parameters of the model in equation (2) using OLS technique, the equation has to be log transformed. The resulting equation is as follows:

$$LYK_{it} = \alpha_0 + \alpha_1 LKAP_{it} + \alpha_2 LLAB_{it} + \alpha_3 LFDI_{it} + \alpha_4 LHKA_{it} + \alpha_5 LDDI_{it} + \alpha_6 LOPN_{it} + \alpha_7 LINF_{it} + \alpha_8 PBV_{it} + \mu_t \tag{3}$$

where, YK_{it} is the GDP per capita, FDI_{it} is the foreign direct investment in country i at time t, KAP_{it} is the stock of capital in the economy in country i at time t, LAB_{it} is the labour force in country i at time t, HKA_{it}: human capital measured by enrolment in primary and secondary school, DDI_{it} is domestic investment at time t in country i, PBV_{it} is

regulatory quality in country i at time t, OPN_{it} is degree of openness of country i in time t, INF_{it} is inflation rate in country i at time t to measure macroeconomic stability.

Equation (2) above incorporates an indicator of governance (political stability and violence) and needs not to be logged due to large presence of negative values in the series, in order to avoid heavy lost of data, the variable is taken in a natural logarithm form; therefore, in an attempt to log-linearized the model, the variable returns to its level state. X_{it} contains fundamental determinant of growth, institutional variables macroeconomic stability, external trade and domestic financing designed to capture economic development.

The Cobb-Douglas nature of the model justifies the inclusion of labour and capital in the model. Controlling for the role of human capital in the FDI-growth nexus have been widely justified in the literature. Abdulhamid et al (2004) proposes that higher productivity of FDI holds only when the host country possesses a minimum threshold of stock of human capital. We therefore expect the parameter α_4 to take a positive sign; this is in line with Chukwu et al (2012) and theories of human capital development which postulates that the better the quality and supply of human capital, the greater the productivity level. The parameter α_8 is also expected to be positive, Ekpo (1995) identified political regime

among other factors as key in explaining variability of FDI inflow likewise Globerman, Shapiro and Tang (2004); Brusse and Griozaro (2006) found good governance as relevant in the FDI and growth relationships and governance as a major determinant of FDI respectively. The expected sign of the parameter α_6 may be negative or positive, that is; openness can harm or accelerate the growth progress depending on the development stage of the economy. According to Chukwu et al (2012); the impact of government consumption depends on its crowding out effect; when government expenditure crowds out private consumption α_6 will be positive; otherwise, it will be negative. The parameter α_7 representing the coefficient of inflation rate is expected to be negative, as stable macroeconomic policy has been adjudged to be FDI inducing (Ayanwale, 2007).

4.1 Technique of Estimation

This paper adopts a technique of estimation that allows us to address the triple-problem of endogeneity of the regressors, the measurement error and omitted variables (Cozmanca and Manea 2009). In the literature, these problems have been jointly addressed by the use of panel data methods of estimation. One of such methods is the dynamic model of the first-differenced equation estimated by the Generalized Method of Moments (GMM) approach proposed by Holtz-Eakin, Newey and Rosen (1988) and developed by

Arrelano-Bond (1991) and commonly known as "Difference" GMM. According to Ojo and Alege (forthcoming), this method has a problem in estimating the persistent time series and more importantly when the sample size is small, the method performs poorly. Hence,

attention has been drawn to an alternative panel data method known as "System" GMM. The latter is developed by Arellano-Bover (1995)/Blundell-Bond (1998).

Re-writing our model in GMM econometric form, we have:

$$yk_{it} - yk_{it-1} = \alpha(yk_{it-1} - yk_{it-2}) + \beta(fdi_{it} - fdi_{it-1}) + \gamma(X_{it} - X_{it-1}) + (\varepsilon_{it} - \varepsilon_{it-1})$$

or

$$\Delta yk_{it} = \alpha \Delta yk_{it-1} + \beta fdi_{it} + \gamma \Delta X_{it} + \Delta \varepsilon_{it}$$

The Arellano-Bond (1991) method is all about the dynamic variant of equation 1 above that allows us to explicitly take into cognizance the fact that the determinants of exchange rate are either pre-determined or endogenous or both and that the dependent variable itself could depend on its past realizations. The dynamic form of the equation can thus be written as follows:

$$\Delta Y_{it} = \alpha \Delta Y_{it-1} + \beta \Delta X_{it-1} + \gamma Z_{it} + \upsilon_i + \varepsilon_{it}$$

where ΔY_{it} is the first difference of the natural logarithm of the dependent variable in country i at time t; ΔY_{it-1} is the lagged difference of the dependent variable, ΔX_{it-1} is a vector of lagged level and differenced pre-determined and endogenous variables; Z_{it} is a vector of endogenous variables; and α, β and γ are parameters to be estimated. The term υ_i and ε_{it} are assumed to be independent over all time period in country i. The country

specific effects υ_i and the stochastic term ε_{it} are as defined in equation above. It is known that this method provides the opportunity of controlling for potential bias occasioned by the endogeneity of some of the regressors.

The problem of endogeneity that is often associated with the use of panel data will be resolved by the use of the system GMM estimator to estimate the relationship between FDI and growth. System GMM estimator eliminates any bias that may arise from ignoring dynamic endogeneity and also provides theoretically based and powerful instruments that accounts for simultaneity while eliminating any unobservable heterogeneity (Davidson and Mackinnon, 2004). The good performance of the System GMM estimator relative to the Difference-GMM estimator in terms of finite sample bias and root mean square error has made it preferable known to perform better than the

Differenced GMM when series are persistent and there is a dramatic reduction in the finite sample bias due to the exploitation of additional moment conditions (Bun and Windmeijer 2009; Blundell, Bond and Windmeijer, 2000).

In view of the obvious strengths of the Blundell and Bond's (1998) extended version of the GMM estimator (known as the System-GMM estimator) in overcoming complications that may arise from efforts to estimate the usual linear dynamic panel data models; it's therefore considered appropriate and applied in this study.

4.2 Data Sources and Measurement

The data set used in this paper refers to a panel of fifteen ECOWAS countries covering the period 1990 – 2011. The data used for the study were sourced from the World Development Indicators of the World Bank. The variables included for the study include the GDP per capita, capital stock, labour force, foreign direct investment, human capital, political stability and violence, domestic investment, openness and inflation. The study adopts the Generalized Method of Moments (GMM) estimation technique, with the view to compare the reliability of the result obtained with the earlier studies; likewise, the choice of GMM would be more appropriate in overcoming the weaknesses of the estimation techniques adopted by earlier studies, as those techniques are inappropriate in handling the problem of endogeneity inherent in the FDI-Growth relationship.

Table 4: Date Sources and Measurement

Variable	Description	Source	Measurement
yk	GDP per capita	World Development Indicators (WDI) of World Bank	Constant US$
kap	Capital stock	WDI	Constant US$
lab	Labour force	WDI	Number
fdi	Foreign Direct Investment	WDI	Constant US$
hka	Human Capital	WDI	Number
pbv	Political Stability and violence	WDI	Rate
ddi	Domestic Investment	WDI	Constant US$
opn	Openness	WDI	Percentage
inf	Inflation	WDI	Rate

4.3 Preliminary Data Analysis

Table 5 reports the summary statistics for the variables used in the empirical model. It reports the mean, standard deviation, minimum and maximum values for the variables for all the countries of ECOWAS. The mean value of GDP per capita income is calculated as US$404.89 for all ECOWAS countries; this figure differs from what is obtainable in some ECOWAS countries. The region is made of some countries with higher GDP per capita of above US$1000 such as Cape Verde, some around US$500 such as Cote d'Ivoire, Gambia while others have barely above US$200. The mean of other variables can be analyzed in the same manner; the foreign direct investment as per of GDP is quite minimal in ECOWAS, largely due to a marginal inflow of Foreign investment into ECOWAS region.

Table 5: Descriptive Statistics of Variable

Variable	Yk	kap	Lab	fdi	hka	pbv	ddi	opn	inf
Mean	404.89	6.12e+08	5813440	2.424314	2392684	-0.41827	18.7349	0.72093	8.86933
Std. Dev	296.68	9.01e+08	9776471	2.801499	5542209	0.86624	8.71378	0.34911	13.28518
Min	151.57	7.01e+07	117052.9	-2.13816	0	-2.38	3.48003	0.29595	-7.79664
Max	1958.88	7.01e+09	5.03e+07	17.50063	2.97e+07	1.12	48.3967	2.58850	72.8355
obs	294	241	294	289	294	168	253	267	259

Source: Computed by authors using Stata 11.0

Table 6: Correlation matrix

	lkap	Llab	lfdi	lhka	pbv	lddi	lopn	linf
Lkap	1.0000							
Llab	0.7176	1.0000						
Lfdi	0.0574	0.0479	1.0000					
Lhka	0.7817	0.9487	0.1875	1.0000				
Pbv	-0.0188	-0.4913	0.1419	-0.5750	1.0000			
Lddi	0.3457	-0.1935	0.1814	-0.0881	0.4739	1.0000		
Lopn	0.4012	0.1558	0.2712	0.3105	-0.0448	0.2866	1.0000	
Linf	-0.0144	0.1499	0.1233	0.2059	-0.2170	0.1890	0.0780	1.0000

Source: Computed by authors using Stata 11.0

Table 6 presents the correlation matrix for the variables in the model; an incidence of strong correlation among the independent variables may violate the working assumptions of our estimation technique and hereby produce an unrealistic results. Here, we test for the likely occurrence of multi-collinearity among the independent variables using the pairwise correlation matrix. The table indicates a positive weak correlation between lfdi and other independent variable in the model; this is similar for all other cases of independent variables except for llab and lhka, and lkap and lhka respectively. The correlation coefficients for these two sets are high, though, not perfect. This is due to the fact that labour force (llab) and human capital (lhka) share similar attributes. An overall consideration of the result of the correlation

coefficients indicates that multicollinearity is not a considered

5.0 Discussion of Result

The results from the estimated model are presented in the table above; the table contains the combined pooled regression results, the OLS results

problem in the model to be estimated.

for the Nigerian economy, the OLS results for other ECOWAS countries, the panel fixed effects, the random effects and the generalized method of moments result for ECOWAS.

Table 7: Estimation of Results

	POLS	NOLS	OOLS	FE	RE	GMM
Lkap	0.4908	0.0554	0.5052	0.0539	0.1832	-0.0575
	(8.47)	*(1.51)*	*(9.23)*	*(1.16)*	*(3.68)*	*(-1.99)*
llab	-0.6944	-0.6129	-0.6784	0.3244	-0.2810	0.7228
	(-5.64)	*(-3.79)*	*(-5.85)*	*(2.16)*	*(-2.39)*	*(7.50)*
lfdi	0.1962	0.2244	0.1360	0.0214	0.0357	-0.0070
	(4.97)	*(4.06)*	*(3.21)*	*(1.77)*	*(2.46)*	*(-1.13)*
lhka	-0.0518	0.3669	-0.1495	0.0242	0.0895	0.0854
	(-0.42)	*(2.30)*	*(-1.21)*	*(0.45)*	*(1.42)*	*(3.30)*
pbv	-0.1569	-0.1686	-0.1602	0.0446	0.0116	0.0319
	(-2.88)	*(-2.31)*	*(-3.07)*	*(1.62)*	*(0.36)*	*(2.41)*
lddi	-0.2863	--	--	-0.0248	0.0250	-0.0509
	(-2.11)	--	--	*(-0.58)*	*(0.50)*	*(-2.71)*
lopn	-0.3760	-0.0083	-0.2971	0.0763	-0.1085	0.2420
	(-4.19)	*(-0.07)*	*(-3.41)*	*(1.04)*	*(-1.37)*	*(4.85)*
linf	0.0134	-0.0335	-0.0123	-0.0018	-0.0066	0.0082
	(0.40)	*(-0.74)*	*(-0.38)*	*(-0.17)*	*(-0.49)*	*(2.26)*
con	7.6811	8.7483	8.9172	-0.0425	5.0699	-4.366
	(11.05)	*(9.52)*	*(10.55)*	*(-0.03)*	*(5.00)*	*(-4.69)*
r^2	0.82	0.57	0.82			
ar^2	0.8	0.53	0.80			
F-test	40.78	16.07	41.61	10.31		
H-test						
FE-test				114.65		
Countries included						
	15	1	15	15	15	15

Note: POLS is the ordinary pooled regression for ECOWAS

NOLS is the ordinary least square regression for Nigeria

OOLS is ordinary pooled regression for ECOWAS

FE is fixed effect model for ECOWAS

RE is random effect model for ECOWAS

GMM is generalized method of moments for ECOWAS

The pooled OLS regression results indicate a significant inelastic relationship between FDI and GDP per capita. This implies that FDI accelerates the level of GDP per capita in ECOWAS. Here, the responsiveness of GDP per capita to

change in FDI is slow, as a proportionate change in FDI will cause a lesser proportionate change in GDP per capita. This nature of relationship is likely due to the insignificance and almost perfectly inelastic influence of human capital

on the FDI-Growth nexus (see Nelson and Phelps 1996; Benhabib and Spiegel 1994). In the same manner, other explanatory variables also induce a significant inelastic variation on GDP per capita except for inflation rate which appears statistically insignificant.

Since Nigeria is the highest FDI receiving country, accounting for over 54 percent of ECOWAS FDI inflows in 2010; our analysis attempt to disaggregate the impact of FDI on the Nigerian economy separately from other ECOWAS nations. In the case of Nigeria, we found that the responsiveness of real GDP per capita to a change in FDI rises as human capital improves and as the economy becomes stable. The results indicate a positive and larger coefficient of FDI as the indicator of human capital becomes significant. From the results obtained for other ECOWAS countries, the responsiveness of GDP per capita to FDI drops as stock of human capital becomes insignificant; likewise in the fixed effect and random effect estimation, the responsiveness of GDP per capita to FDI become worsen as the indicators of human capital and governance become insignificant. From the foregoing analysis, it becomes evident that human capital development and good governance (in terms of political stability and absence of violence) are essential control factors in explaining the relationship between foreign direction investment and GDP per capita income.

The results of the generalized method of moments seem to be entirely unique, as compared to what was obtained in other estimation techniques in this study and earlier studies. The indicator of FDI exerts a negative and nearly perfect inelastic variation on GDP per capita; though human capital and governance indicators are significant. This implies that foreign direct investment failed to contribute meaningfully to ECOWAS economies despite enhanced human capital, trade openness and sound governance. This result support the claim that the majority of ECOWAS foreign direct investment are resource-seeking; as the extractive industries consistently received majority of ECOWAS foreign investment.

6.0 Recommendation and Conclusion

The paper attempts to investigate the relationship between foreign direct investment and economic growth in ECOWAS for the period of 1990-2011 using the generalized method of moments technique of estimation. The choice of the estimation technique was adopted to overcome the weaknesses in the empirical works of earlier studies, as majority of the earlier studies failed to control for the presumed bi-directional relationship between economic growth and FDI inflows. According to theory, GDP and FDI are endogenous in the specified model above; this implies that FDI stimulates growth and more growth also encourages more FDI.

Therefore, there is a positive feedback nature of relationship between growth and FDI or what is generally referred to as the problem of endogeneity.

The empirical analyses considers other estimation techniques (such as pooled OLS, Fixed effects and Random effects) as used in the earlier studies and found similar results; suggesting a positive linear relationship between foreign direct investment and economic development depending on the significance level of human capital and governance indicators. That is, the degree of responsiveness of GDP per capita to a change in FDI depends on the absorptive capability of the available human stock, extent of openness, the political and economic stability of ECOWAS countries. Conversely, the result obtained from the GMM technique of estimation seems very unique, as the contributions of FDI appear insignificant in the dynamism of GDP per capita of ECOWAS despite the significant contributions of the control variables.

From the foregoing analysis, the recommendations of the earlier studies suggesting more trade openness, provision of legal and administrative framework, advancing the human capital stock might not be completely helpful in accruing the benefits of FDI; since the pattern of FDI inflows into ECOWAS is largely resource-seeking, accounting for the reason why Nigeria has consistently received more than half of the FDI inflows into ECOWAS. The policy makers needs to curtail on excessive openness in the extractive industries, most especially oil and gas; as unrestricted openness could do more harm in import dependent economies of ECOWAS. Likewise, policies to encourage domestic investment of repatriated capital, possibly by ensuring economic stability (low inflation rate) and raising domestic interest rate. In the same manner, government needs to implement policies that encourage FDI inflows into heavy labour industries such as manufacturing, telecommunications and infrastructural enhancing industries such as services.

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