Foreign Direct Investment, Economic Growth and Financial Sector Development in Small Open Developing Economies

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Abstract: The present paper examines the causal linkage between foreign direct investment(FDI) and economic growth - in Cote' d'Ivoire, Gambia, Ghana, Nigeria and Sierra Leone - with financial development accounted for over the period 1970-2005 within a trivariate framework which applies Granger causality tests in a vector error correction(VEC) setting. Three alternative measures of financial sector development - total liquid liabilities, total banking sector credit and credit to the private sector - were employed to capture different ramifications of financial intermediation. Our results support the view that the extent of financial sophistication matters for the benefits of foreign direct investment to register on economic growth in Ghana, Gambia and Sierra Leone depending on the financial indicator used. Nigeria, on the other hand, displays no evidence of any short- or long-run causal flow from FDI to growth with financial deepening accompanying. In sum, therefore, what should be of utmost urgency is concerted efforts in most of these countries, which have typically been in the throes of economic reforms, to upgrade their financial structure to better position them to reap the desirable growth promoting effects of FDI flows.

I. INTRODUCTION

Myriads of opinions exist on the importance of foreign direct investment (FDI most times after here) for economic growth. The standard view, however, appears to provide support for the existence of a close association between investment and economic prosperity. FDI can positively affect growth by an outward shift in the economy's production possibilities frontier

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typically via new technology transfer and spillover efficiency (Blomstrom *et al*. 1994, Kokko and Blomstrom 1995, Mansfield and Romeo 1980, and Kokko 1994). However, developing countries, especially those in sub-Saharan Africa (SSA), witnessed systematic declines in investment rates from the early 1980s (Oshikoya 1994). For most of these countries, particularly those in ECOWAS[2], the lower investment rates have arguably precipitated poor economic growth. The growth rate of real per capita GDP was negative, in the 1980s and 1990s, for instance, for the majority of SSA economies (Ndikumana 2000).

The issue of concern has been the need for a better understanding of the channels through which FDI works to impact economic growth positively (Lemi and Asefa 2003). The received wisdom appears to be that the influence arises from the absorptive capacity of the FDI-receiving country rather than some automatic adjustment of economic growth to changes in the levels of FDI. However, this absorptive capacity has been viewed from diverse lenses in the literature. Most studies have essentially attempted to explain this capacity in terms of commercial policies and human capital (see, for instance, Balasubramanyam *et al*. 1996 and Borensztein *et al*. 1998). Attention in recent times seems to have shifted to the role of the recipient economy's financial market in the FDI-Growth nexus[3] (see Alfaro *et al*. 2004, Choong *et al*. 2004, Hermes and Lensink 2003 and Omran and Bolbol 2003 for insightful discussions on this line of research).

Based on the foregoing, a number of interesting questions come to mind videlicet: To what extent does FDI influence growth in ECOWAS countries? Is there any role for the domestic financial market? Are individual countries unique in terms of the FDI-growth association with financial development intervening?. Thus, the core aim of this inquiry is to examine the relationship between FDI and economic growth, while controlling for the plausible impact of the degree of financial sector sophistication.

Although quite a number of extant studies have dealt with some aspects of this issue, the present study is distinct on a few counts. One, this article takes an inventive look at the FDI-growth-financial development linkage. As far as we know, empirical works on this tripartite relationship are hardly available with specific reference to a group of ECOWAS countries. Two, since a country-by-country time-series approach is adopted[4], policy prescriptions are more likely to be based on evidences peculiar to each country. This is undoubtedly more useful

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[2]   The Economic Community of West African States (ECOWAS) is a regional group of fifteen countries which was founded in 1975 with the mandate of promoting economic integration via the primary objectives of improved economic competitiveness through open and competitive markets, convergence of macroeconomic policies, creation of a common market, sectoral policy coordination as well as harmonization of fiscal policies. Its overriding focus remains the achievement of collective self- sufficiency for the member states, within this single trading bloc, by means of an economic and monetary union.

[3]   On a theoretical basis, the financial sector has a significant bearing on the pattern of long-run economic growth particularly through the impact of financial sector services on both capital accumulation and innovations with respect to technology. These financial sector services include, but are not limited to, savings mobilization, acquisition of information about opportunities for profitable investments, monitoring of managers, exerting corporate control as well as the facilitation of risk amelioration.

[4]   It is noteworthy, at this juncture, that the preponderance of earlier studies on the subject used cross- section approaches in their analysis. However, the estimates emerging from such cross-country growth regressions more often than not disregard important intervening country-specific factors. Hence, a proper assessment of causal relationships in a dynamic sense, which time-series techniques are well suited to capture, is required to unearth the causal linkages among the variables of interest. This, of course, is with a view to enhancing understanding on the linkages between FDI and growth (with financial development intervening) especially on an individual country basis.

than the somewhat misleading generalisations across regional groupings pervasive in the empirical literature. Finally, the use of multiple measures of financial development might have far-reaching implications for which elements of the financial sector to focus on in individual countries if sustained growth is to be achieved.

As a foretaste of the ensuing results, economic growth and foreign direct investment are only causally related when (i) total size of the banking sector is used as the intervening financial indicator in both Gambia and Ghana; (ii) credit to the private sector is adopted in Ghana but not in Sierra Leone; and (iii) the financial indicator seems not as important as the destination sector of FDI flows to Nigeria. Thus, any policy recipe should accordingly keep potential heterogeneity among these countries in focus.

Thus, this paper investigates how financial sector development influences the FDI-growth relationship in five ECOWAS countries over the period 1970-2005.[5] The rest of the paper is structured as follows. Sequel to this introductory discussion, Section "Stylized Facts on FDI, Growth and Financial Sector Development in Selected ECOWAS Countries" presents the trends in FDI, growth and the extent of financial system advancement in the sampled countries. Section "A Brief Literature Review" contains a review of the literature on the FDI-growth linkage, while section "Measurement, Data Sources and Econometric Methodology" details the data sources and econometric approach employed. The results are presented and discussed in section "Empirical Findings and Discussion", while the sixth and final section concludes.

II. STYLIZED FACTS ON FDI, GROWTH AND FINANCIAL SECTOR DEVELOPMENT IN SELECTED ECOWAS COUNTRIES

This section first delves briefly into a description of observed trends in global FDI flows before a detailed narrative of the trends in FDI, economic growth and financial development in the selected ECOWAS countries is undertaken. This portrayal is the preoccupation of what follows.

2.1 FDI Flows in a Global Context

Although, as *Table 1* makes clear, the larger chunk of global FDI flows were destined for the richer countries, the portion domiciled in developing countries undulated around 30 per cent on average between 1991 and 2002. In particular, the 1990s witnessed significant increases in the flow of foreign direct investment to developing countries of the world. However, the balance of evidence still appears to support the conclusion that the inflow has been uneven. 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, democratisation, privatisation and enduring peace and stability. Some explanations have, however, been given in the literature for Africa's small

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[5]   The ECOWAS countries selected for use in this study are namely Cote'd'Ivoire, Ghana, Gambia, Nigeria and Sierra Leone. Annual time-series observations on the key variables of interest were obtained over the period 1970 to 2005 for each country. The availability of consistent data informed the choices of both the sample period and countries.

share in the global FDI flows. These explanations range from bias against Africa because of its risks to the adoption of inappropriate policies among other identified factors.

Table1: Share of Global Foreign Direct Investment inflows, 1991-2002
(in percent)

	1991-96	1997	1998	1999	2000	2001	2002
World	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Developed countries	60.80	55.96	68.84	76.42	80.44	71.54	70.69
Developing countries	35.98	40.10	27.88	21.25	17.66	25.42	24.90
Africa	1.81	2.21	1.30	1.13	0.61	2.28	1.69
Latin America and Caribbean	10.64	15.20	11.96	10.03	6.85	10.16	8.60
Asia	23.36	22.64	14.57	10.06	10.20	12.96	14.59
Pacific	0.16	0.04	0.05	0.03	0.01	0.02	0.02
Central and Eastern Europe	3.22	3.95	3.28	2.33	1.89	3.04	4.41
LDCs	0.67	0.71	0.67	0.55	0.25	0.68	0.80

Sources: The figures displayed were largely culled from UNCTAD (2003) and Ajayi (2006)

To further reinforce the foregoing line of argument, a closer glance at the data also reveals some regional disparities in FDI flows even across developing countries. While Asia as well as Latin America and the Caribbean, as seen from *Table 2*, jointly accounted for about 94 per cent of the aggregate flows to all developing countries in the period 1991-1996 with Africa receiving a meagre 5.0 per cent. Also striking is the slump in the share of Africa from 5.3 per cent to 3.5 per cent between 1999 and 2000 before eventually settling at around 7 per cent in 2002.

Table 2: Share of FDI Flows to developing countries by Region, 1991-2002
(in percent)

	1991-96	1997	1998	1999	2000	2001	2002
Developing countries	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Africa	5.03	5.52	4.67	5.33	3.45	8.96	6.78
Latin America and Caribbean	29.58	37.92	42.89	47.21	38.75	39.98	34.55
Asia	64.93	56.46	52.27	47.33	57.75	50.98	58.58
Pacific	0.45	0.10	0.17	0.12	0.05	0.08	0.09
Central and Eastern Europe	8.94	9.85	11.75	10.97	10.72	11.94	17.71
LDCs	1.84	1.76	2.39	2.61	1.39	2.69	3.23

Sources: The figures displayed were largely culled from UNCTAD (2003) and Ajayi (2006)

With particular reference to growth, the record in Africa, on average, has been at best less than modest. Even the decade of the 1980s has often been appositely labelled as a "lost" one for the majority of countries in the continent. The scarcity of the necessary capital flows for sustained economic growth has been pinpointed as one major clog in the wheel of economic prosperity Africa-wide. FDI, a critical component of these flows, according to Ajayi (2006) has the potential to accelerate growth and economic transformation. Although, FDI to developing countries as a whole appears to have risen over the period between 1991 and 2002, these flows have been largely uneven with Africa at the lowest rung of the ladder. For instance, Africa's share of total FDI to developing countries plummeted from about 19 per cent to a little less than 10 per cent between the 1970s and 1980s, and declined in the 1990s to an annual average of 4 per cent (UNCTAD 2003).

Figure 1: FDI and Economic Growth in Selected ECOWAS Countries, 1975-2005
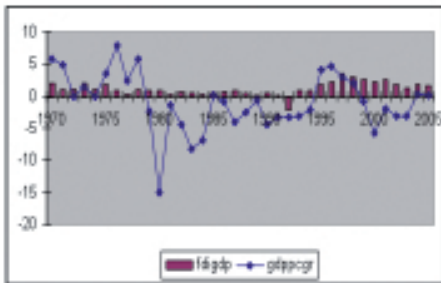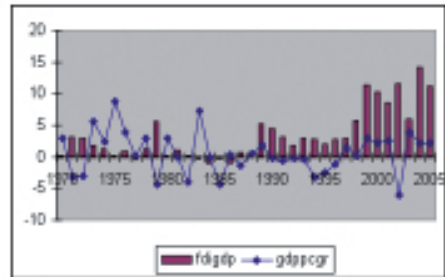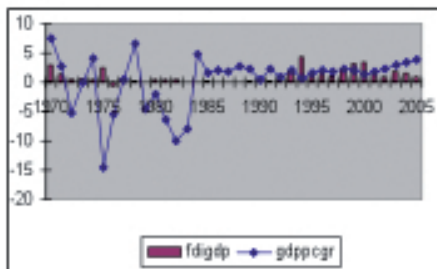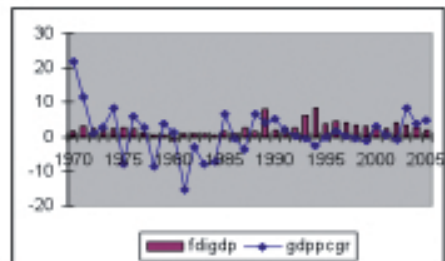
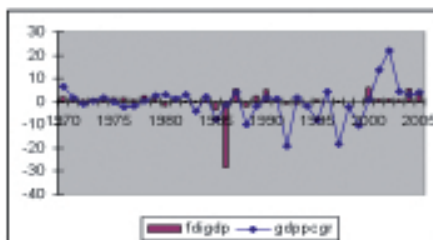This poor performance, on the basis of FDI inflow metric, however masks significant disparities not only among African countries in general but also ECOWAS countries in particular. Nigeria, chiefly due to its large oil sector, has traditionally been one of the biggest recipients of FDI inflows to Africa. Most other countries in the sub-region have however been unable to attract substantial amounts of foreign capital. *Figure 1* displays the proportion of FDI in the total output (fdigdp) of the selected countries as well as the trends in the growth of real GDP per capita (gdppcgr).

2.2 Pattern of FDI Flows in the Selected ECOWAS Countries

From *Figure 1*, higher FDI flows are closely associated with favourable growth performance in Cote'd'Ivoire. The FDI shares of 1.06% and 1.77% are accountable, in part, for the surge in economic growth from -0.13% to 3.49% in 1974 and 1975, respectively. Also, the decade of the 1980s, characterised by a drought of foreign investment flows, coincided with an era of negative growth rates in Cote'd'Ivoire. In the case of the Gambia, the picture which unfolds is somewhat different as it is difficult to concoct the same movements observed for Cote'd'Ivoire. In specific terms, although FDI flows declined steadily (albeit still positive) between 1989 and 1992, resulting in poor growth records, the subsequent increase in FDI flows over the following four years was not sufficient to reverse the negative growth trend that stood at -1.22%.

Another glimpse at the figure reveals, however, that Ghana, Nigeria and Sierra Leone each share striking similarities as well as sharp contrasts with the patterns observed in the case of Cote'd'Ivoire and Gambia. Thus, the statistics seem to unearth considerable differences among these ECOWAS countries, implying that the potential FDI possesses in fostering economic growth could differ in significant ways across these countries. There is, therefore, the need to dig a bit further into the economic peculiarities of individual countries. In respect of this, one key factor that distinguishes economies is the extent to which the financial market is developed. It is usually opined that a well functioning financial system is an important element of the absorptive capacity required in the recipient economy for FDI to spur growth.

2.3 Financial Development in ECOWAS

Reported in *Table 3* are three important indicators of financial development in the five selected ECOWAS countries. The indicators vary widely across the countries. The total domestic bank credit to GDP ratio during the 1975-84 period, ranged from 26.3 to 44.3 percent in Ghana and Gambia, respectively.

All the three financial indicators were positive for all the sampled countries and in the sub-periods presented in *Table 3*. It is also noteworthy that no clear pattern emerges with respect to the importance of financial market variables both across countries and over time in each country. While total liquid liabilities to GDP for Sierra Leone fell from 21.0 per cent in 1975-84 to 17.5 per cent in 1985-94, the same indicator declined less markedly in Nigeria from 26.9 per cent to 26.0 per cent over the same sub-periods.

Table 3: Financial Market Indicators (in % of GDP) for Some Selected ECOWAS Countries, 1975-2005[a]

Country	Domestic Credit provided by the banking sector			Liquid Liabilities			Credit to the private sector		
	1975-84	1985-94	1995-05	1975-84	1985-94	1995-05	1975-84	1985-94	1995-05
Cote'd'Ivoire	39.44	42.72	22.49	29.28	28.82	23.95	39.05	33.08	15.89
Gambia	44.34	15.00	17.17	24.74	23.30	35.66	20.51	12.69	12.58
Ghana	26.26	21.17	28.22	20.35	16.56	26.34	3.26	4.23	10.87
Nigeria	26.45	32.37	16.49	26.87	26.03	20.88	12.53	12.51	13.39
Sierra Leone	32.09	34.10	46.80	21.00	17.50	16.16	6.55	3.60	3.06

[a] Source: Author's computation from IMF's International Financial Statistics, 2007

In terms of claims exclusive to the domestic private sector, Cote'd'Ivoire appears to have the most sophisticated financial system relative to the other countries. Broadly speaking, this dominance is exhibited across measures although the total size of the financial sector seems to have declined as exhibited by the fall in the M3/GDP ratio from an average of 29.3 per cent in 1975-84 to a little above 23 per cent in 1995-2005. Sierra Leone performs worst, particularly in the 1995-05 sub-period, with the lowest private sector credit. This implies that credit constraints are relatively more binding on Sierra Leone's private sector operators. The country is, however, almost at par with Ghana with regard one of the other two measures- M3 to GDP ratio - of financial sector development.

Hence, even with similar overall financial sector size and deposit money bank credit in these countries, there are still disparities with regard overall ability of the financial sector to target the private sector with a view to stimulating investment and subsequent growth. In sum, therefore, a country by country assessment of the extent of financial sector sophistication is crucial to the understanding of how FDI, via its interaction with financial development, may exert positive influence on growth.[6] To pursue these issues further, the measurement of variables, sources of data and econometric technique used are the preoccupation of what follows.

III. A BRIEF LITERATURE REVIEW

A huge body of literature exists on the influence of FDI on economic growth. The views have evolved from the earlier capital accumulation arguments to recent support for the role of FDI in international technology transfer. This literature explores various aspects of the spillover effects of FDI such as (i) technology transfer (ii) introduction of new processes (iii) productivity gains and (iv) opening of new market opportunities (Alfaro, *et al*. 2004; Egwaikhide *et al*. 2005).[7] Apart from providing direct financing, FDI also plays a significant role in promoting growth via technology transfer and improved market access (Grossman and Helpman, 1995; Barro and Sala-I-Martin, 1997). Lensink and Morrissey (2001) discuss in considerable detail the channels

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[6] The varied attainments, of these countries, in terms of financial sector development lend credence to the appropriateness of a time series framework for this analysis. Cross sectional as well as panel approaches may obscure such influences and thus make generalisation of results incredible.

[7] Saggi (2000) contains an excellent survey on the evidence of the spillover effects of FDI.

- imitation, competition, linkages and training - through which technology transfer influences growth. Hermes and Lensink (2003) provide an explicit link among FDI, economic growth and financial sector evolution. The intuition, which appears fairly clear, is that an increase in total FDI flows results in lower fixed set-up costs as well as a rise in the rate of return on assets. This serves as an incentive for firms to make further investments. However, this outcome is to a large part determined by the efficiency with which the banking sector channels financial resources from surplus to deficit units of the economy. In this way, therefore, FDI contributes positively not only to the accumulation of capital but also the process of eventual growth via the efficient functioning of the domestic financial sector.

Although some empirical literature suggest a positive correlation between FDI and growth (see Lipsey 1999), several others posit that no such linkage exists. The results of the latter strand of evidences, in Aitken and Harrison (1999), show that the net effect of FDI on firm level productivity is negligible. They conclude that while FDI increases within-plant productivity for the recipient firm, it tends to lower that of locally-owned plants thereby casting doubt on the positive spillover effects. However, the earliest attempts, using aggregate data, at establishing a FDI-growth linkage seem to have viewed the impact of FDI on economic growth from the perspective of the market size of the recipient economy.

While a number of such studies reported a positive and statistically significant relationship (for instance, Green and Cunningham 1975, Schneider and Frey 1985, Yu 1990 among a few others), Nigh (1985) found no significant effect of FDI on the path of economic growth. Also, at the national level, Balasubramanyam, *et al*. (1996), Borensztein, *et al*. (1998) and Carkovic and Levine (2003) find that FDI effects on growth are not necessarily positive. This largely ambiguous picture suggests that the influence of FDI on growth is contingent on additional factors within the FDI-receiving economy (Durham, 2004). The initial level of development, existing stock of human capital and trade policy regime are key among the host country factors cited considered in the literature (Blomstrom *et al*. 1992, Borensztein *et al*. 1998, Balasubramanyam *et al*. 1996). Specifically, in an authoritative explanation of the importance of host country characteristics, Balasubramanyam *et al*. (1996) argued that the high technology which FDI typically embodies tended to serve as a conducive clime for the establishment of intellectual property rights. More aptly put, the more the weight attached to creating legislation backed guidelines for protecting property rights, the higher the willingness of foreign firms to follow through with high technology investments.

To further underscore the crucial role of human capital, Borensztein *et al*. (1998) point out that in addition to the aforementioned level of investments, a well-trained and adequately motivated work force is required as a complement. At the heart of their argument is the fact that the spillover effects from the adoption of new technology can only be enjoyed by domestic firms if the host economy has attained a certain threshold in terms of human capital development. Substantial research efforts have, however, been geared towards understanding the role of domestic financial markets in this setup (details in Hermes and Lensink 2003, Omran and Bolbol 2003, Alfaro *et al*. 2004, Durham 2004 and Ang 2008).[8] Also, Hermes and Lensink (2003) appear to have popularised the notion that the sophistication of the financial sector in

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8   Complementary empirical evidences, for the interested reader, can also be found in King and Levine (1993a, b); Beck *et al* (2000a, b); Levine *et al* (2000) and the references therein.

the host country is a key prerequisite for the positive effects of FDI to register on economic growth. They reckoned that the resources are more efficiently allocated within a vibrant financial system and this in some sense enhances the absorptive capacity of a FDI-receiving country. In two related, albeit independent, studies, Alfaro *et al.* (2004) and Choong *et al.* (2004) also come to the similar conclusion that lack of development of financial structures - both markets and the associated institutions - can limit an economy's preparedness to reap the benefits from potential FDI spillovers.

Based on these latter studies, financial development enhances an economy's capacity to gain from FDI in three main ways. First, host country entrepreneurs with limited access to domestic funds are able to buy new machines, adopt state-of-the-art technology and attract skilled labour owing to expanded credit availability. Second, domestic financial sector development eases the credit constraint faced by foreign firms and thus aids in the extension of innovative activities to the domestic economy. Finally, the existence of an efficient financial system facilitates FDI in creating backward linkages with the rest of the economy particularly domestic suppliers of production inputs. Thus, domestic financial system sophistication potentially plays a key role in an host economy's ability to absorb the benefits of FDI. Finance, through its interaction with FDI, then enters as an explanation for economic growth.

Therefore, while the literature amply covers the linkage between foreign direct investment and growth in both developed and developing countries, the specific strand that demonstrates a role for financial development in the FDI-growth nexus is at best rudimentary. Furthermore, most of these typically scant empirical attempts were conducted either purely for developed countries or with samples of countries that include a few from Africa. To fill this void, therefore, the present paper delves into a number of issues quite inventively. First, the FDI-growth-financial development linkage is examined with specific reference to a group of ECOWAS countries. As far as we know, empirical works on this tripartite relationship are hardly available for this regional grouping. Second, a country-by-country time-series approach is adopted implying that policy prescriptions are more likely to be based on evidences peculiar to each country. Third and not the least, we use multiple measures of financial development to reflect the variations in the policy implications relatable to these conceptually distinct indicators of financial system advancement.

IV. MEASUREMENT, DATA SOURCES AND ECONOMETRIC METHODOLOGY

This section contains the description of the measures used for economic growth, FDI and financial sector development. Also, the sources of data as well as details of the econometric approach used in the empirical analysis are outlined.

Financial deepening is conventionally viewed as the process which culminates in improvements in the quality and quantity as well as the efficiency of financial services. However, since these services are multifarious, using a single measure to capture their effect may not be informative enough. As a result, three alternative indicators of financial market sophistication with a view to ascertaining the robustness of ensuing findings are explored.

The three measures are the ratio of M3/GDP, domestic credit to the private sector as a share of GDP and total domestic credit provided by the banking sector as a percentage of GDP. These alternative measures of financial development are used in order to capture the diversity of opinions on the precise definition of financial sector development. The ratio of M3/GDP captures the total liquid liabilities of the financial system by broadly including key financial institutions such as the central bank, deposit money banks and other non-bank financial institutions (NBFIs). It is thus an encompassing measure of the overall size of the financial sector (Alfaro *et al.* 2004). The second indicator, domestic credit to the private sector, distinguishes between the end users of the claims of financial intermediaries. It includes only the claims on the private sector. Total banking sector credit as a percentage of GDP, the third measure, excludes non-bank credit to the private sector and may be less comprehensive than the second measure (claims on the private sector as a ratio of GDP). In keeping with the standard practice the study uses the growth of real GDP per capita as a proxy for economic growth while, the share of FDI in GDP is the measure of FDI flows.

The data were transformed to natural logarithms for the conventional statistical reasons. All data were collected from the World Bank's *World Development Indicators*, 2007 and the IMF's *International Financial Statistics Yearbook*, 2007. Appendix *Table A* summarises the definition and sources of the data used.

In terms of econometric methodology, the cointegration approach offers useful insights towards testing for causal relationships. In principle, two or more variables are adjudged to be cointegrated when they share a common trend. Hence, the existence of cointegration implies that causality runs in at least one direction (Granger 1988)[9]. Theoretically, we consider the following VAR of order P:[10]

$$Y_t = \mu + A_1 Y_{t-1} + ... + A_{p-1} Y_{t-p} + \varepsilon_t \tag{1}$$

where Y_t is a 3 X 1 vector of I (1) variables namely GDP per capita growth, FDI and our measures of financial development (FD). If these variables share a common long-run trend, it follows from Granger's representation theorem that the VAR model can be expressed in VECM specification as:

$$\Delta Y_t = \mu + \Gamma_1 \Delta Y_{t-1} + ... + \Gamma_{p-1} \Delta_{t-p+1} + \Pi Y_{t-1} + \varepsilon_t \tag{2}$$

where Δ is the difference operator, and ε_t is a vector of independently and identically distributed disturbance terms. If the rank of Π lies discretely between 1 and 3, then a decomposition into $\Pi = \alpha\beta$ is possible. Equation (2) can then be re-written as:

$$\Delta Y_t = \mu + \Gamma_1 \Delta Y_{t-1} + ... + \Gamma_{p-1} \Delta_{t-p+1} + \alpha(\beta' Y_{t-1}) + \varepsilon_t \tag{3}$$

where the rows of β are unique cointegrating vectors and the α's are indicative of the extent of adjustment towards equilibrium. The explicit form of equation (3) is presented in the

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[9] Causality notwithstanding, however, cointegration fails with respect to providing an indication of the direction of causality between variables, a task which the vector error correction model (VECM) accomplishes with amazing dispatch.

[10] The rest of what follows, with regard econometric approach, draws substantially from Abu-Bader and Abu-Qarn (2008).

trivariate VAR model below:

$$\Delta Y_{1t} = \mu_1 + \sum_{h=1}^{r} \alpha_{1,h} ECT_{h,t-1} + \sum_{k=1}^{p-1} \beta_{11,k} \Delta Y_{1,t-k} + \sum_{k=1}^{p-1} \beta_{12,k} \Delta Y_{2,t-k} + \sum_{k=1}^{p-1} \beta_{13,k} \Delta Y_{3,t-k} + \varepsilon_{1t} \quad (4)$$

$$\Delta Y_{2t} = \mu_2 + \sum_{h=1}^{r} \alpha_{2,h} ECT_{h,t-1} + \sum_{k=1}^{p-1} \beta_{21,k} \Delta Y_{1,t-k} + \sum_{k=1}^{p-1} \beta_{22,k} \Delta Y_{2,t-k} + \sum_{k=1}^{p-1} \beta_{23,k} \Delta Y_{3,t-k} + \varepsilon_{2t} \quad (5)$$

$$\Delta Y_{3t} = \mu_3 + \sum_{h=1}^{r} \alpha_{3,h} ECT_{h,t-1} + \sum_{k=1}^{p-1} \beta_{31,k} \Delta Y_{1,t-k} + \sum_{k=1}^{p-1} \beta_{32,k} \Delta Y_{2,t-k} + \sum_{k=1}^{p-1} \beta_{33,k} \Delta Y_{3,t-k} + \varepsilon_{3t} \quad (6)$$

where $ECT_{h,t-1}$ is the h th error correction term which is the one period lag of the residuals from the h th cointegration equation. $\beta_{ij,k}$ reflects the effect of the k th lag of variable j on the current value of variable $i : \forall i, j = $ FDI, GDP, FD.

It is pertinent to note that in addition to providing indication on the direction of causation, the VECM also enables the identification of short- and long-run causality. In the system of equations presented in equations (4) to (6), long-run causality in the cointegration framework is considered using a t-test on the null hypothesis:

$$H_0 : \alpha_{j,h} = 0 \, for \, h = 1,...,r \quad (7)$$

while causality over the short-run horizon is examined by conducting a similar F-test on:

$$H_0 : \beta_{ij,1} = ... \beta_{ij,p-1} = 0 \quad (8)$$

A rejection of either one or both of these hypotheses lends credence to the conclusion of causality, in the Granger sense, between the variables under scrutiny.

V. EMPIRICAL FINDINGS AND DISCUSSION

This section is preoccupied with the presentation and attendant discussion of the results of the unit root and cointegration tests conducted. It further explicates the intuition underlying the findings emerging from the estimated error correction models.

5.1 Stationarity Tests

Cointegration is typically in the offing when each variable is integrated of the same order $d \geq 1$. This necessary, but rarely sufficient, condition implies that the series share a common trend. Hence, as a preliminary step, we ascertain whether mean reversion is characteristic of each variable using ADF test (Dickey and Fuller, 1979). This is conducted, with intercept only and intercept and trend respectively, on the levels and first difference of the series. We find that all the variables are stationary on differencing once.[11] This finding of I(1) is consistent across the countries.

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[11]   The results, not reported for the sake of brevity, obtained using the Phillips-Perron as well as DF-GLS unit root tests are similar to the Augmented Dickey Fuller statistics.

5.2 Analysis of Cointegration

The next step is to formally test for cointegration among the relevant variables. Here, we adopt Johansen's maximum likelihood based approach. Using an optimal lag structure in the unrestricted VAR, the findings show that; (i) the existence of a long-run association between FDI and economic growth is supported for Sierra Leone only; and (ii) unique cointegration relationships are found in more countries when specific measures of financial development are used as intervening variables. For instance, with total banking credit, cointegration was supported for Nigeria, while in both Ghana and Sierra Leone, FDI, economic growth and credit to the private sector share a common long-term trend. Also, in terms of overall financial sector size (M3-to-GDP), cointegration was found for the Gambia and Ghana. In sum, support is garnered for cointegration in at least one country irrespective of the measure of financial sector development used (The results of the unit root and cointegration tests are reported in Appendix B and C, respectively).

5.3 Vector Error Correction Model Findings

Sequel to the acceptance of cointegration in the preceding section, the analysis proceeds with the estimation of a vector error correction model. The results, which are presented in *Tables 4*, *5* and *6*, are indicative of the tri-variate causal relationship among foreign direct investment, economic growth and financial indicators in some[12] of the selected countries. Specifically, the findings reported in *Table 4* tend to support the non-existence of a causal flow from either foreign direct investment or financial development - proxied by total banking sector credit (lbk) - to economic growth in Nigeria. A closer peep reveals statistically insignificant coefficients on both the lagged FDI and banking sector credit. Also, the error correction term – albeit with the a priori sign – as well as the F-statistic in the economic growth equation point to a rejection of causality from both variables to economic growth[13]. It is hardly evident that foreign direct investment and economic growth are causally linked even in the presence of financial sector development. Rather, the results are suggestive of improvements in the total credit of the financial system when efforts at attracting FDI are successful. The foregoing rejection of causality from both variables to economic growth is in sharp contrast to the conclusions drawn in the studies by Choong et.al (2004) and Hermes and Lensink (2004), for both of these papers found the evolution of the financial sector significant in explaining economic growth via the channelling of the spillover effects from foreign direct investment. A plausible reason in the specific case of Nigeria could be the resource-seeking nature of FDI flows. The bulk of investment of this class are targeted at the oil and gas sector which has been typically characterised by acute weaknesses in terms of both forward and backward linkages

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[12] It is pertinent to note, here, that only countries where a long-run association among the variables of interest was found are referred to. The overall picture is that there is cointegration when at least one measure of financial sector development is used for Gambia, Ghana, Nigeria and Sierra Leone. On the flip side, however, these variables were not cointegrated regardless of the financial indicator employed for Cote'd'Ivoire.

[13] However, there is a causal flow running from FDI to financial development which is authenticated by the error correction term and the lagged (first) FDI in the equation with financial depth as dependent variable. The statistical significance is, however, weak as only at the 10 per cent level is a rejection of causality not possible.

with the rest of the economy. Thus, reform measures aimed at fostering economic prosperity in Nigeria should focus primarily on creating the required linkages, while viewing financial system overhauling merely as a complementary part of the overall reform agenda.

Table 4: Error-Correction Model/ Causality Test Between Δlinc, Δfdi and Δlbk (Nigeria)

Variables in equation	Dependent variables		
	Δlinc	Δfdi	Δlbk
Constant	-0.0011(-0.1069)	0.1313(0.3370)	-0.0183(-0.3405)
Δlinc(-1)	-0.0192(-0.7133)	0.1530(0.2548)	0.1231(-0.1058)
Δlinc(-2)	0.0412(0.2090)	-0.2791(-0.7241)	-0.8013(-0.7982)
Δfdi(-1)	0.0071(1.0696)	0.5358(-2.1961)**	0.0625(1.8592)***
Δfdi(-2)	0.0066(0.9698)	-0.3154(-1.2536)	-0.0195(-0.5623)
Δlbk(-1)	-0.0534(-1.3724)	0.7036(1.1827)	0.4056(2.0450)**
Δlbk(-2)	0.0122(0.3358)	-0.7821(-1.3263)	-0.1785(-0.9648)
ECMt−1	-0.0767(-0.7133)	0.6768(0.4244)	-0.0231(-1.8809)***
F-statistic	0.6157 (0.4631)	1.3509(0.2144)	1.6798(0.3347)
R^2	0.17	0.31	0.38
Log likelihood	47.3660	57.3447	0.1559
Akaike AIC	-2.7149	4.5065	0.5409
Schwarz SC	-2.3377	4.8837	0.9181

Notes: linc, fdi and lbk represent growth, foreign direct investment and banking credit to the private sector respectively. Δ is the difference operator. *,** and *** stand for statistical significance at the 1%, 5% and 10% levels in that order. The t-values are in parenthesis while the F-statistics are accompanied by their corresponding probability values. The maximum lag length of 2, employed in all estimations, was chosen on the basis of the conventional key information criteria.

The indicator of the overall size of the domestic banking sector (lm3) is the intervening variable between foreign direct investment and economic growth in *Table 5*. A cursory glance at the table shows there is clear-cut evidence of a causal association between foreign direct investment and economic growth. While, in the Gambian case, both the lagged terms of the direct investment were statistically significant at most at the five per cent level, only the second period lag of this variable was significantly different from zero for Ghana.

In terms of magnitude, the coefficients on the lagged FDI terms are similar for both of these countries although the signs are opposite. Both countries also display appreciable speed with respect to convergence to the long-run equilibrium following any perturbation. Precisely, about 34 and 36 per cent of adjustments towards the steady state are made within a year in Ghana and the Gambia, respectively. Conversely, for both the FDI and financial development equations, no causality was detected for the countries, except a marginally significant (at 10 per cent) first lag of economic growth in Ghana's FDI equation[14]. Therefore, in alignment

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[14]   The error correction terms all appear with the wrong signs save the FDI equation for Gambia. The coefficient, insignificant from a statistical standpoint, of -0.1903 implies about one-fifths of adjustments to the long-run are made in 1 year.

Table 5: Error-Correction Model/Causality Test Between Δlinc, Δfdi and Δlm3
(Gambia and Ghana)

Variables in equation	Dependent variables (Gambia)			Dependent variables (Ghana)		
	Δlinc	Δfdi	Δlm3	Δlinc	Δfdi	Δlm3
Constant	0.0061(1.2177)	0.4493(0.9018)	0.0295(1.1025)	-0.0005(-0.0699)	-0.0093(-0.0522)	0.0087(0.3483)
Δlinc(-1)	-0.0080(-0.0561)	0.4865(1.6603)	-0.3759(-0.4949)	0.3706(2.5319)**	0.7095(1.9438)***	0.6921(1.2417)
Δlinc(-2)	0.1043(0.6752)	-0.4646(-1.4692)	-0.6687(-0.8145)	-0.0051(-0.0306)	-0.2181(-1.1536)	0.2035(0.3201)
Δfdi(-1)	0.0056(2.6703)**	-0.3338(-1.6080)	0.0011(0.0978)	-0.0097(-1.3601)	-0.1989(-1.0245)	0.0196(0.7184)
Δfdi(-2)	0.0067(3.0367)*	-0.0731(-0.3332)	0.0124(1.0556)	-0.0164(-2.5730)**	0.0944(-0.5455)	0.0019(0.0773)
Δlm3(-1)	-0.0773(-1.8909)***	-0.8524(-0.7045)	-0.3041(-1.3985)	0.0054(0.1039)	0.1713(0.1218)	-0.0888(-0.4495)
Δlm3(-2)	-0.00083(-0.2203)	-0.2215(-0.3263)	0.0611(0.3038)	0.1111(2.2857)**	0.4599(1.1084)	0.0087(0.3483)
ECM_{t-1}	-0.3604(-4.0823)*	-0.1903(-0.2506)	0.1723(0.3671)	-0.3429(-3.3699)*	0.7931(1.3758)	0.3061(0.7901)
F-statistic	3.5576(0.1153)	1.9422(0.7433)	1.0971(0.3189)	3.7790(0.1015)	1.8449(0.1875)	0.5729(0.0709)
R^2	0.50	0.35	0.24	0.51	0.34	0.14
Log likelihood	78.3033	-73.3399	23.1657	66.6798	-42.2015	22.5551
Akaike AIC	-4.2608	4.9296	-0.9191	-3.5564	3.0425	-0.8821
Schwarz SC	-3.8980	5.2924	-0.5563	-3.1936	3.4053	-0.5193

Notes: linc, fdi and lm3 represent growth, foreign direct investment and total liquid liabilities of the banking sector in that order. Δ is the difference operator. *, ** and *** stand for statistical significance at the 1%, 5% and 10% levels in that order. The t-values are in parenthesis while the F-statistics are accompanied by their corresponding probability values. The maximum lag length of 2, employed in all estimations, was chosen on the basis of the conventional key information criteria.

Table 6: Error-Correction Model/ Causality Test Between Δlinc, Δfdi and Δlpv
(Ghana and Sierra Leone)

Variables in equation	Dependent variables (Ghana)			Dependent variables (Sierra Leone)		
	Δlinc	Δfdi	Δlpv	Δlinc	Δfdi	Δlpv
Constant	0.0011(0.2166)	0.0086(0.0496)	0.0204(0.5025)	-0.0048(-0.3299)	0.2566(0.3280)	0.0042(0.1119)
Δlinc(-1)	0.2394(1.9340)***	0.1193(2.2573)**	0.8810(0.9524)	0.0655(0.3166)	0.8805(0.7042)	0.7597(1.4000)
Δlinc(-2)	-0.1212(-0.9240)	-0.1995(-0.9809)	-0.5113(-0.5066)	0.1167(0.5752)	-0.9215(-0.5394)	1.1367(2.1352)**
Δfdi(-1)	-0.0054(-0.9712)	-0.2962(-1.6401)	0.0227(0.5344)	-0.0003(0.0722)	0.3207(1.3554)	0.0096(0.8411)
Δfdi(-2)	0.0119(-2.3622)**	-0.1502(-0.9173)	0.0154(0.3985)	0.0013(0.4187)	0.3725(2.2548)**	0.0069(0.8635)
Δlpv(-1)	0.0974(-3.0459)*	1.6835(1.6126)	-0.1537(-0.6245)	0.0683(0.8953)	0.2200(1.7481)	-0.2456(-1.2263)
Δlpv(-2)	-0.0054(-0.1714)	0.6024(0.5796)	-0.5717(-2.3335)**	0.0631(0.7835)	0.7816(2.9337)**	-0.3510(-1.6612)
ECM_{t-1}	-0.5007(-4.4220)*	0.7796(1.5640)	-0.8276(-2.0979)**	-0.0110(-0.1776)	-0.2186(-4.8358)*	0.0709(0.4357)
F-statistic	7.3489(0.0876)	1.9756(0.0636)	1.4935(0.2817)	0.5302(0.4371)	11.2144(0.6533)	2.8287(0.0919)
R^2	0.67	0.36	0.29	0.12	0.75	0.44
Log likelihood	73.2117	-41.8082	5.8765	40.3340	-91.3666	8.5039
Akaike AIC	-3.9522	3.0187	0.1287	-1.9596	6.0222	-0.0305
Schwarz SC	-3.5894	3.3815	0.4915	-1.5968	6.3850	0.3322

Notes: linc, fdi and lpv denote growth, foreign direct investment and credit to the private sector respectively. Δ is the difference operator. *, ** and *** stand for statistical significance at the 1%, 5% and 10% levels in that order. The t-values are in parenthesis while the F-statistics are accompanied by their corresponding probability values. The maximum lag length of 2, employed in all estimations, was chosen on the basis of the conventional key information criteria.

with the submissions of Alfaro *et al*. (2004) and Durham (2004), for Ghana and the Gambia well developed financial markets - particularly in terms of the overall size - promote economic performance by absorbing the benefits embodied in FDI flows. A major implication is that these countries need to continue with the emphasis on financial sector reforms as an integral part of their overall economic restructuring.

With a view to more precisely capturing the efficiency of the domestic financial institutions in channelling funds to the private sector, financial development is also proxied by the percentage of domestic private sector credit in GDP (lpv)[15]. *Table 6* contains the results on the FDI-Growth nexus using the third financial indicator. Most striking is the lack of support for causality flowing, in the short-run, from either financial development or foreign direct investment to economic growth in Sierra Leone.

Also, from a long-term perspective, it is difficult to argue for an association as the error correction term is insignificant with a hardly credible indication as regard speed of adjustment. Only about 1.0 per cent of the deviation from equilibrium is corrected per year! The contrariety is, however, obvious for Ghana. In the short-run, both the private sector credit and FDI are causally linked with economic growth. In a similar fashion, the long-run comovement of these variables is evident from the statistical significance of the error correction term in the growth equation[16]. About half of the adjustment to the equilibrium state is achieved annually. Thus , directing more financial resources to the domestic private sector might not yield the desired growth outcome in Sierra Leone. This might be, in large part, due to the relatively smaller size of the economy together with the attendant miniature participation of private enterprises in the determination of the trajectory of economic growth. In Ghana, however, the potential for financial development to absorb the growth enhancing benefits embedded in FDI flows is far from trivial. Attempts at making the financial sector more responsive to the financing needs of the private sector will aid the latter in extending technological innovations to other sectors of the economy. This will in turn lead to an overall improvement in productivity across sectors and ultimately higher growth trajectory for the economy.

VI. CONCLUSION

This empirical enquiry employed the VEC model to examine the foreign direct investment-financial development-growth nexus for a sample of five ECOWAS economies. Foreign direct investment has been argued to have positive spillover effects on the performance, as measured here by economic growth, of recipient economies. These benefits are however dependent on the

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[15] The view that the private sector more efficiently makes investment decisions vis-à-vis the public sector has a long history in economics. The intuition remains that devoting higher proportions of available resources to the public sector has as upshot the crowding out of private investment. The channel of transmission, of course, working particularly via increases in the interest rate at equilibrium.

[16] Although the emphasis, in this study, in principle is on providing explanation for economic growth, a few interesting results are also discernible from Table 6. For instance, economic growth is significant in explaining FDI flows in the short-run in Ghana even though no causal linkage exists over the longer horizon. In Sierra Leone, it is domestic private sector credit that Granger causes FDI in the short-run. The error correction term is also statistically important. Also, while there is evidence for long-run causality running from FDI and economic growth to private sector credit in Ghana, it is difficult to ferret out such relationship in the case of Sierra Leone.

existence of certain preconditions in the domestic economy. Market size, human capital, trade orientation, legal framework are chief among other prerequisites that the earlier literature on the subject matter have made recourse to. The role of domestic financial system development has been accentuated, however, in more recent empirical enquiries. Therefore, the principal aim of study was to examine the causal relationship between foreign direct investment and economic growth with financial deepening as an intervening factor in some selected countries. We probed this issue differently in at least three ways. First, we innovate by considering this tripartite association with an entirely ECOWAS sample. Second, we attempt policy prescriptions on a country-by-country basis to enable gravitation towards more useful interventions by policymakers in these economies. Finally, robustness is ascertained through the use of an array of financial development indicators with obvious policy implications.

We employ annual time series data - on economic growth, foreign direct investment as well as three alternative measures of financial system refinement - over the period spanning 1970 to 2005 within a vector error correction framework. The results revealed lack of support for both short- and long-run influence of FDI flows on economic growth in the presence of credit to the domestic private sector (our financial indicator) in the Sierra Leonean economy. Contrariwise, in Ghana, growth and foreign investment flows are better linked by a supportive domestic private sector engendered by sound intermediating financial institutions. The overall size of the financial sector - proxied by total liquid liabilities (lm3) - matters for the FDI-growth interaction in both Ghana and Gambia (Although the speed of adjustment towards equilibrium is marginally slower in the former). At length, FDI flows in Nigeria appear to be resource-seeking and hence possess minimal growth effects regardless of the level of financial development. There are some broad implications arising from these findings. The most important of which is that attempts by these countries to adopt uniform policy agenda could be counterproductive. Since we find all indicators of financial deepening important as intervening variables in at least one country[17], the relevant components of the financial structure should be strengthened in individual countries. To sum up, policy prescriptions should be embarked upon on a case-by-case basis since there are reasons to accept as true the notion of considerable heterogeneity in the underlying economic structures of these countries. A few extensions seem interesting avenues for future research. The introduction of thresholds into the modelling exercise could prove a seemingly daunting but ultimately rewarding activity. Also, since the estimation approach used is ineffectual in terms of gauging the strength of causality out-of-sample, innovation accounting techniques particularly forecast error variance decomposition (VDC's) could be more suitably adopted. Finally, the incorporation of breaks in both individual series and the cointegrating vectors may be an interesting pursuit.

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[17]   The exception, of course, being Cote'd'Ivoire where the non-existence of a cointegration relationship precluded the analysis of both long-run comovements and short-run dynamics among the variables included in the study.

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APPENDIX A: DATA DEFINITION AND SOURCES

Variables	Definition	Source
Credit to the Private Sector (lpv)	The value of credits by financial intermediaries to the private sector divided by GDP. This excludes credit to the public sector as well as cross claims of one group of intermediaries on another	International Financial Statistics
Total Liquid Liabilities (lm3)	Currency plus demand and interest bearing liabilities of financial intermediaries and non-bank financial institutions divided by GDP	International Financial Statistics
Total Banking Sector Credit to the Private Sector (lbk)	Credit by deposit money banks to the private sector as a ratio of GDP	International Financial Statistics
Growth (linc)	Output Level and/or growth as measured by the real per capita GDP, constant dollars	World Development Indicators
Foreign Direct Investment (fdi)	The net inflow of investment to acquire a lasting management interest (10% or more of voting stock) in an enterprise operating in the recipient economy. It is the sum of equity capital, reinvestment of earnings, other long-term capital and short-term capital	International Financial Statistics

APPENDIX B: AUGMENTED DICKEY-FULLER UNIT ROOT TEST RESULTS FOR THE SELECTED COUNTRIES

Cote d Ivoire

Variable	Levels		First Difference		Decision
	Drift	Drift & Trend	Drift	Drift & Trend	
linc	-0.2268	-1.9045	-3.8313*	-3.7331**	I (1)
fdi	-2.6915	-3.0219	-8.1563*	-8.0324*	I (1)
lbk	-0.7512	-1.0345	-4.0577*	-5.0802*	I (1)
lpv	0.1355	-2.5621	-4.6068*	-5.1033*	I (1)
lm3	-2.1111	-3.1912	-7.2451*	-7.1833*	I (1)

Gambia

Variable	Levels		First Difference		Decision
	Drift	Drift & Trend	Drift	Drift & Trend	
linc	-2.0072	-1.9926	-5.9100*	-5.9108*	I (1)
fdi	-0.2274	-3.0076	-9.3107*	-5.9278*	I (1)
lbk	-1.9761	-2.1733	-3.9290*	-3.8845**	I (1)
lpv	-1.8300	-2.0288	-6.3933*	-6.2906*	I (1)
lm3	-1.2994	-2.1142	-8.4283*	-8.3396*	I (1)

Ghana

Variable	Levels		First Difference		Decision
	Drift	Drift & Trend	Drift	Drift & Trend	
linc	-1.2883	3.8522**	-4.9472*	-5.1999*	I (1)
fdi	-1.6489	-1.8523	-3.5154**	-4.2835*	I (1)
lbk	-2.0014	-1.9476	-5.9831*	-5.9678*	I (1)
lpv	-0.6377	-1.5217	-4.9862*	-5.7874*	I (1)
lm3	-1.1449	-1.3415	-6.0244*	-5.9983*	I (1)

Nigeria

Variable	Levels		First Difference		Decision
	Drift	Drift & Trend	Drift	Drift & Trend	
linc	-1.6771	-1.8508	-4.4742*	-4.4756*	I (1)
fdi	-1.8321	-2.0015	-3.4391**	-3.6869**	I (1)
lbk	-2.6575	-2.0572	-3.8801*	-4.4054*	I (1)
lpv	-2.1447	-1.9712	-6.3035*	-6.3359*	I (1)
lm3	-2.6823	-2.3291	-4.1040*	-4.4090*	I (1)

Sierra Leone

Variable	Levels		First Difference		Decision
	Drift	Drift & Trend	Drift	Drift & Trend	
linc	-1.0531	-1.3306	-5.0243*	-4.9707*	I (1)
fdi	-2.1406	-2.3218	-5.7218*	-5.6999*	I (1)
lbk	-2.8052	-2.7214	-6.3626*	-6.4238*	I (1)
lpv	-1.8440	-2.5241	-7.4266*	-7.3675*	I (1)
lm3	-1.8395	-1.8596	-6.26598	-6.1588*	I (1)

Notes: In a tables above *, ** indicate significance at the 1% and 5% levels respectively. The critical values for all models are as follows; (i) Levels - drift and drift and trend - are -3.6329, -2.9484, -2.6129 and -4.2436, -3.5443, -3.2047 at the 1%, 5% and 10% levels of significance in that order. (ii) First Differences - drift and drift and trend - are -3.6394, -2.9511, -2.6143 and -4.2529, -3.5485, -3.2071 at the respective significance levels.

APPENDIX C: JOHANSEN COINTEGRATION TEST RESULTS

Table C1: Foreign Direct Investment and Economic Growth

Countries	$H_0 : rank = p$	λ_{Max}	λ_{Trace}
Cote'd'Ivoire	$p = 0$ $p < =1$	6.721 0.916	7.637 0.915
Gambia	$p = 0$ $p < =1$	7.412 0.097	7.509 0.097
Ghana	$p = 0$ $p < =1$	9.515 3.573	13.089 3.573
Nigeria	$p = 0$ $p < =1$	8.487 3.111	11.598 3.111
Sierra Leone	$p = 0$ $p < =1$	16.295* 1.754	14.541* 1.754

Notes: The critical values for the maximum eigenvalue statistics (λ_{Max}) and the trace statistics (λ_{Trace}) are 14.327 and 3.841 as well as 14.265 and 3.841 at rank $p < 0$ and $p = 0$ respectively. *, ** represent significance at the 5% and 1% levels.

Table C2: Foreign Direct Investment, Economic Growth and Domestic Credit Provided by the Banking Sector

Countries	$H_0 : rank = p$	λ_{Max}	95% c.v	λ_{Trace}	95% c.v
Cote'd'Ivoire	$p = 0$ $p < =1$ $p < =2$	13.613 7.862 1.335	21.132 14.265 3.841	22.810 9.197 1.335	29.797 15.495 3.841
Gambia	$p = 0$ $p < =1$ $p < =2$	16.839 4.936 0.197	21.131 14.265 3.841	21.972 15.133 0.197	29.797 15.495 3.841
Ghana	$p = 0$ $p < =1$ $p < =2$	16.297 7.537 3.036	21.131 14.265 3.841	26.871 10.573 3.036	29.797 15.495 3.841
Ghana	$p = 0$ $p < =1$ $p < =2$	18.081 8.164 3.186	21.131 14.265 3.841	31.431* 13.350 3.186	29.797 15.495 3.841
Sierra Leone	$p = 0$ $p < =1$ $p < =2$	17.564 8.176 1.812	21.131 14.265 3.841	27.552 9.988 1.812	29.797 15.495 3.841

Notes: *, ** indicate statistical significance at the 5% and 1% levels respectively. c.v is used here as an acronym for critical values against which the computed values are juxtaposed.

Table C3: Foreign Direct Investment, Economic Growth and
Credit to the Private Sector

Countries	$H_0 : rank = p$	λ_{Max}	95% c.v	λ_{Trace}	95% c.v
Cote'd'Ivoire	$p = 0$	16.086	21.132	24.299	29.797
	$p < =1$	7.513	14.265	8.213	15.495
	$p < =2$	0.701	3.841	0.701	3.841
Gambia	$p = 0$	9.472	21.132	13.331	29.797
	$p < =1$	3.562	14.265	3.859	15.495
	$p < =2$	0.297	3.841	0.297	3.841
Ghana	$p = 0$	33.106**	21.132	49.557**	29.797
	$p < =1$	11.485	14.265	16.452*	15.495
	$p < =2$	2.966	3.841	4.966*	3.841
Ghana	$p = 0$	9.426	21.132	19.597	29.797
	$p < =1$	8.020	14.265	10.171	15.495
	$p < =2$	2.151	3.841	2.151	3.841
Sierra Leone	$p = 0$	23.266	21.132	32.275*	29.797
	$p < =1$	6.777	14.265	9.009	15.495
	$p < =2$	2.232	3.841	2.232	3.841

Note: Same as in *Table C2* above.

Table C4: Foreign Direct Investment, Economic Growth and
Total Liquid Liabilities

Countries	$H_0 : rank = p$	λ_{Max}	95% c.v	λ_{Trace}	95% c.v
Cote'd'Ivoire	$p = 0$	17.364	21.132	23.758	29.797
	$p < =1$	5.624	14.265	6.394	15.495
	$p < =2$	0.770	3.841	0.769	3.841
Gambia	$p = 0$	20.629	21.132	31.388*	29.797
	$p < =1$	10.753	14.265	10.759	15.495
	$p < =2$	0.006	3.841	0.006	3.841
Ghana	$p = 0$	22.143*	21.132	32.440*	29.797
	$p < =1$	9.088	14.265	10.297	15.495
	$p < =2$	1.209	3.841	1.209	3.841
Ghana	$p = 0$	17.273	21.132	27.435	29.797
	$p < =1$	7.191	14.265	10.161	15.495
	$p < =2$	2.971	3.841	2.971	3.841
Sierra Leone	$p = 0$	18.456	21.132	27.264	29.797
	$p < =1$	6.052	14.265	8.807	15.495
	$p < =2$	2.755	3.841	2.755	3.841

Note: Same as in *Table C2* above.