JOURNAL OF ECONOMIC DEVELOPMENT
Volume 40, Number 3, September 2015

FOREIGN CAPITAL FLOWS, FINANCIAL DEVELOPMENT AND GROWTH IN SUB-SAHARAN AFRICA

OLUWATOSIN ADENIYI[a] , BELLO AJIDE[b], AND AFEES SALISU[c*]

[a]*University of Ibadan, Nigeria*
[b]*University of Lagos, Nigeria*
[c]*Federal University Abeokuta, Nigeria*

This paper investigated how financial development influences the relationship between foreign direct investment (FDI) and economic growth in selected Sub-Saharan Africa (SSA) countries. This study considered three alternative measures of financial development (FD) and their impacts on the FDI-growth linkage. It also explored the possibility of non-linearities in the tripartite relationships. The results showed a positive influence of FDI on economic growth. Financial system development also had growth-promoting impact in the presence of FDI flows. Interestingly, these findings remained robust when potential endogeneity was accounted for using a well known instrumental variable (IV) estimator. Digging deeper, the findings also supported the existence of non-linearities in the role of FD in the FDI-growth association. In policy terms, these SSA countries will reap more growth benefits from foreign capital flows especially if financial reforms are sustained.

Keywords: Financial Development, Foreign Direct Investment, Gross Domestic Product, Sub-Saharan Africa
JEL classification: E44, G20, O16

1. INTRODUCTION

Orthodox development perspective quite apparently delineates an important role for capital flows from richer countries as a critical component of the much-needed development finance requirement in the developing world. This North-South capital kinesis paradigm, while encompassing diverse categories of capital - portfolio investment, remittances, foreign direct investment (FDI), and official development assistance (ODA) among others - recognises the prominence of foreign direct investment,

[*] We would like to thank the anonymous referee for valuable comments. All remaining errors are our own.

relative to other sources, as a key predictor of economic growth. In 2004, for example, FDI accounted for one half of total resource flows to developing countries, while remittances, ODA and portfolio equity split, albeit not equiproportionally, the remaining half (World Bank, 2011). This seems particularly apposite since foreign direct investment both in its conception and composition examplifies the necessary long term ingredients required to nurture growth which in itself is a phenomenon observable chiefly over comparably long horizons.

However, there are conflicting opinions not only on the importance of foreign direct investment (FDI) on economic growth but also on the channels. FDI can positively affect growth by an outward shift in the economy's production possibilities frontier through technology transfer and the attendant spillovers (Blomstrom *et al*, 1994; Kokko and Blomstrom, 1995). The former underscores the importance of all categories of investment, particularly FDI, in maintaining the economy on a sustainable growth trajectory. For instance, most sub-Saharan Africa (SSA) countries witnessed systematic declines in investment rates from the early 1980s with corresponding negative growth rates in real output till around 1990 in some cases (Oshikoya, 1994). Therefore, since FDI flows to these countries ranked amongst the lowest to developing countries, it suggests close ties between low investment and the observed economic downturn in SSA during this decade that has been tagged "lost".

While the positive influence of FDI on growth remains in large part an empirical regularity, a crucial issue that is by far less clear regards the channels through which the positive impact of FDI on economic growth works (Lemi and Asefa, 2003). A prominent view that has emerged in this discourse is that the absorptive capacity of the FDI-receiving country matters. Interestingly though, this absorptive capacity has been looked at under different prisms. For instance, Balasubramanyam *et al*, (1996) and Borensztein *et al*, (1998) see the domestic economy's trade as well as human capital policies as the prerequisite for FDI's growth-promoting effects, while De Mello (1997) focused on the importance of physical capital accumulation. Likewise, there are equally a number of other somewhat complimentary opinions along the lines of market size, natural resource endowment amid a host of other factors.

In more recent studies, however, research focus appears to have shifted to the role of the recipient economy's financial sector in the FDI-Growth nexus (see Hermes and Lensink, 2003; Alfaro *et al*, 2004 for elaborate narratives). There are at least three distinct merits to emphasize this shift. First, deeper and broader based financial institutions through more efficient delivery of financial services serve to promote growth directly (Levine, 1997; Errunza, 2001). Second, advanced financial systems by construction are better positioned to attract foreign direct investment which is a vital predictor of growth (Albuquerque, 2003). Third, increased financial sector efficiency should lower transaction costs which are chiefly related to perceived risks arising from information asymmetries (Reisen and Soto, 2001).

While this study is similar in spirit to this latter strand of evidences, we tread a distinct path on a number of fronts. First, the link between FDI and economic growth

and the influence of financial development is delved into within a SSA-specific panel context. This, as far as we are aware, is a pioneer attempt in this direction. It is, however, not out of order to grant that Adeniyi *et al*, (2012) also examined this relationship using a sample of West African countries, although their study was time-series-focused and they deployed a far less extended sample relative to this study. Second, three alternative measures of financial development (FD) which capture various aspects of the level of advancement in the domestic financial sector are employed. This is to provide an avenue for assessing the sensitivity of the FDI-growth association to changes in the definition of FD as well as the policy implications arising from such compartmentalized treatment of the financial sector. Third, the ongoing global financial crisis appears to have brought in tighter borrowing constraints for SSA economies. Hence, well-functioning financial systems which offer better intermediation by efficiently channelling investments into productive ventures within these local economies could prove useful in dampening the adverse effects of the inevitable reductions in the flow of foreign funds especially official development assistance. Fourth, but not less important, the possibility of the existence of non-linearities is queried precisely through the polynomial interaction of the financial system development with foreign direct investment.

Therefore, this paper specifically investigates how financial sector development influences the FDI-growth relationship using a sample of 11 SSA countries over the period 1970-2005.[1] More precisely, it attempts to investigate whether domestic financial development in the selected SSA countries sufficiently captures the absorptive capacity requisite for harnessing the potential growth spurring effects of foreign direct investment flows. The rest of the paper is structured as follows. Section 2 contains a succinct review of the literature on the FDI-FD-growth linkage. Section 3 attempts a portrayal of the extent of financial system advancement in the selected SSA countries, while section 4 describes the empirical model and dataset. The results are presented and discussed in section 5. The sixth and final section succinctly concludes.

2. BRIEF LITERATURE REVIEW

Although the broader literature on FDI and growth is substantial in both its spread and depth, the specific strand that crafts a role for financial development as an intervening factor is essentially embryonic. Therefore, in this section, recourse is fleetingly made first to the general empirical discourse after which a glimpse of the strand particularly relevant to this study is caught. On the basis of the foregoing,

[1] We report results for only 11 countries as the limited number of observations in the cases of Congo Republic, Mali, Mauritius, Uganda and Zambia - countries *ab initio* conjectured might enrich the analysis - precludes attributing any long-run association among the variables of interest. For these countries data was only available for 1988 to 2005, rendering them unfit for our eventual sample.

therefore, a terse presentation of the empirical evidence on the FDI-FD-growth linkage is forewarned in what ensues.

A huge body of literature exists on the influence of FDI on economic growth which typically explores various aspects of the spillover effects of FDI such as technology transfer, introduction of new processes, productivity gains and opening of new market opportunities (Egwaikhide *et al*, 2005).[2] The potential benefits from these spillovers have, however, been argued to be a consequence of a number of receiving country characteristics including, but not confined to, trade orientation, human capital development, institutional arrangements and, more recently, development of domestic financial systems. Some of these thoughts are given a momentary peep in what follows, while the gaps which this study seeks to fill are highlighted at the tail of the section. To kick off, Balasubramanyam *et al*, (1996), Borensztein *et al*, (1998) and Carkovic and Levine (2003) observed that FDI effects on growth are not necessarily positive. This hazy picture suggests that the influence of FDI on growth might be 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 were suggested as factors that predispose the host country to reaping the growth related benefits of FDI (Blomstrom *et al*, 1992; Borensztein *et al*, 1998; Balasubramanyam *et al*, 1996).

However, substantial research efforts have more recently been geared towards understanding the role of domestic financial markets in the FDI-Growth nexus (details in Hermes and Lensink, 2003; Omran and Bolbol, 2003; Alfaro *et al*, 2004; Durham, 2004; and Ang, 2008).[3] 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 a host economy's ability to absorb the benefits of FDI.

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 for SSA is at best rudimentary. An arguably clear exception, nevertheless, is Adeniyi *et al*,'s (2012) study which examined the causal linkage between foreign direct investment(FDI) and economic growth -in Cote' d'Ivoire, Gambia, Ghana, Nigeria and Sierra Leone- with

[2] See Saggi (2000), for instance, for an excellent survey on the spillover effects of FDI.

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

financial development accounted for over the period 1970-2005 within a trivariate vector error correction setting. Their 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. They conclude that, going forward, what should be of utmost urgency is concerted efforts to upgrade financial structure in these countries.

Nonetheless, most of scant empirical attempts have been, typically, conducted either purely for developed countries or with samples of countries that include a few from Africa. To fill this gap, therefore, this 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 SSA countries. To the best of our knowledge, empirical works on this tripartite relationship are scarcely available to this region. Second, a panel data approach is adopted implying that policy prescriptions are more likely to be based on credible estimates since the pooling of both cross sectional and time series dimensions of the data increases not only the number of observations but also the information content of obtained estimates. Third, we use alternative indicators of financial development to reflect the variations in the policy implications related with distinct dimensions of financial system advancement. Fourth, the presence of non-linearities is probed via the inclusion of higher-order interaction terms of financial deepening and FDI. Hence, we subsequently pursue a concise characterization of the domestic financial sectors of sample countries with a view to providing a compelling context for the discussion of eventual estimation outcomes.

3. FINANCIAL SECTOR DEVELOPMENT TRENDS IN SUB-SAHARAN AFRICA

This section provides a snapshot of financial deepening in the selected SSA countries. Our subsequent analysis will focus on context within which financial development is incorporated into the FDI-growth space. Again, as in the previous section, we tersely describe.

Table 1 shows that the experiences of SSA countries with financial development vary across countries. Total domestic credit provided by the banking sector as a percentage of GDP, on average, ranged respectively from 16.55 per cent (Burundi) to 85.41 per cent (South Africa) over the 1975-84 period. All three financial indicators were positive for all countries and sub-periods. It is particularly instructive that substantial variations in pattern emerge with respect to the importance of financial market variables both across countries and over time across individual countries. Specifically, for example, while total liquid liabilities to GDP for Madagascar rose from 19.49 per cent in 1975-84 to 22.90 per cent in 1985-94, the same indicator fell in Ghana from 20.35 per cent to 16.56 per cent over the same time period.

Table 1. Financial Market Indicators for Some Selected Sub-Saharan African Countries, 1970-2005

Country	Total Domestic Credit provided by the banking sector (average % of GDP)			Total Liquid Liabilities (average % of GDP)			Total Credit to the private sector (average % of GDP)		
	75-84	85-94	95-05	75-84	85-94	95-05	75-84	85-94	95-05
Burundi	16.55	23.40	30.61	15.20	18.19	2.25	8.72	13.05	22.06
Cameroon	24.36	26.82	15.61	21.48	20.42	15.73	26.32	21.11	8.62
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
Kenya	39.28	49.89	41.11	37.85	45.20	40.68	26.93	31.27	27.61
Madagascar	31.76	33.32	15.48	19.49	22.90	23.75	17.250	17.47	9.58
Nigeria	26.45	32.37	16.49	26.87	26.03	20.88	12.53	12.51	13.39
Senegal	43.66	36.62	23.41	28.17	24.01	27.43	36.96	27.62	18.96
Sierra Leone	32.09	34.10	46.80	21.00	17.50	16.16	6.55	3.60	3.06
South Africa	85.41	102.42	157.21	56.95	52.37	49.31	62.64	82.47	126.79

Source: Authors' computation from IMF's *International Financial Statistics* (2007).

Similarly, in terms of claims exclusive to the domestic private sector, South Africa clearly has the most sophisticated financial system relative to the other countries. This dominance is significant across measures although the total size of the financial sector appears to have declined: for example, the M3 to GDP ratio falls from 56.95 per cent in 1975-84 to 49.31 per cent in 1995-2005. Sierra Leone performs worst on a similar count with the lowest amount of credit reaching domestic private sector. This implies that credit constraints are relatively more binding on Sierra Leone's private sector operators. This country is, however, almost similar with Gambia, Ghana and Nigeria with regard to M3 to GDP ratio.

In sum, even with similar overall financial sector size and deposit money bank credit in these countries, there are still disparities with regard to overall ability of the financial sector to develop private sector by stimulating investment and subsequent growth. Therefore, a cross-country time-series assessment of the extent of financial sector sophistication is crucial to the understanding of how FDI, via its interaction with financial development, might exert positive influence on growth. Such panel econometric approach is promising since it offers better estimates by using more data. To pursue these issues further, the model, data and econometric technique used are examined in what follows.

4. EMPIRICAL MODEL, DATA AND ECONOMETRIC METHODOLOGY

This section contains the specification of the relationship between growth and FDI via financial sector development. Also, the description and measurement of the variables used in the empirical analysis is presented. Finally, we explain the adopted panel econometric approach.

4.1. Model and Variable Description

Based on our earlier discussions, on the FDI-growth linkage via the financial sector, the empirical model for this study is specified as:

$$GROWTH_{it} = f(CAP_{it}, FD_{it}, FDI_{it}, FD_{it} * FDI_{it}, CONRTROLS_{it}), \quad (1)$$

where $GROWTH_{it}$ is real per capita GDP, CAP_{it} is the gross fixed capital formation expressed as a percentage of GDP, FD_{it} proxies financial sophistication, and three measures are employed for this study - the ratio of M3 to 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.[4]

These alternative indicators of financial development are included with a view to capturing the diversity of opinions on the precise definition of financial sector development.[5] The ratio of M3 to 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 claims on the private sector as a ratio of GDP. The number of countries for which these

[4] It is noteworthy that the empirical analysis pursued in the present study relies solely on these three distinct indicators of financial development. This is with a view to ascertaining whether the influence of financial development on the foreign capital flows- economic growth nexus is robust to the choice of FD indicator. The outcome of this exercise is important for a better alignment of policy prescriptions based on the multi-dimensionality of FD. We are grateful to an anonymous reviewer for opening our minds to this concept of "multi-dimensionality" of FD. Nonetheless, we refrain from using a composite variable for FD (based on its first principal component) as such aggregation precludes the possibility of assessing the variability or otherwise of our financial development measures – a major contribution of the work.

[5] The paper by Adeniyi *et al*, (2012) provides further details on the definition and measurement of these alternative financial development indicators.

financial market variables were obtained for this study is 11.[6]

FDI_{it} refers to foreign direct investment to GDP ratio while $FD_{it} * FDI_{it}$ is the interaction term between these two variables.[7] In the same vein, $CONRTROLS_{it}$, in line with the growth literature, includes some conditioning factors such as inflation, government expenditure as a share of GDP and a measure of trade openness. This conditioning or control set are typically included to reduce omitted variable bias which is important especially in studies with measures of economic growth on the left hand side. It is prime to note that government spending choices and inflation are included since they, to a large extent, signal the effectiveness of fiscal and monetary policies in the FDI-receiving economy. Annual data spanning the period 1970-2005 was used in the study.[8] All data were obtained from the World Bank's *World Development Indicators*, 2007 and the IMF's *International Financial Statistics*, 2007.

4.2. Econometric Methodology

It is by now routine, in the empirical literature, to bump into formal tests of stationarity and possible cointegration in panel settings. The underlying logic of this practise is not unconnected with the spuriousness that epitomises both the estimates and inferences derived from imposing intrinsically static estimation techniques on data that are more often than not non-mean reverting. To this end, each of the variables entering the estimable equation (1) should be tested for the presence of unit roots. Subsequently, the corresponding cointegration test for any long-run connectedness among the variables should also be conducted.[9] Ultimately, panel estimation techniques -both pooled and fixed effects- are employed to estimate coefficients which describe the underlying economic relationships among the variables of interest and help to gain invaluable insights into associated meanings.

To reiterate, two different panel estimation techniques -pooled OLS and fixed effects- are initially used. From a theoretical standpoint, the choice of the more appropriate approach should be dictated by a number of standard diagnostic tests on

[6] Although market-based financial indicators such as stock value traded and market capitalization are important, this study focuses on bank-based measures only since the stock markets in most of these countries are, at best, rudimentary.

[7] The use of interaction effects in this instance poses no threat as the correlation matrix, shows that foreign direct investment is not strongly correlated with any of the three financial development measures. Thus, concerns about multicollinearity are insignificant.

[8] Data was available for Burundi, Cameroon, Cote'd'Ivoire, Gambia, Ghana, Kenya, Madagascar, Nigeria, Senegal, Sierra Leone and South Africa over the period 1970-2005.

[9] These unit root and cointegration approaches are by now commonplace. Therefore, the algebraic mechanics of each is precluded here, while the precise details are well ground out in the respective papers by Levin *et al*. (2002), Im *et al*. (2003) and Pedroni (1999).

specific datasets. In practice, however, it is frequently difficult to know which technique is more reliable since each of the techniques has its strengths and weaknesses. For instance, a pooled OLS model implicitly assumes there is no problem of omitted variables in a model, which is hardly likely to be true. However, in the event that this assumption is correct, the estimates from OLS are superior to those of competing estimators. In a similar vein, the fixed-effect specification allows for intercept shifts for each country. In this way, country-specific characteristics that plausibly drive the economic relationship are accounted for obtaining better estimates. Its drawback, nevertheless, is that this is accomplished by creating dummies for all but one of the countries in the sample. Hence, the upshot is a marked reduction in degrees of freedom, the severity of which deepens as the size of the sampled countries increases. Based on the pros and cons explained, the results for both approaches are reported.

Finally, a quite growing strand of the literature suggesting economic growth as a deep determinant of foreign direct investment (FDI) flows exists. Therefore, the importance of taking the likelihood of potential endogeneity into consideration cannot be over-emphasised. Its failure could lead fundamentally to biased estimates which offer next to nil statistical and/or economic meaning. To deal with this in our sample, an instrumental variable estimator -two stage least squares (2SLS)- is used to control for the possible influence of endogenous regressors. In the next section, the results from preliminary data testing as well as the eventual estimations are presented and discussed.

5. EMPIRICAL RESULTS AND DISCUSSION

This section begins with the presentation and subsequent interpretation of the results of the unit root tests conducted. It then goes further to query the likelihood of cointegration among the variables before proceeding with the panel estimations and the explanation of derived estimates. The section ends up with some sensitivity checks to ascertain model robustness.

Table 2 displays the results for both the Levin *et al*. (2002) and Im *et al*. (2003) stationarity tests. First, both statistics are consistent in their decisions on the order of integration of each of the variables tested. Second, the null hypothesis of unit roots can be rejected in the levels of growth, foreign direct investment and inflation in the panel as a whole. Third, investment, government spending, openness and the three measures of financial sector development are I (1). Previous studies suggest that spuriousness may typically exist in a static regression on equation (1) unless the existence of cointegrating relationship is established prior to such estimation.

Table 2. Panel Mean Reversion Test Results

	Levin *et al*. (2002)				Im *et al*. (2003)				Decision
	Level		1st Diff		Level		1st Diff		
	Statistics	P-value	Statistic	P-value	Statistic	P-value	Statistic	P-value	
GROWTH	-8.535	0.000*	-	-	-10.267	0.000*	-	-	I(0)
CAP	-0.719	0.236	-12.773	0.000*	-0.152	0.439	-12.841	0.000*	I(1)
FDI	-3.042	0.011**	-	-	-3.336	0.000*	-	-	I(0)
FD 1	-0.349	0.363	-8.554	0.000*	0.793	0.786	-8.662	0.000*	I(1)
FD 2	0.353	0.638	-6.923	0.000*	0.058	0.523	-10.486	0.000*	I(1)
FD 3	0.174	0.569	-9.408	0.000*	0.880	0.810	-9.432	0.000*	I(1)
INFL	-5.585	0.000*	-	-	-5.372	0.000*	-	-	I(0)
GOVEXP	-1.100	0.136	-9.881	0.000*	-0.847	0.229	-11.049	0.000*	I(1)
OPEN	-1.168	0.122	-11.941	0.000*	-1.643	0.053	-13.629	0.000*	I(1)

Notes: * and ** designate statistical significance at the 1 and 5 per cent levels respectively, while FD 1 is the ratio of banking sector credit to GDP. Also, FD 2 and FD 3 are, respectively, total liquid liabilities and credit to the private sector measured as a share of GDP. INFL, GOVEXP and OPEN represent the inflation rate, government expenditure to GDP ratio and degree of openness indicators.

To deal appropriately with this spurious regression problem, the class of cointegration tests suggested in Pedroni (1999) whose results are summarised in Table 3. The results are indicative, with the exception of the v-statistics for both within -and between- dimensions, of the existence of a long-run relationship implying that static panel estimators like the ordinary least squares (OLS) and fixed effects (FE) are appropriate for the subsequent analyses.

Table 3. Pedroni Panel Cointegration Test Results

	Within-dimension (Panel)				Between-dimension (Group)		
	v-Stat	rho-Stat	PP-Stat	ADF-Stat	rho-Stat	PP-Stat	ADF-Stat
Model with FD 1	-0.238	-1.517***	-3.096*	-1.377***	-0.822	-3.919*	-1.534***
Model with FD 2	-0.231	-1.653**	-3.219*	-1.479***	-0.951	-3.462*	-1.558***
Model with FD 3	-0.650	-1.142	-2.944*	-2.056**	-0.998	-4.277*	-1.899**

Notes: The test statistics are normalized to approximate, asymptotically, a standard normal distribution. *,** and *** denote significance at the 1,5 and 10 per cent levels, respectively. The corresponding values are 2.326, 1.644 and 1.281. Also, FD 1 , FD 2 and FD 3 represent the ratio of banking sector credit to GDP, total liquid liabilities to GDP and credit to the private sector measured as a share of GDP, respectively. It is equally important to note that each of the cointegration specifications also include the other I(1) variables namely OPEN, GOVEXP and CAP.

Turning now to the estimation results, Table 4 shows that FDI is positively associated with economic growth with the coefficients of the FE models substantially higher in magnitude than those of the OLS models. However, this positive growth influence finds statistical importance only in the baseline FE model and the FE model which includes FD2 (total liquid liabilities to GDP ratio). In line with mainstream macroeconomics principles, investment -gross fixed capital formation as a share of GDP- is a significantly positive spur on growth. For instance, a 10 per cent increase in investment raises output growth by around 1.6 per cent on average. Not surprisingly, inflation, an indicator of macroeconomic stability, shows up as a significant drag on growth in all reported regressions. Depending on the set of controls included, the range of estimates stood at -0.028 to -0.029 and -0.043 to -0.047 for the OLS and FE models, respectively. The degree of trade openness positively affects: a 10 per cent increase in openness raising output by about 0.5 per cent in the FE models in all models and irrespective of FD indicator adopted. The sizes of the equivalent OLS estimates are typically only about a third of this value. The model with the most favourable R^2 stood at 14 per cent. This plausibly reflects the notion that the overall explanatory power of the regressors, about the variability of economic growth, is not so high.

The OLS estimates, for fairly obvious bias reasons, also understate -relative to FE- the negative influence of domestic inflation on the growth trajectories of these SSA economies. Two of the financial development indicators -FD1 and FD3- on one hand do not appear to influence growth significantly, while FD2 has a significant and positive impact on the other. This is indicative of the importance of financial system improvements on economic growth in the selected countries, consistent with a number of prior findings including King and Levine (1993), Benhabib and Spiegel (2000), Durham (2004) and Choong and Lam (2011) among others. The FE estimates, are mostly larger than their OLS counterparts by at least a factor of three. These FE estimates, suggest that a 10 per cent rise in total liquid liabilities to GDP ratio (FD2) lowers growth by 1.4 percentage points. Government expenditure (except for the OLS model with FD2 included) exerts a negative influence on growth although statistically insignificant. This result is consistent with Choong *et al*. (2010) who also surprisingly find a broad negative effect of government spending on economic growth in their panel of 65 developing countries. However, this relationship was statistically significant in a few models which quite sharply contrast with the evidence reported in this study. Presumably, the intuition behind this finding is that a lopsided pattern of public spending which is ubiquitous in SSA may through well established channels -such as corruption, rent- seeking and forms of patronage- create incentives adverse to investment in the most productive sectors. It could bring slower rather than accelerated growth. The models at best, nonetheless, predict just about one-fifths of the observed average growth performance both over time and across countries.

Table 4. Panel Estimates for Foreign Direct Investment -Financial Development-Economic Growth Linkage

	Regressand : GROWTH							
	OLS	FE	OLS	FE	OLS	FE	OLS	FE
FDI	0.125	0.180	0.115	0.153	0.114	0.210	0.115	0.137
	(1.429)	(1.759)***	(1.326)	(1.491)	(1.267)	(1.922)***	(1.316)	(1.388)
CAP	0.121	0.117	0.129	0.126	0.178	0.173	0.131	0.134
	(3.677)*	(3.443)*	(3.820)*	(3.129)*	(4.742)*	(4.248)*	(3.875)*	(3.261)*
OPEN	0.022	0.052	0.018	0.045	0.011	0.048	0.017	0.045
	(1.665)***	(1.906)***	(1.194)	(1.670)***	(0.704)	(1.822)***	(1.165)	(1.672)***
INFL	-0.029	-0.047	-0.028	-0.044	-0.029	-0.044	-0.028	-0.043
	(-1.875)***	(-2.576)**	(-1.802)***	(-2.425)**	(-1.858)***	(-2.410)**	(-1.821)***	(-2.344)**
GOVEXP	-0.036	-0.019	-0.025	-0.020	0.002	-0.033	-0.023	-0.032
	(-1.117)	(-0.483)	(-0.756)	(-0.580)	(0.061)	(-0.770)	(-0.695)	(-0.920)
FD1			0.002	0.002				
			(0.452)	(0.228)				
FD2					0.043	0.142		
					(2.387)**	(3.129)*		
FD3							0.004	0.013
							(0.619)	(0.950)
R-SQUARED	0.072	0.108	0.070	0.103	0.086	0.141	0.071	0.106
F-Statistics	6.034	3.070	4.891	2.546	6.107	3.657	4.914	2.799
Hausman Statistic		4.83		4.45		3.89		4.13
Number of Observations	396	396	396	396	396	396	396	396

Notes: The values housed in parentheses are the t-statistics. *,**,*** represent statistical significance at the 1,5,10 per cent levels, respectively. OPEN, INFL and GOVEXP are, in that order, degree of openness as a share of GDP, inflation rate and government expenditures as a percentage of GDP. FD 1, FD 2 and FD 3 denote banking sector credit, total liquid liabilities (M3) and credit to the private sector. These three financial indicators are also measured as a percentage of GDP. All other variables retain their earlier definitions. The displayed results, from Hausman chi-squared test, are suggestive of a better regression fit using the fixed effects (FE) estimator as against the random effects (RE) model.

To gauge whether, as earlier hypothesised, the influence of FDI on growth works through the financial sector channel, models with interaction terms between FDI and FD are estimated and the result displayed in Table 5. As the table shows, FDI -very much like in Table 4- continues to positively affect growth but statistically insignificant in most models. The positive role of investment, is larger than those reported in Table 4. Table 5 shows that, openness exerts a positive influence on growth but the sizes of the coefficients are somewhat smaller as compared with Table 4.

Table 5. Panel Estimates for Foreign Direct Investment -Financial Development-Economic Growth Linkage (Interaction Terms)

	Regressand : GROWTH					
	OLS	FE	OLS	FE	OLS	FE
FDI	-0.016	0.074	0.014	0.156	0.373	0.367
	(-0.140)	(0.485)	(0.142)	(1.121)	(1.263)	(1.164)
CAP	0.136	0.128	0.190	0.178	0.135	0.143
	(3.987)*	(3.189)	(4.952)*	(4.312)*	(3.954)*	(3.404)*
OPEN	0.017	0.042	0.011	0.046	0.015	0.041
	(1.146)	(1.531)	(0.740)	(1.713)***	(1.001)	(1.501)
INFL	-0.027	-0.044	-0.028	-0.043	-0.028	-0.043
	(-1.768)***	(-2.408)**	(-1.775)***	(-2.370)**	(-1.822)***	(-2.335)**
GOVEXP	-0.021	-0.021	-0.002	-0.037	-0.020	-0.042
	(-0.619)	(-0.589)	(-0.057)	(-0.853)	(-0.621)	(-1.179)
FD1	0.007	0.002				
	(1.039)	(0.121)				
FD2			0.051	0.139		
			(2.642)*	(3.057)*		
FD3					0.003	0.016
					(0.367)	(1.191)
FDI*FD1	0.003	0.002				
	(1.542)	(0.817)				
FDI*FD2			0.004	0.002		
			(1.689)***	(0.613)		
FDI*FD3					0.007	0.006
					(0.901)	(0.820)
R-SQUARED	0.073	0.103	0.094	0.141	0.072	0.108
F-Statistics	4.397	2.546	5.736	3.657	4.319	2.691
Hausman Statistic		4.47		4.22		3.91
Number of Observations	396	396	396	396	396	396

Notes: The values housed in parentheses are the t-statistics. *,**,*** represent statistical significance at the 1,5,10 per cent levels, respectively. OPEN, INFL and GOVEXP are, in that order, degree of openness as a share of GDP, inflation rate and government expenditures as a percentage of GDP. FD 1, FD 2 and FD 3 denote banking sector credit, total liquid liabilities (M3) and credit to the private sector. These three financial indicators are also measured as a percentage of GDP. FDI*FD's 1, 2 and 3 are interaction terms for each financial indicator. All other variables retain their earlier definitions. The displayed results, from Hausman chi-squared test, are suggestive of a better regression fit using the fixed effects (FE) estimator as against the random effects (RE) model.

With the inclusion of interaction terms into the regression openness for economic growth becomes statistically insignificant. Only in the FE model with FD2, the variable becomes significant at a 10 per cent significance level. Goodness-of-fit of the model is indistinguishable, based on R^2 from those contained in Table 4.

The negative influence of inflation stands robust to the inclusion of interaction terms. The size of this impact does not differ when Table 5 is compared with Table 4. Government spending is negatively related to output growth despite the statistical insignificance that emerges as was the case with the models -without interaction effects- summarised in Table 4. Again, the interaction term becomes significant only when FD2 was adopted as financial development indicator. This coincides with the significance of FD2 in both OLS and FE growth models.

There are a number of cautions associated with the approach we have followed so far. The most important is the issue of endogeneity which could bias the estimates reported in Tables 4 and 5. To deal with this, an instrumental variable (IV) estimator is used to account for influence of potential endogenous regressors. There is ample reason to select this estimator method because a large literature has demonstrated economic growth as one of the fundamental drivers of FDI flows.

The result of the two-stage least squares (IV) estimation is reported in Table 6. Broadly speaking, the estimates are indistinguishable from their OLS counterpart (repeated in the same table for ease of comparison) regardless of the choice of financial development measure.

Looking a little deeper, however, a few interesting results emerge. First, surprisingly, investment has a positive but insignificant effect on growth whereas openness which had no statistically important influence in the OLS regressions becomes significant at a 1 per cent significance level. Second, the expected negative effect of inflation is retained when endogeneity is taken care of, but statistical significance is cost. Third, the two financial indicators -banking sector credit and credit to the private sector- become statistically significant with the 2SLS estimation, while total liquid liabilities become statistically insignificant. Overall, nonetheless, the OLS and 2SLS results are similar both qualitatively and quantitatively. This suggests a small, if any, role for potential endogeneity. Also on Table 6, we find a slight improvement in the coefficient of determination (R-square) across the board. Finally, government expenditure in Table 6 (similar to Tables 4 and 5) shows a negative association with economic growth. This finding of counter-cyclical government expenditure can plausibly be accounted for by huge recurrent budgets, inefficient capital spending and widespread graft among others. A number of these features are common among SSA economies. Alternatively, this growth-retarding effect of government spending could also be plausibly explained by lagged effects arising, for instance, from delays in output growth response following expansionary fiscal policy especially during economic recession.[10]

[10] We ascribe the credit of this incisive alternative explanation of our finding to an anonymous referee.

Table 6. Panel Estimates for Models Controlling for Endogeneity

Regressors	OLS	2SLS	OLS	2SLS	OLS	2SLS
FDI	0.115	0.174	0.114	0.191	0.115	0.167
	(1.326)	(1.543)	(1.267)	(1.226)	(1.316)	(1.118)
CAP	0.129	0.019	0.178	-0.023	0.131	0.016
	(3.820)*	(0.332)	(4.742)*	(-0.42)	(3.875)*	(0.268)
OPEN	0.018	0.092	0.011	0.101	0.017	0.095
	(1.194)	(2.764)*	(0.704)	(3.158)*	(1.165)	(2.888)*
INFL	-0.028	-0.032	-0.029	-0.041	-0.028	-0.033
	(-1.802)***	(-0.851)	(-1.858)***	(-1.081)	(-1.821)***	(-0.872)
GOVEXP	-0.025	-0.123	0.002	-0.106	-0.023	-0.119
	(-0.756)	(2.161)**	(0.061)	(-1.858)***	(-0.695)	(-2.137)**
FD1	0.002	0.001				
	(0.452)	(2.101)**				
FD2			0.043	0.002		
			(2.387)**	(0.416)		
FD3					0.004	0.001
					(0.619)	(1.692)***
R-SQUARED	0.070	0.102	0.086	0.082	0.071	0.101
F-Statistics	4.891	2.062	6.107	1.661	4.914	1.976
Number of Observations	396	363	396	363	396	363

Notes: The values housed in parentheses are the t-statistics. *,**,*** represent statistical significance at the 1,5,10 per cent levels, respectively. OPEN, INFL and GOVEXP are, in that order, degree of openness as a share of GDP, inflation rate and government expenditures as a percentage of GDP. FD 1, FD 2 and FD 3 denote banking sector credit, total liquid liabilities (M3) and credit to the private sector. These three financial indicators are also measured as a percentage of GDP. All other variables retain their earlier definitions. Finally, beginning with lag 2, two lags of each of the potentially endogenous (specifically FDI, CAP and all three FD measures) explanatory variables form the set of instruments used in the 2SLS regressions. Over-identifying restriction test results -not displayed here- suggest the exercise of caution on pushing the validity of these internal instrumental variables too far. While not detracting from the significance and meaning of the reported estimates, these instruments were somewhat weaker than expected on average.

6. CONCLUSION

The extent to which the potential growth-promoting effects of foreign direct investment can be appropriate has in recent times been linked to the development of the financial system especially in developing countries - SSA inclusive. To empirically pursue this line of reasoning, this study examined the influence of financial development on the relationship between FDI and economic growth in a sample of 11 SSA countries over the period 1970 to 2005. Panel data estimation techniques -OLS and FE- were

employed to address the key questions. In general, as the findings showed, foreign direct investment positively impacts on economic growth, while inflation exerts a negative influence in line with the macroeconomic instability suggested by continuously soaring domestic prices. Nevertheless, the impact of FDI on economic growth appeared to be statistically insignificant in most models. This outcome is plausibly due to the nature and associated destination of foreign direct investment flows into developing countries more generally and SSA in particular. It is no longer news that FDI goes primarily into the extractive sector in these countries on the one hand, while the challenges of economic, political and corporate governance distortions distinctive to SSA resource-rich states are equally common knowledge on the other. This fact may delink the resource sector from the rest of the economy, implying that the growth effects of FDI flows may be hindered. Nonetheless, financial development also has a positive effect on growth both in the pooled as well as FE models. However, somewhat surprisingly, only the credit to the private sector to GDP measure had statistical importance. It is equally noteworthy that all conventional growth regression control variables returned the expected signs save for the negative, albeit insignificant, coefficient on government expenditure. Moreover, controlling for endogeneity using the 2SLS estimator did not alter these findings overall, indicating little or no bias in the estimates from both OLS and FE in all the models. Digging further into the likelihood of non-linearities, the results indicated that the intervening role of financial development in the FDI-growth association became apparent only after a certain threshold of FD is exceeded. At least two subtle policy implications can be drawn. First, these countries would benefit -in growth terms- more from foreign capital flows if existing financial sector reforms are broadly implemented and subsequently sustained. Second, driving financial sector development more towards enhancing the domestic private sector's access to credit would be beneficial for brighter economic prospects for these countries.

APPENDIX

A1. Data Definition and Source

Variables	Definition	Source
Credit to the Private Sector	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	Currency plus demand and interest bearing liabilities of financial intermediaries and non-bank financial institutions divided by GDP	International Financial Statistics
Total Banking	Credit by deposit money banks to the private	International Financial

Sector Credit to the Private Sector	sector as a ratio of GDP	Statistics
Growth	Output growth as measured by year on year changes in the real GDP	World Development Indicators
Openness	Exports plus Imports divided by GDP	World Development Indicators
Foreign Direct Investment	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. This is expressed in percentage of GDP	International Financial Statistics
Government Spending	Total final government expenditure as a share of GDP	World Development Indicators
Inflation	Percentage changes in the GDP deflator	World Development Indicators
Investment	Gross fixed capital formation including outlays on additions to the fixed assets of the economy plus net changes in the level of inventories as a share of GDP	World Development Indicators

REFERENCES

Adeniyi, O., F.O. Egwaikhide, A. Oyinlola, and O. Omisakin (2012), "Foreign Direct Investment, Economic Growth and Financial Sector Development in Small Open Developing Economies," *Economic Analysis and Policy*, 42, 105-127.

Albuquerque, R. (2003), "The Composition of International Capital Flows: Risk Sharing through Foreign Direct Investment," *Journal of International Economics*, 61, 353-383.

Alfaro, L., C. Areendam, S. Kalemli-Ozcan, and S. Sayek (2004), "FDI and Economic Growth: The Role of the Financial Markets," *Journal of International Economics*, 64, 89-112.

Ang, J. (2008), "A Survey of Recent Developments in the Literature of Finance and Growth," *Journal of Economic Surveys*, 22, 536-576.

Balasubramanyam, V.N., S. Mohammed, and D. Sapsford (1996), "FDI and Growth in EP and IS Countries," *Economic Journal*, 106, 92-105.

Benhabib, J., and Spiegel, M.M. (2000), "The Role of Financial Development in Growth and Investment," *Journal of Economic Growth*, 5, 341-360.

Blomostrom, M., R. Lipsey, and M. Zejan (1992), "What Explains Growth in Developing Countries?" NBER Working Paper, 4132.

_____ (1994), "What Explains the Growth of Developing Countries?" in W. Baumol, R. Nelson, and E.N. Wolff, eds., *Convergence of Productivity: Cross-National Studies and Historical Evidence*, Oxford: University Press.

Borensztein, E.J., J.W. de Gregorio, and J.W. Lee (1998), "How Does FDI Affect Economic Growth?" *Journal of International Economics*, 45, 115-135.

Carkovic, M., R. Levine (2003), "Does Foreign Direct Investment Accelerate Economic Growth?" University of Minnesota, Working Paper.

Choong, C-K., and S-W. Lam (2011), "Foreign Direct Investment, Financial Development and Economic Growth; Panel Data Analysis," *The IUP Journal of Applied Economics*, 10, 57-73.

Choong, C-K., Z. Yusop, and S-H. Law (2010), "Private Capital Flows to Developing Countries: The Role of the Domestic Financial Sector," *Journal of the Asia Pacific Economy*, 15, 509-529.

De Mello, L.R. (1997), "Foreign Direct Investment in Developing Countries and Growth: A Selective Survey," *Journal of Development Studies*, 34, 1-34.

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

Egwaikhide, F.O., E. Udoh, K.I. Obiora, and E.K. Ogunleye (2005), "Foreign Direct Investment in the West African Monetary Zone: An Assessment of Flows, Volatility and Growth," *West African Journal of Monetary and Economic Integration*, 5, 137-150.

Errunza, W. (2001) "Foreign Portfolio Equity Investment, Financial Liberalization and Economic Development," *Review of International Economics*, 9, 703-726.

Hermes, N., and R. Lensink (2003), "Foreign Direct Investment, Financial Development and Economic Growth," *Journal of Development Studies*, 40, 142-153.

Im, K.S, M.H. Pesaran, and Y. Shin (2003), "Testing Unit Roots in Heterogeneous Panels," *Journal of Econometrics*, 115, 53-74.

King, R.G., and R. Levine (1993), "Finance, Entrepreneurship and Growth: Theory and Evidence," *Journal of Monetary Economics*, 32, 513-542.

Kokko, A., and M. Blomstrom (1995), "Policies to Encourage Inflows of Technology through Foreign Multinationals," *World Development*, 23, 459-468.

Lemi, A., and S. Asefa (2003), "Foreign Direct Investment and Uncertainty: Empirical Evidence from Africa," *Africa Finance Journal*, 5, 36-67.

Levine, R. (1997), "Financial Development and Economic Growth: Views and Agenda," *Journal of Economic Literature*, 35, 688-726.

Levin, A., C.F. Lin, and C. Chu (2002), "Unit Root Test in Panel Data: Asymptotic and Finite Sample Properties," *Journal of Econometrics*, 108(1), 1-24.

Omran, M., and A. Bolbol (2003), "Foreign Direct Investment, Financial Development, and Economic Growth: Evidence from the Arab Countries," *Review of Middle East*

Economics and Finance, 1, 231-249.

Oshikoya, T.W. (1994), "Macroeconomic Determinants of Domestic Private Investment in Africa: An Empirical Analysis," *Economic Development and Cultural Change*, 42, 573-596.

Pedroni, P. (1999), "Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors," *Oxford Bulletin of Economics and Statistics*, 61, 653-670.

Reisen, H., and M. Soto (2001), "Which Types of Capital Flows Foster Developing Country Growth?" *International Finance*, 4, 1-14.

Saggi, K. (2000), "Trade, Foreign Direct Investment and International Technology Transfer: A Survey," Policy Research Working Paper, 2349, World Bank.

World Bank (2011), "Migration and Remittances Factbook 2011," Second Edition, Washington, DC: The World Bank. (Available at: http://siteresources.worldbank.org/ INTLAC/ Resources/ Factbook2011-Ebook.pdf)

Mailing Address: Oluwatosin Adeniyi, Department of Economics, University of Ibadan, Ibadan, Nigeria. E-mail:saino78@yahoo.com.

Received May 26, 2014, Revised January 7, 2015, Accepted August 31, 2015.