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The Impact of Asian Foreign Direct Investment, Trade on Africa's Economic Growth

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Abstract: Globalization of capital and especially foreign direct investment (FDI) and trade has increased dramatically over the past decades. In developing economies; FDI has become the most stable and largest component of capital flows. This study examines the interaction between FDI, trade openness and economic growth with a focus on Asian FDI, trade and 13 West African countries for the period 1980-2015. The results from weighted Fully Modified Ordinary Least Squares (FMOLS) show that both FDI and trade significantly contribute to economic growth. The study also indicates that a unidirectional causality runs from FDI to economic growth indicating FDI-growth-led hypothesis while a bidirectional causality is detected between trade and economic growth validating feedback-effect. Increasing FDI could also promote trade by opening and expanding market opportunities.

Keywords: FDI; Trade, Economic growth, Asian countries, African countries

1. INTRODUCTION

A vital economic development of the past couple of decades has been the important rise in the rate of economic globalization. Globalization has operated mostly through three channels: Trade in goods and services; capital mobility; and international policy cooperation. Reductions in trade barriers and the relaxation or elimination of capital controls have led to increases in trade and capital flows that have outpaced the rate of economic growth. The degree of trade (the share of international trade in GDP) and asset (the share of foreign assets in GDP) openness are much higher now in comparison to 25 years ago. Similarly, participation in international organizations (such as the WTO or the AU) has expanded. Globalization has implications for many important issues, ranging from living standards to the distribution of economic and political power.

One such issue that occupies center stage at present in both the research and political agendas is the role of trade and FDI in accelerating growth. Developing countries' trade policies over the years are short term in nature (fiscal yearly reviewed activities) but can be categorized under pre-SAP and post-SAP era. Generally, it is aimed at securing the balance of payments viability and export promotion. In the pre-SAP period, measures mostly adopted to check the pressure on BOP include exchange control measures, import tariff, import licensing to affect the import substitution, industrialization policy, and discriminatory custom tariff structure and, import prohibition. Trade policies during the SAP era were characterized by trade liberalization and the liberalization of the pricing system with emphasis on the use of appropriate price mechanism for foreign exchange allocation among others. The post SAP trade policies also liberalized imports by removing import licensing requirements and instead used customs tariff. The list of items under the prohibition list was drastically reduced (Analogbei, 2000; Antweiler, 2001; Riti and Kamah, 2015). All the above measures are aimed at promoting growth.

Trade and FDI inflows are well known as very important factors in the economic growth process. Trade plays the role of upgrading skills through the importation and adoption of superior production technology and innovation. Exporters use innovation and developed production technology either by acting as subcontractors to foreign enterprises or through international markets competition. Producers of import-substitutes face competition from foreign firms. They are pushed to adopt more capital-intensive production facilities to face the hard competition in developing countries, where products are usually capital intensive (Frankel and Romer, 1999). The impact of trade openness on economic growth can be positive and significant mainly due to the accumulation of physical capital and technological transfer. Inward FDI can play an important role by increasing and augmenting the supply of funds for domestic investment in the host country. This can be done through the production chain when foreign investors buy locally made inputs and sell intermediate inputs to local enterprises. Furthermore, inward FDI can increase the host country's export capacity, causing the developing country to increase its foreign exchange earnings. FDI can also encourage the creation of new jobs, enhance technology transfer, and boost overall economic growth in host countries (Makki & Somwaru, 2004).

With the growing recognition of the successful experience of East and South-East Asia, it is useful for African countries to examine the lessons that could be drawn from the development paths followed in that region, and to consider ways and means of strengthening economic cooperation with Asian economies. One important area of interest in this connection relates to foreign direct investment (FDI) and trade, which has played an increasingly important role in developing Asian economies. Understanding Asian experience and policies on inward FDI could contribute to African countries' capabilities to attract and benefit from FDI. Furthermore, since the late 1980s, outward FDI from the economies of developing Asia has become significant, and even though these cross-border flows have so far remained largely limited to the Asian region they arouse interest as potential sources of investment in Africa.

This interest, which declined somewhat as a result of the Asian financial crisis of 1997-1998, was renewed following the recovery of the crisis-hit countries and the continuing steady growth of the Chinese and Indian economies. The fast-growing Asian economies have come to be viewed not only as successful cases that could provide examples of development paths for African economies but, increasingly, also as economic partners, particularly for trade and investment. This volume focuses on the investment aspects of such South-South cooperation. While still small, FDI flows from Asia to Africa reached $1.2 billion annually during the period 2002-2004, and they are set to increase further in the coming years (UNDP, 2007).

2. LITERATURE REVIEW

Two main theoretical perspectives have been used to explain the impact of FDI on host countries' economies. These are the modernization and dependency theories. Modernization theories are based on the neoclassical and endogenous growth theories, which suggest that FDI could promote economic growth in developing countries. The modernization perspective is based on a fundamental principle in economics that economic growth requires capital investment. From the perspective of the new growth theories, the transfer of technology through FDI in developing countries is especially important because most developing countries lack the necessary infrastructure regarding an educated population, liberalized markets, economic and social stability that are needed for innovation to promote growth (Calvo and Sanchez-Robles, 2002). Kumar and Pradhan (2002) note that, apart from technology and capital, FDI usually flows as a bundle of resources, including organizational and managerial skills, marketing know-how, and market access through the marketing networks of multinational enterprises (MNEs). As a result, FDI plays a twofold function by contributing to capital accumulation and by increasing total factor productivity (Nath, 2005).

In contrast to the modernization perspective, dependency theorists argue that dependence on foreign investment is expected to have a negative effect on growth and the distribution of income. Bornschier and Chase-Dunn (1985) claimed that foreign investment creates an industrial structure in which monopoly is predominant, leading to what they describe as "underutilization of productive forces." The assumption being that an economy controlled by foreigners would not develop organically, but would rather grow in a disarticulated manner (Amin, 1974). This is because the multiplier effect by which demand in one sector of a country creates demand in another is weak and thereby leading to stagnant growth in the developing countries. This argument is important as most FDI to Africa is in the natural resources sectors (Pigato, 2000) which have substantial barriers to entry.

Given the conflicting theoretical views, many empirical studies have examined the relationship between FDI and economic growth in developing countries (Alfaro, Areendam, Kalemli-Ozcan, &Sayek, 2004; Borensztein, De Gregorio,&Lee, 1998; Makki & Somwaru, 2004; Zhang, 2001). Zhang (2001) studied 11 Latin American and Asian countries between 1970 and 1997 and reported that FDI was more likely to promote growth in Asia than in Latin America. Further, Zhang (2001) finds that FDI tends to promote economic growth when the host country adopts liberalized trade policies, improve education, and maintain macroeconomic stability. Similarly, Balasubramanyam, Mohammed and David (1996), in a study of 46 countries from 1970 to 1985 reported that the growth enhancing effects of FDI are stronger in countries with highly educated workforce and pursued a policy of export promotion rather than import substitution. Carkovic and Levine (2002), however, claim that the macro-level positive findings of FDI on growth must be viewed with scepticism as most of the studies do not control for simultaneity bias and country-specific effects. In contrast to the studies that find a positive correlation between FDI and growth, others find a non-significant or negative effect (Akinlo, 2004; Ayanwale, 2007; Fry, 1993; Hermes & Lensink, 2003). Hermes and Lensink (2003), in a study of 67 developing countries for the period 1970–1995, reported that FDI has a significant negative effect on the host country. The differences in the results reviewed show the importance of regional and country-specific studies.

Theoretically, the effects of FDI on economic growth differ from conventional models in recent growth models. In neo-classical analysis, FDI does not influence the long-run growth rate, but only the level of output. An exogenous increase in FDI would increase the amount of capital and income per capita temporarily as diminishing returns (on the marginal product of capital) would impose a limit to this growth in the long run. The impact of FDI on the long-run growth rate can occur only through technological progress or growth of the labor force, which are both considered exogenous. The seminal papers of Solow (1956, 1957) formed the basis for many past empirical studies using the neoclassical model. These studies used the aggregate production function that related the economy's output to capital and labor inputs using macroeconomic series. Investment is integrated as a fixed proportion of output.

Despite the neoclassical model reporting the impact of technological progress on economic growth, it does not explore the determinants of technological progress. The challenge for the new growth theory was to explore the determinants and impacts of technological progress. It focused mainly on incentives that drive innovation, invention, and creation as a main engine of growth (Arrow, 1962; Shell, 1966; Romer, 1986, 1990; Lucas, 1988; Grossman and Helpman, 1991). The models generally assumed constant returns to scale to inputs (i.e. capital and labor), the level of technology was assumed to depend on a set of inputs, and FDI to influence economic growth via variables such as research and development and human capital (Romer, 1986; Lucas, 1988). The technology spillovers from FDI encourage long-run growth, but the extent to which this occurs depends crucially on the stock of human capital and the absorptive capacity of firms in the host country (Borensztein et al., 1998).

The main difference between the neoclassical theory and the new growth theory is the technology function. While the former assumes technological progress to be exogenous, the latter explains technological progress as a form of investment spillover arising from different sources, such as tangible capital, human capital, or research and development expenditures. The main implication of the endogenous growth theory is that policies which induce international trade, competition, change and innovation will promote growth. Conversely, policies which have the effect of restricting or slowing change by protecting or favoring particular existing industries are likely to slow growth over time. The empirical literature studying the impacts of FDI and trade on economic growth is very large.

The effect of each of the two variables of FDI and trade on economic growth has generally been studied for many countries using various sample periods and econometric approaches and methods. The results of some papers studying the effects of trade (or exports) and FDI on economic growth in developing countries are promising (Balassa, 1985; Sengupta and Espana, 1994). There is evidence for the export-led growth hypothesis (ELGH) and the FDI-led growth hypothesis (FLGH). These hypotheses, which are supported, are based on the idea that the exports and FDI variables are the main drivers of economic growth.

Ghirmay et al. (2001) studied the relationship between exports and economic growth in nineteen developing countries using a multivariate causality analysis based on the error correction model. Their results supported a long-run relationship between the two variables only in twelve of the developing countries, with the promotion of exports attracting investment and increasing GDP in these countries. They concluded that the growth process in East Asia is quite different from that in Southeast Asia. By using a bivariate technique and quarterly data for the period from 1976 to 2003, Mamun and Nath (2004) found a long-run unidirectional causality from exports to economic growth in Bangladesh. Narayan et al. (2007) examined the export-led growth hypothesis for Fiji and Papua New Guinea within a multivariate framework. Their results support the ELGH in the long run for Fiji, while for Papua New Guinea there is evidence of ELGH in the short run. Empirical works studying FLGH have found that FDI promotion can greatly benefit host countries through the introduction of new technologies and skills, the creation of new jobs, surging domestic competition and expanding access to international marketing networks.

Boyd and Smith (1992) found that FDI may affect growth negatively due to misallocation of resources in the presence of some distortions in pre-existing trade, price and others. Relying on a variety of cross-country regressions for testing the impact of FDI on per capita GDP, Blomstrom et al. (1994) found that FDI promotes economic growth when per capita GDP is sufficiently high in the host country. Borensztein et al. (1998) studied the effect of FDI on economic growth in a cross-country regression approach. According to their findings, FDI can be an important channel of the transfer of modern technology, but its effectiveness depends on the stock of human capital in the host country. By estimating a mixed fixed and random effect panel data model that allows for cross-country heterogeneity, Nair-Reichert and Weinhold (2001) found that the causal relationship between foreign and domestic investment and economic growth in developing countries is heterogeneous. They justified these results by the homogeneity of assumptions imposed across countries. Sadik and Bolbol (2001) studied the impact of FDI on total factor productivity (TFP) in six Arab countries (Egypt, Jordan, Morocco, Oman, Saudi Arabia and Tunisia) for the period 1978–1998. They found a negative and significant impact of FDI on TFP for the cases of Tunisia, Egypt and Saudi Arabia. They explained their results with the amount of FDI being insufficient to produce significant positive spillover effects and there are some indications that the effect of FDI on TFP has been lower than domestic investment, indicating a possibly dominating negative crowding-out effect. Bashir (2001) tested the relation between FDI and GDP per capita in six south Mediterranean countries (Algeria, Egypt, Jordan, Morocco, Tunisia and Turkey) for the period of 1975–1990 using an endogenous growth model. The estimation of a random effect model showed that the

impact of FDI on economic growth is positive but not significant. The author explained his result by the weakness of FDI inflows captured by these countries during the 1970s and 1980s. For assessing the impact of FDI flows on economic growth, Carkovic and Levine (2002) constructed a panel dataset with data averaged over each of the seven 5-year periods between 1960 and 1995 and used the Generalized Method of Moments (GMM) panel estimator after controlling for the potential biases induced by endogeneity, country-specific effects, and the omission of initial income as a regressor. They found that FDI has no impact on economic growth in the long run.

Athukorala (2003) used the econometric framework of cointegration and an error correction mechanism to capture the linkages between FDI and GDP in Sri Lanka using time series data from 1959 to 2002. He found that FDI has a positive effect on GDP and there is a unidirectional causality running from GDP to FDI in Sri Lanka.

Darrat et al. (2005) investigated the impact of FDI on economic growth in Central and Eastern Europe (CEE) and the MENA regions using a panel dataset to allow for both country and time-specific effects. They found that FDI inflows stimulate economic growth in EU accession countries, while the impact of FDI on economic growth in MENA (including Tunisia) and non-EU accession countries is either non-existent or negative. The authors explained their findings by the EU accession countries strictly and efficiently applying requested reforms that contribute to the creation of positive effects of FDI on economic growth.

Meschi (2006) studied the impact of FDI on economic growth in fourteen MENA countries including Tunisia during the period 1980–2003 using econometric panel data models. The author found that the coefficient of FDI is generally negative. She attributed this result to the high concentration of FDI in the primary sector, mainly the hydrocarbon sector, which produces few technological externalities.

Nicet-Chenaf and Rougier (2009) studied the interactions between FDI and growth in a set of MENA countries including Tunisia using a panel data model. The authors consider the MENA countries to be relevant because they generally do not display positive direct effects of FDI on growth. Their results showed that FDI has no significant direct effect on economic growth but plays an indirect role in growth through its positive effects on the formation of human capital and international integration. They explained these results by the relative weakness of FDI inflows in these countries, which hampers the positive spillover effects of FDI on growth.

Tintin (2012) investigated whether and to what extent FDI spurs economic growth by taking development levels and the quality of host country institutions into account using a panel data model with fixed effects for a sample of 125 countries for the period of 1980–2010. The author used the economic freedoms index to proxy the quality of host country institutions. He found that FDI spurs economic growth and development in developed and developing countries. Nevertheless, the magnitudes of the effects of FDI on economic growth are non-uniform across country groups. The economic freedoms index had a positive and significant effect on economic growth, which implies the importance of high quality institutions for economic growth and development. Research examining the impacts of trade openness and FDI on economic growth within the same model has also delivered ambiguous results. For example, by using cross-section data and OLS regressions,

Balasubramanyam et al. (1996) emphasized trade openness as being crucial for acquiring the potential growth impact of FDI in developing countries. They found that FDI has a positive effect on economic growth in host countries which have an export promoting strategy, but not in countries which have an import substitution strategy.

Alici and Ucal (2003) studied the effect of Turkey's liberalization process on economic growth by investigating a Granger-causal relationship between trade, FDI, and economic growth during the period 1987–2002 on a quarterly basis. They found that there is evidence of ELGH for Turkey but not FLGH because the spillover effects from FDI to GDP are not present.

Caudros et al. (2004) employed a vector autoregressive model to investigate the causal relationship between economic growth, inward FDI and trade from the mid-seventies to 1997 in the Latin American countries (Argentina, Brazil, and Mexico). Their results were the reverse of those of Alici and Ucal (2003). They confirmed the FLGH, but not the ELGH.

Baliamoune-Lutz (2004) found that the impact of FDI on economic growth is positive and there is a bidirectional relationship between exports and FDI in Morocco. This result implies that FDI can also promote exports and vice versa. Using Arellano and Bond's dynamic panel data estimating technique for a panel dataset covering 28 Chinese provinces over the period 1978–2000, Yao (2006) found that both exports and FDI have a positive effect on economic growth.

Hisarciklilar et al. (2006) studied the relationship between economic growth, FDI and trade in some MENA countries for the period 1970–2003 using the Engle co-integration and pairwise Granger Causality tests between all the variables. Their results are similar to those of Darrat et al. (2005), finding no causality between FDI and GDP for most of the Mediterranean countries including Algeria, Cyprus, Egypt, Israel, Jordan, Morocco, Syria, Tunisia and Turkey.

Alaya (2006) found that in the case of Morocco, Tunisia and Turkey, economic growth is mainly determined by exports, domestic investments, and to a lesser extent human capital. The impact of FDI on economic growth is significantly negative. The author explained his results with several points. First, FDI has the tendency to eliminate domestic investments in these countries. Second, FDI inflows are relatively instable. The volatility of FDI inflows is explained by privatization, which becomes one important source of FDI for these countries in certain years. Also, the volatility is often synonymic with an absence of reinvestment and weak integration of foreign firms within the host country.

Rahman (2007) re-examined the effects of exports, FDI and expatriates' remittances on the real GDP of some Asian countries (Bangladesh, India, Pakistan and Sri Lanka) using the ARDL technique for cointegration for the period of 1976–2006. The ARDL technique confirmed a cointegrating relationship among the variables in these three countries. The short-run net effects of exports on real GDP in Bangladesh are more visible than those of FDI. The same applies to India as well, with some minor exceptions for relatively stronger short-run effects. In the case of Pakistan, FDI was found to exert net restrictive effects on its real GDP, though these are not highly significant. For Sri Lanka, FDI had consistently restrictive effects on real GDP.

Alalaya (2010) investigated the relationship between economic growth, trade and FDI for Jordan for the period of 1990–2008 by applying the ARDL model for cointegration. He found a unidirectional causal effect from trade and FDI to economic growth. It was also found that the speed of adjustment in the model is 0.587, which seems relatively high and significant. Marc (2011) studied the effect of FDI on the economies of seven South Mediterranean countries (Algeria, Egypt, Jordan, Morocco, Syria, Tunisia and Turkey) over the period 1982–2009 by using a two stage least squared regression structural model. The author found that human capital and exports are the most dynamic factors in creating positive spillover effects on economic growth. However, the effect of FDI on economic growth is significantly negative. He advanced the same explanation given by Alaya (2006). The empirical literature review implies that the impact of FDI on economic growth is conditioned by some factors. Xu (2000) and Li and Liu (2005) showed that when the technological gap between foreign and local firms is small, the impact of FDI on growth in the host economy will be significant. Some studies

provided robust evidence that the education level is crucial to catalyzing FDI effects on growth because it enables larger technological spillovers obtained from workers' mobility (Blomstrom et al., 1994; Borensztein et al., 1998; Lipsey, 2000; Li and Liu, 2005). It was also shown that trade openness (Balasubramanyam et al., 1996; OECD, 2002), export diversification (Nicet-Chenaf and Rougier, 2009), financial development (Hermes and Lensink, 2003; Alfaro et al., 2004), or a more efficient and stable legal and institutional environment (Bengoa and Sanchez-Robles, 2003) all favor the positive effects of FDI on economic growth.

The results of previous studies on the relationship between FDI and economic growth in MENA and south Mediterranean countries including Tunisia are deceptive, even though the positive effect of FDI on economic growth is theoretically and empirically proven in many other developed and developing countries. The image provided by the analyses of the MENA and some south Mediterranean countries leaves us more perplexed. Most of the analyses concerning those countries agree in explaining the weak performances in attracting FDI by a too limited international and regional integration in this zone and by the slowness and ineffectiveness of structural reforms (privatization, improvement of regulations, the bad quality of institutions, opening and convertibility) to create conditions convenient for the localization of foreign firms.

The sectorial composition of FDI in this region implies an important presence in the sectors of hydrocarbons (raw energy) and the manufacturing industry (textile and clothing industry). Also, the objective of foreign investors in these countries remains the search for cheaper labor. The observed results underline the idea that the effect of FDI depends heavily on the appropriate characteristics of the host country and the nature of the FDI in question. A more favorable effect of FDI is connected to the distribution of externalities or spillover effects from multinationals to local firms. However, such externalities did not take place because of weak links with local firms or a low absorption capacity (Kumar and Pradhan, 2002).

3. RESEARCH METHODOLOGY

3.1 Data collection

The research applies annual time series data over the period 1980-2013 which were gathered from the World Bank data base CD-ROM and United Nations Conference on Trade and Development (UNTACD) for 16 West African Countries that trade with Asian countries. The multivariate framework includes Gross Domestic product (GDP) per capita, measured in real terms of U.S. dollars, Foreign Direct Investments inwards to African countries, measured in US million dollars and trade volumes.

3.2 Panel unit root test

The degree of change of the constant term over countries and time across a cross-section of the important factors prove that the correlations are featured by differences in both changes and error deviations across sections (Apergis and Payne, 2010; Apergis and Ozturk, 2015). And given that the parameter is heterogeneous, panel unit root test is used which gives room for divergent autoregressive elasticities (Hadri, 2000; Narayan et al., 2010; Camarero et al., 2006).

Assuming the following formulation of autoregressive model:

$$y_{it} = \lambda_i y_{it-1} + \pi_i X_{it} + \varepsilon_{it} \quad \ldots\ldots(1)$$

Each country in the panel is represented by i=1,..., N while the time series period is represented by t=1,...,T. The independent variables in the model plus the constant effects are represented by Xit. The autoregressive parameter is represented by λi while the error terms which are assumed to be stationary are represented by εit. In specific terms, the augmented

Dickey–Fuller (ADF) non-stationary analysis is summed up while permitting for various orders of autocorrelation series in the model (Im et al., 2003):

$$\varepsilon_{it} = \sum_{j=1}^{p_i} \varphi_{ij} \varepsilon_{it-j} + \mu_{it} \quad (2)$$

By putting equation (6) into equation (5), gives:

$$y_{it} = \lambda_i y_{it-1} + \sum_{j=1}^{pi} \varphi_{ij} \varepsilon_{it-j} + \pi_i X_{it} + \mu_{it} \quad (3)$$

Where ρi stands for the ADF model's lags. The hypothesis of no difference is that non-stationarity is present in each of the panel series. The hypothesis of difference is that unit root does not exist in at least one of the separate series in the panel. Im et al. (2003) specify a $\tilde{t}$ statistic as the mean of the separate ADF statistics as follows:

$$\bar{t} = \frac{1}{N} \sum_{i=1}^{N} t_{\lambda_i} \quad (4)$$

Here the separate t-statistic for testing the null hypothesis from equation (7) is tρi, and $\tilde{t}$ a statistic is normally distributed under the hypothesis of no difference (Im, et l., 2003). Table 1 shows the outcomes of the Im et al. (2003) panel non-stationary analysis which takes into consideration both constant and trend term. The panel non-stationary analysis shows that variables are stationary at first difference.

3.3 Panel co-integration test

In order to verify the hypothesis of no difference in the absence of the long-run relationship, λi=1, the following non-stationary analysis is performed on the error terms as follows:

$$\varepsilon_{it} = \lambda \varepsilon_{it} + \theta_{it} \quad (5)$$

With the respective variables integrated of the first order, the divergent panel co-integration analysis set-forth by Pedroni (2004) which possibly takes into account the profile mutual dependence with separate individual effects is conducted with the following equations:

$$GDP_{it} = \alpha_i + \delta_i t + \pi_{1i} FDI_{it} + \pi_{2i} TRA_{it} + \varepsilon_{it} \quad (6)$$

Here each country in the panel is represented by i=1..., N while the time period is represented by t=1,..., T. The coefficients αi and δi permit for the respective country specific constant effects and the consequential trends. The deviations from the co-integrating association, known as the estimated residuals are represented by εit. GDP is Gross Domestic Product, FDI is a foreign direct investment, and TRA represents trade.

3.4 Estimation of Panel FMOLS

Given that co-integrating association has been established between the variables, the FMOLS technique for divergences in the long-run panel evaluated to ascertain the co-integrating balance (Pedroni et al., 2001). The idea of FMOLS analysis of variables was first formulated by Philipps and Hansen (1990) to estimate maximum coefficients of long-run analysis of variables. When series are non-stationary, the long-run links could lead to endogeneity in the explanatory variables. Such endogeneity cannot be avoided in the application of reduced form equations of vector auto regression (VAR).

Applying the FMOLS makes corrections in the OLS, account for autocorrelation and the endogeneity problem inherent in the explanatory variables that result from the existence of co-integration between the variables. An example is the following panel of a long run relation system, i-1,..., N countries over time t-1,...,T:

$$Y_{it} = \alpha_{it} + \gamma X_{it} + \varepsilon_{it} \quad \text{.....(11)}$$

3.5 Panel Granger causality test

Given that the variables are co-integrated, a panel VECM introduced by Pesaran et al. (1999) is evaluated to conduct Granger cause-effect analyses. The Engle and Granger (1987) two-step procedure is initiated by first evaluating the co-integrating regression formulated in equation (9) so as to secure the evaluated error terms.

4. DATA ANALYSIS AND INTERPRETATION

4.1 Unit root test result

Table 1 summarizes the analysis of unit root of the underlying variables and levels and first difference, thus:

Table 1: Panel unit root result

	LLC	**Breitung**	**IPS**	**ADF-X²**	**PP-X²**
lnGDP	-1.3664	2.4011	0.5720	20.5513	23.330
ΔlnGDP	-6.5607*	-3.9237*	-10.4701*	147.160*	322.177*
lnFDI	-0.4370	-1.3234	0.7394	18.2577	31,2493
ΔlnFDI	-7.6683*	-6.4243*	-12.7752	188.882*	363.536*
lnTRA	-2.7079	-1.4544	-1.4677	37.3284	47.5458
ΔlnTRA	-6.9805*	-8.4777*	-12.2017*	173.795*	976.778*

Note: * indicates significance at 1% level. LLC = Levine, Lin and Chu t*, IPS = Im, Pesaran and Shin W-stat, ADF = Augmented Dickey Fuller, PP = Phillips Perron

The analysis of the result shows that variables are stationarity at first difference while the variables have unit root at levels.

4.2 Co-integration result

Here, we used two types of co-integration tests suggested by Pedroni (2004). One is the time series-cross section analyses which are focused on the within dimension criteria and which has to do with four statistics: panel v, panel ρ, panel PP, and panel ADF-statistics. While the second one involves three statistics namely: group ρ, group PP, and group ADF-statistics. The results are presented below:

Table 2: Co-integration result

Alternative hypothesis: Common AR Coefficients (within dimension)				
			Weighted	
	Statistic	Probability	Statistic	Probability
Panel v-stat	-1.9339	0.9734	-2.7063	0.9966
Panel rho-stat	-2.8212*	0.0024	-3.1205*	0.0009
Panel pp-stat	-2.8212*	0.0001	-3.4396*	0.0003
Panel ADF-stat	-3.6618*	0.0090	-0.9695	0.1661
Alternative hypothesis: Common AR Coefficients (between dimension)				
Group rho-stat	-2.6819*	0.0037		
Group-pp-stat	-5.2922*	0.0000		
Group-ADF-stat	-2.4839*	0.0065		

Notes: Of the seven tests, the panel v-statistic is a one-sided test where large positive values reject the null hypothesis of no co-integration whereas large negative values for the remaining test statistics reject the null hypothesis of no co-integration. Critical values at the 1% significance level denoted by "*".

The summary of the co integration test shows that both the within and between dimension panel co-integration test statistics attested to the long run attainment of the variables. Out of the within and between dimension tests statistics, six (Panel-rho, Panel PP-statistic, Panel ADF-statistic, Group-rho, Group PP-statistic and group ADF-statistic) do not accept the null hypothesis of the absence of co-integration using the level of significance at 1%. This shows that there is the existence of co-integration among the underlying variables.

4.3 Estimation of coefficients using the FMOLS technique

Given the existence of panel co-integration, the paper estimates coefficients using FMOLS methodology for diverse co-integrated panels. The result of FMOLS coefficients is shown in Table 3.

Table 3: FMOLS coefficients

Variable	Coefficient	Std error	t-statistic	Probability
FDI	0.0888*	0.0313	2.8343	0.0048
TRA	0.1553*	0.0188	8.2267	0.0000
R^2 = 0.7636	Adj R^2 = 0.7550			

Notes: *, ** and *** indicate significance at 1%, 5% and 10% level respectively

The result of the coefficients estimates displays an interesting interaction of the independent variables (Trade and FDI) on the dependent variable (GDPc). A 1% increase in foreign direct investment and trade contributes to 8.88% and 15.53% increase in overall GDP respectively. This is in line with growth hypothesis. Although foreign direct investment and trade contribute to economic growth, the elasticity of trade coefficient performs better than foreign direct investment elasticity and their contributions to economic performance. The overall goodness of fit of the regression line indicates that 76.3% variation in the dependent variable of economic growth (GDPc) being explained by the joint variation in the independent variables (trade and foreign direct investment) while the remaining 23.7% is accounted for by some factors than the two independent variables captured as unaccounted variation of the regression line. On the one hand, our result is consistent with the works of Tintin (2012) for 125 countries; Alic and Ucal (2003) for Turkey economy who found positive impacts of FDI and trade on economic growth. On the other hand, our findings are inconsistent with the works of Meschi (2006) for MENA countries, Hisaratchilar (2006), Darrat (2005) for Mediterranean countries.

4.4 VECM Granger causality result

Table 4 display the result of the Granger causality test in a VECM environment. The analysis is divided into two: short run causality indicated by the partial F-statistic values and the long run causality indicated by the ECM lagged values and the t-statistic.

Table 4: Result of VECM Granger causality

Variable	SR causality			LR causality
	ΣGDP_{t-1}	ΣFDI_{t-1}	ΣTRA_{t-1}	$ECT_{(-1)}$
GDP_t	-	3.5410* [0.0302]	3.3827* [0.0100]	-0.1645* [-8.4061]
FDIt	0.9878 [0.4145]	-	1.5560 [0.1862]	0.5219** [2.1447]
TRA_t	2.7909* [0.0266]	1.0958 [0.3588]	-	-0.0081 [0.8824]

Notes: Partial F-statistics reported on short-run changes in the independent variables. The sum of the lagged coefficients for the respective short-run changes is denoted in parentheses. Probability values are in brackets and reported underneath the corresponding partial F-statistic and sum of the lagged coefficients, respectively.

ECT represents the coefficient of the error correction term and their various t-statistics reported in brackets. Significance at the 1% and 5% level is denoted by "*" and "**" respectively.

Starting with the short run causality, the result indicates that only FDI has a uni-directional causality towards economic growth at 1% level of significance, indicating FDI-growth led hypothesis. However, a bi-directional causality is detected between trade and GDP indicating a feedback hypothesis.

The long run causality shows that when the system is subject to distortions in the short run, the speed of adjustment hovers around 0.1645 (16.45%) and 0.5219 (52.19%) for GDP and FDI components respectively while trade variable shows a slow speed of adjustment of 0.0081 (0.88%) mechanism.

5. CONCLUSION AND RECOMENDATIONS

This study examined the interaction between foreign direct investment, international trade, and economic growth to ascertain the role of Asian FDI and trade on African economic performance. In general, the paper uses a panel data set for 13 countries in West Africa: Benin Republic, Burkina Faso, Cote d'Ivoire, The Gambia, Ghana, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra-Leone and Togo over the period 1980–2015. The results from Pedroni's heterogeneous panel long run relationship analysis show that co-integration exists between GDPc and FDI and trade.

The long run estimates from FMOLS show that both Asian foreign direct investment and trade contribute positively to the economic growth of West Africa countries although trade displays higher elasticity than FDI. The results are in tandem with trade-FDI-led growth hypothesis. In addition, a one-way causality is found running from FDI to economic growth while a feedback effect is detected between trade and economic growth.

Increasing investment and trade from and to Asia could bring benefits to both regions. Asian countries have shown a higher propensity to save than another region. In exchange, Africa offers a wealth of natural resources, while it is largely under-served markets provide investment opportunities for Asian firms. Increasing foreign direct investment flows also promote trade by opening and expanding market opportunities. The government in both Asia and Africa should consider working together to facilitate such investment and trade.

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