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Abstract

Using multivariate cointegration and Innovation Accounting Methods, this paper examines the impact of Foreign Direct Investment (FDI) on stock market development in Ghana. The paper finds long-run relationship between FDI and stock market development in Ghana. Using impulse responses and Variance Decomposition from Vector Error Correction Model we find that increase in FDI significantly influence the development of stock market in Ghana

JEL classification codes: C50**,** F20, G20

Key words: Stock Market Development, Foreign Direct Investment and Market Capitalization

Introduction

The foreign direct investment (FDI) in developing economies has grown rapidly following financial and political transformation. To increase their share of FDI flows, most of the countries easy restrictions on foreign direct investment, strengthened macro stability, privatization of state-owned enterprises, domestic financial reforms, capital account liberalization, tax incentives and subsides have been instituted (World Bank 1997a). In addition, stock markets have been established to intermediate funds towards investment projects. The positive response of these structural changes in attracting FDI and its consequence on its financial markets especially stock market is obvious. FDI to developing economies in West Africa for example increased from $1.9 billion in 1995 to about $15.8billion in 2006.The market capitalization of emerging market countries almost tripled from about $2 trillion to about $5 trillion over the same period. These foreign investors have emerged as major participants in emerging stock markets through purchase of existing equity or recovery of their investment by selling equity in capital markets, but extend of their impact on emerging stock market development of developing countries has receive little attention.

The purpose of this paper is to examine the impact of Net FDI inflow on stock market development in Ghana. Following Garcia and Liu (1999 we proxy stock market development by market capitalization as percentage of GDP (MC/GDP) and volume of stock traded as percentage of GDP (ST/GDP). Demirguc-Kunt and Levine (1996) ague that different individual measures and indexes of stock market development are highly correlated.

Using, Multivariate cointegration test, we find no long –run relationship among FDI, Ghana Cedi –Dollar exchange rate (XR), market capitalization as percentage of GDP and volume of stock traded as percentage of GDP (ST/GDP). Vector Autoregression (VAR) in first difference indicates a minimal short-run relationship between FDI and stock market development.

The paper is structured as follows. Section 2 reviews the literature on FDI and Stock market development. Section 3 provides brief history of stock market development in Ghana. Section 4 provides trends in FDI flow in Ghana. Section 5 provides Data and Methodology and conclusion in section 6.

2. FDI and Stock market development

There has been a considerable research on determinants of financial sector development of late. Garcia and Liu (1999), Demirguc-Kunt and Levine (1996), Yartey and Adjasi (2007), and many more have analyzed the relationship between financial market development and macroeconomic variables, financial reform, and other country –specific factors, and the relationships among the development of the various parts of a financial system. It is clear from the previous studies that financial markets tend to develop as the economy grows and financial reform progresses. Stock market development is embodied in the general financial sector development. In other words, stock market complements the development of other parts of the financial system. For example Singh (1997) find positive relationship between economic growth and stock market development and a large number of empirical studies on the role of FDI in host countries suggest that FDI is an important source of capital, complements domestic private investment, is usually associated with new job opportunities and enhancement of technology transfer, and

boosts overall economic growth in host countries. We therefore observe triangular causal relationship: (1) FDI stimulates economic growth (2) economic growth promotes stock market development; and (3) implication that FDI promote stock market development. In a related study, Errunza (1983) found that foreign capital inflows have long term impact on stock market development and increase investor participation. Yartey (2008) argues that foreign investment is associated with institutional and regulatory reform, adequate disclosure and listing requirements and fair trading practices which inspire increase inspire greater confidence in domestic markets. This increases the investor's base and participation and leads to more capital flows.

3. Ghana Stock Exchange

The idea of establishing a stock exchange in Ghana dates back to 1968 and subsequent promulgation of the Stock Market Act of 1971, which laid the foundation for the establishment of the Accra Stock Market Limited (ASML) in 1971. Unfavourable macroeconomic environment, political instability and lack of government support undermined the take off of Accra Stock Market Limited (ASML) remained a mirage. In spite of these early set backs, two stock brokerage firms, namely National Trust Holding Company Ltd (NTHC) and National Stockbrokers Ltd, now Merban Stockbrokers Prior to the establishment of the Ghana Stock Exchange in November 1990, did over-the-counter (OTC) trading in shares of some foreign-owned companies.

Under the supervision of the IMF and World Bank, Ghana underwent structural reforms in 1983 to remove distortions in the economy together with other financial reforms including but not limited to deregulation of interest rates, removal of credit controls, and floating of exchange rates. After the financial liberalization and the divestiture of a host of state owned enterprise the need for stock market in Ghana became unavoidable.

The Ghana Stock Exchange was incorporated in July 1989 as a private company under the Ghana companies' code, 1963(Act179). However, the status of the company was changed to a public company under the company's Code in April 1994.The exchange was given recognition as an authorized stock exchange under the stock Exchange Act of 1971.Trading on the floor of the exchange commenced on November 12, 1990. The number of listed companies increased to 13 in 1991; 19 in 1995 and currently stands at 32 (GSE Quarterly Report, June 2007). The increase in the number of listings has also reflected in market capitalization. The Ghana stock market was voted sixth and best performing emerging market in 1993 and 1994 respectively. The GSE capital appreciated by 116% in 1993 and gained 124.3% in its index level in 1994 (GSE quarterly bulletin, March 1995). This follows the listing of Ashanti Goldfields Company (AGC) now Anglogold Ashanti. The listing of AGC changed the face of the Ghana stock Exchange and attracted many foreign in investors. In 1995, the index grew 6.3%, this abysmal performance is partly attribute to high inflation and interest rate. At the end of 2004, market capitalization stood at US$ 2,644 million. Annual turnover ratio just remains about 3.2% in 2004, from an all-time high of 6.5% in 1998. As of October 2006 the market capitalization of the Ghana Stock Exchange was about $11.5billion. The Ghana Stock Exchange (GSE) holds trading every working day. All trading are carried on the floor of exchange except Ashanti Gold shares which can be traded both (i) through the

GSE and (ii) over-the-counter after GSE trading hours, but all such trades must be subsequently reported to the GSE at the next trading session. The main indices are the GSE All Share index and the Databank stock index (DSI). Three new indices comprising the SAS index (SASI), SAS Manufacturing index (SAS-MI) and the SAS Financial index (SAS-FI) have also been published Strategic African Securities Limited.

4. Performance of FDI inflow in Ghana

Attracting FDI is preoccupation of Ghana's 'opening up' policies and economic Reforms. A successive government in Ghana has developed various new legislations to improve investment conditions and the business environment in order to attract FDI and has been a top ten reformer globally for the second year in a row, according to the World Bank's Doing Business team. Ghana's shares of FDI quadruple from 2005 to $636M in 2006 and represent 19.4% of gross fixed capital formation according to 2008 World Investment Report (WIR). Ghana currently ranked 76th in inward FDI performance index. Foreign Direct investment play important role in the project finance plan in Ghana. According to (GIPC, Jan. 2007), foreign equity accounted for about 75% of overall equity finance in Ghana. Table 1 shows year –on-year project finance plan and FDI inflow in Ghana.

Table 1: FINANCE PLAN OF PROJECTS (US$'M)

Financing Plan	Cumulative Jan 2001-Dec2006	%	Jan-Dec 2006	%	2005	%	2002	%	Sept 1994-Dec 200	%
EQUITY										
Local	86.37	2.8%	16.89	0.7%	7.55	3.7%	3.04	4.7%	199.57	12%
Foreign	2,046.71	67.4%	1782.70	75.3%	107.77	53.4%	19.49	29.9%	409.36	25.4%
Total Equity	**2,133.09**	**70.2%**	**1799.59**	**76.0%**	**115.32**	**57.1%**	**22.53**	**34.6%**	**608.93**	**37.9**
LOAN										
Local	97.29	3.2%	33.5	1.4%	38.65	19.1%	3.17	4.9%	88.58	5.5%
Foreign	806.52	26.6%	534.76	22.6%	47.97	33.8%	39.44	60.5%	911.00	56.6%
Total Loan	**903.81**	**29.8%**	**568.26**	**24.0%**	**86.63**	**42.9%**	**42.61**	**65.4%**	**999.59**	**62.1%**
Grand TOTAL	**3,036.90**	**100%**	**2367.85**	**100%**	**201.95**	**100%**	**65.14**	**100%**	**1608.52**	**100%**
FDI INFLOW										
Foreign Equity	2,046.72	71.7%	1782.70	75.3%	107.77	53.4%	19.49	29.9	409.36	25%
Foreign Loan	806.52	28.3%	534.76	22.6%	47.97	23.8%	39.44	60.5%	911.00	56.6%
Total	**2853.24**	**94.0%**	**2317.46**	**97.9%**	**155.75**	**77.1%**	**58.93**	**90.5%**	**1320.36**	**82.1%**
LOCAL PARTICIPATION IN INVESTMENT										
Local Equity	86.37	2.8%	16.89	0.7	7.55	3.7%	3.04	4.7%	199.57	12.4%
Local Loan	97.29	3.2%	33.5	1.4	38.65	19.1%	3.17	4.9%	88.58	5.5%
Total	**183.66**	**6.0%**	**50.39**	**2.1**	**46.20**	**22.9%**	**6.21**	**9.5%**	**288.16**	**17.9%**

Source: GIPC Quarterly Report (January, 2007)

5. Data and Methodology

(I) The Data

The main aim of this paper is to examine the impact of Foreign Direct investment on stock market development in Ghana. The Variables use in this study include market capitalization as a proportion of GDP, Stock traded as a proportion of GDP, Ghana Cedi-Dollar exchange rate and Net FDI inflow. The logic behind the inclusion of relevant variables is discussed below.

Stock Market Development

We measure stock market development by market capitalization as a proportion of GDP. Market capitalization as a proportion of GDP measure equals the total market value of listed shares divided by GDP

The assumption behind this measure is that it is less arbitrary than any other measure of stock market development. The annual data was obtained from IMF- World Bank World Economic indicators, April 2008 and interpolated into quarterly data by method proposed by Goldstein and Khan (1976).

Exchange Rate

Macroeconomic stability may be an important factor for the development of the stock market and FDI attraction. The more stable the macro economy the more incentive firms and foreign investors have to participate in the stock market. We therefore expect stable macroeconomic environment to enhance stock market development and attract more foreign investors. We use Ghana Cedi-Dollar exchange rate as measure of macroeconomic stability because of importance of currency risk to foreign investors. Also the dollar is the most foreign traded currency in Ghana. The quarterly data was extracted from IMF International Financial statistics (IFS), September 2008 Database

Net Foreign Direct Investment (FDI) Inflow

According to Balance of Payments Manual: Fifth Edition (BPM5) (International Monetary Fund, 1993) FDI refers to an investment made to acquire lasting interest in enterprises operating outside of the economy of the investor. The net FDI use in this study is the difference between inward and outward FDI in million US dollars (Inward FDI-outward FDI). The net FDI best represent the country's share of the FDI inflow. The annual Net FDI data were extracted from UNCTAD FDI online: www.unctad.org (UNCTAD 2008)

(II) Methodology

The principal methods employed to analyse the time series behaviour of the data involves cointegration together with two short-run analyses: impulse response function and variance decomposition from the estimation of a VECM. The Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) approaches are used to pre-test the order of integration for

all time series variables1. The model lag length selection was determined by both Schwarz (SIC) and Akaike (AIC) Information Criterion. Lagrange Multiplier tests are run to ensure that the residuals from the chosen lag length are serially uncorrelated

Cointegration technique introduced by Granger (1981) and developed by Engle and Granger (1987) has become useful framework for analyzing long-run relationships amongst series, which overcomes the problem of non-stationarity and allows the investigation into both the levels and first differences of series.

In the current study, we apply the multivariate cointegration analysis of Johansen (1988, 1991) and generalized impulse response function (GIRF) from Vector Error Correction Model (VECM) to investigate the linkages between FDI and stock market development in Ghana.

The Johansen maximum likelihood procedure provides a unified framework for the estimation of multivariate cointegrating systems based on the error correction mechanism of the VAR(k) model with Gaussian errors .Define X_t as a set of I (1) variables consisting of n variables. An error correction model of VAR (k) model, can be expressed as

$$\Delta X_t = \varphi + \sum_{i=1}^{k-1} \Gamma_i X_{t-1} + \Pi X_{t-k} + \varepsilon_t \qquad (1)$$

where Δ is the first difference operator, Γ_i is an coefficient matrix, defined as $\Gamma_i = -(\mathrm{I} - A_1 ... - A_i)$, which represents the short-run dynamics, and Π is an n×n matrix defined as $\Pi = -(\mathrm{I} - A_1 ... - A_i)$, where I is an identity matrix, whose rank determines the number of distinct cointegrating vectors. If Π has rank r, then there are r cointegrating relationships between the X_t or n-r common stochastic trends. The number of cointegrating vectors reveals the extent of long-run relationship. If n-r=0 (r=0) (full rank), there is no stochastic trends, with all elements in X_t being stationary [I (0)]. Cointegration is not defined in such cases If n-r=n(r=0) there are no stationary long-run relationships among the elements of X_t. Reduced rank (i.e. n>n-r>0) implies the existence of at least one common stochastic trend, and there will then exist n×r matrices α and β such that Π=αβ'. The β matrix gives the cointegrating vectors, while α gives the amount of each cointegrating vector entering each equation of the VECM, also known as the adjustment matrix.

Johansen developed two likelihood ratio tests for testing the number of cointegration vectors (*r*): the trace test given by

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^{g} \ln(1 - \lambda_i) \qquad (2)$$

;and

Maximum eigenvalue test statistics represented as

$$\lambda_{\max}(r, r+1) = -T \ln(1 - \lambda_{i+1}. \qquad (3)$$

The trace statistics tests the null hypothesis of no cointegration (i.e. r=0) against the alternative that there is at least one cointegration vector (i.e. $r > 0$).. The maximum Eigenvalue statistics test the null hypothesis that the number of cointegrating vectors is r against the specific alternative of $r + 1$ cointegrating vectors

(III) Empirical Result

Unit Root

Cointegration requires that all the variables are stationary and be integrated of the order. To ensure that the variables are stationary and that shocks are only temporary and will dissipate and revert to their long-run mean, we test for tests for stationarity or unit roots. Augmented Dickey-Fuller (ADF) and Phillips-Peron (PP) test are performed on the variables in levels and first differences. The results of the unit root reported in table 1 indicate that all our variables are integrated of order I (1).

Table 1: Unit Root Test (ADF Test and PP Test)

	ADF Test		PP Test	
	Levels	1st Difference	Levels	1st Difference
LMC	-1.498228	-3.030977**	-2.889456	-15.82579**
LFDI	-1.769952	-3.292708**	-3.366459	-1.988769**
LXR	-1.769952	-3.292708**	-1.836850	-3.366459**

LMC= log (MC/GDP), LFDI=log (FDI) and LXR=log (XR)

Cointegration Estimation

Having established that the variables are I (1), we proceed to estimate cointegration. VAR lag length 6 is used in the estimation. This is selected with Akaike information criterion (AIC) and the Schwartz Bayesian criterion (SBC). Both trace test and maximum eigenevalue test are presented in table 2. Evidence from Table 2 indicates rejection of the null hypothesis of no cointegration for both tests. This implies that there is long- run relationship among the variable. Table 3 shows the normalized cointegration coefficients (normalized on LMC). The normalized cointegration indicates statistically significant positive relation between FDI and stock market development in Ghana.

Table 2: Multivariate Cointegration Test

Trend assumption	Test	Lag	$r = 0$	$r \leq 1$	$r \leq 2$
Linear deterministic trend	λ_{trace}	6	30.95**[0.04]	7.67 [0.50]	0.97 [0.32]
	$\lambda_{\max}$	6	23.29**[0.02]	6.67 [0.53]	0.97 [0.32]

Note: The null hypothesis for these two tests here is that the data generating processes under consideration are not cointegrated. Values in the [ ] are probability of the test. Critical values for both trace and maximum-eigenvalue statistics at the 5% level are given by MacKinnon-Haugh-Michelis (1999). ** denotes the rejection of the hypothesis at the 5% level

Table 3: Normalized cointegrating coefficients

LMC	LFDI	LXR
1.000000	-1.505557	0.502588
	[-2.20935]	[4.64820]

Note: Test statistics in parentheses

Impulse Response Function (IRF) and Variance Decomposition (VDC)

The presence of at least one cointegration implies that VECM can be estimated. IRF and VDC base on the VECM are examined. We apply the generalized impulse response function (GIRF) for this study;

$$GIRF(n, \varepsilon_{t,} \omega_{t-1}) = E[X_{t+n} / \varepsilon_{j,t,} \omega_{t-1}] - E[X_{t+n} / \omega_{t-1}] \quad (4)$$

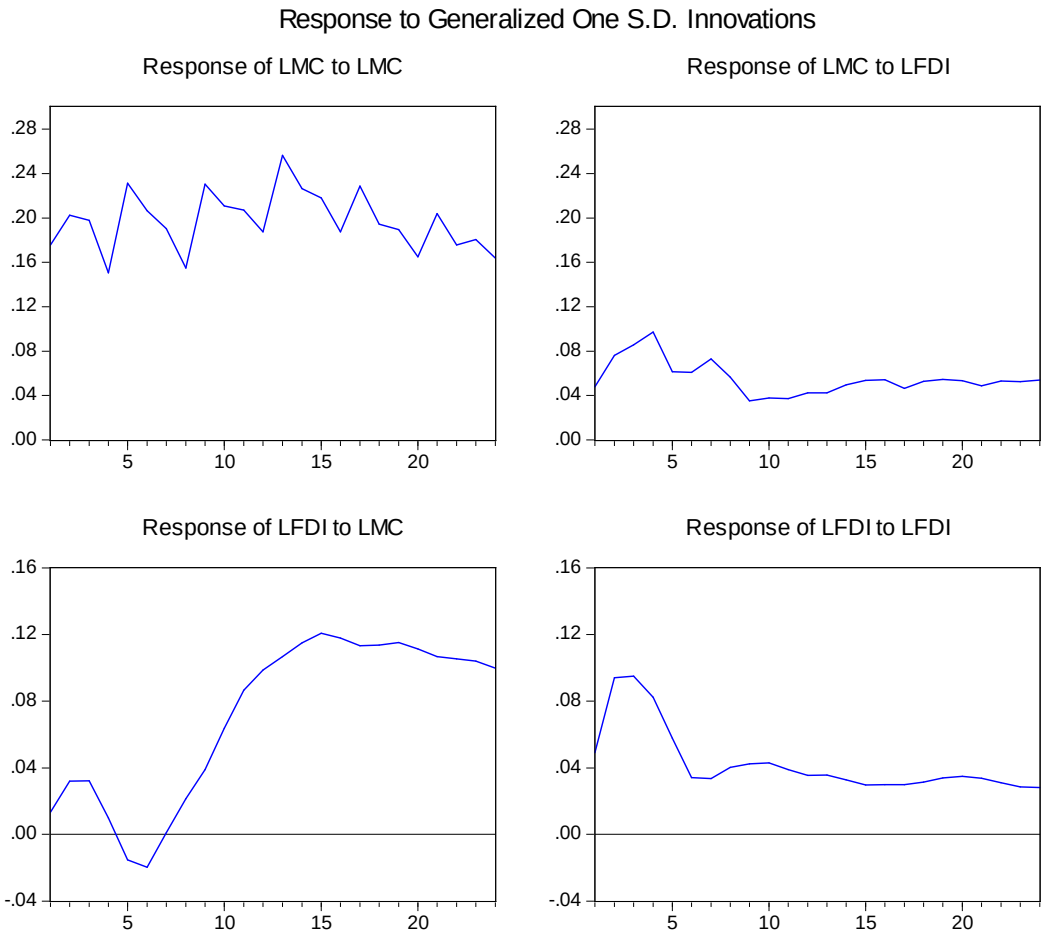
Following Pesaran and Shin (1997) by constructing orthogonal sets of innovations that do not depend on the VAR ordering, we derive GIRF from an innovation to the jth variable by applying a variable specific Cholesky factor computed with the variable at the top of the Cholesky ordering. Figure 2 provides IRF for the variables analysed in the study. Variation in the FDI has positive impact on LMC.

The results of the variance decomposition analysis are reported in Table 4.
The reported figures indicate the percentage of variation in each variable that can be attributed to its own shock and the shocks to the other variables in the system. These are provided for six different lagged time horizons: one quarter, four quarters, 8 quarters 20 quarters and 24 quarters.

Table 4: **Variance Decomposition (VDC) of LMC Due to**

Lag(n)	LMC_{t-n}	$LFDI_{t-n}$	LXR_{t-n}
1	88.04687	3.104864	8.848264
4	81.17162	16.39689	2.431483
8	85.75524	12.68994	1.554821
16	91.06977	8.125751	0.804475
20	91.40626	7.924947	0.668791
24	91.46258	7.931919	0.605501
Cholesky Ordering: LXR LFDI LMC			

Figure 2: Generalized Impulse Function



6. Conclusion

The study examined the impact of FDI on stock market development in Ghana proxy by market capitalization as a proportion of GDP. The study used quarterly data from fist quarter of 1991 to fourth quarter of 2006. The cointegration analysis reveals existence of long-run relationship between FDI and stock market development. Contrary to previous researchers who found FDI to be negatively effect growth in Ghana, we find significant positive impact on stock market development in Ghana. The concentration of FDI in the mining sector which does not generate direct growth impacts on the wider economy has been cited as the reason for negative effect of FDI on economic growth. The Market benefited from the listing of Ashanti Goldfields (now Anglodold Ashanti) which accounts for about 50 per cent of the total market capitalizations and its exclusion from the non-resident investors restriction which allowed a single investor (i.e. one who is not a Ghanaian and who lives outside the country) to hold up to 10 percent and no more than cumulative total of 74% of every equity. One important thing worth pointing stock market development play major role in attracting FDI (see Impulse response in Figure 2). Our results have several policy implications. First, we support the policy maker's

decision to slash the non-resident investors for listed companies. This will attract major investors to other sectors of the economic to bring need growth in the exchange market and the economy as whole. Second, policy makers should devise strategies to increase the FDI stock (retain FDI) and offer incentive for long investing and listing on the stock market.

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