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Abstract

Using multivariate cointegration and error correction model, this paper examines the impact of Foreign Direct Investment (FDI) on the stock market development in Ghana. Our results indicate that there exists a long-run relationship between FDI, nominal exchange rate and stock market development in Ghana. We find that a shock to FDI significantly influence the development of stock market in Ghana.

JEL classification codes: C50, F20, G20
Key words: Stock Market Development, Foreign Direct Investment, Market Capitalization

1. Introduction

Foreign Direct Investment (FDI) in developing economies has grown rapidly following financial and political transformations. To increase their share of FDI flows, most of the countries ease restrictions on foreign direct investment, strengthened macro stability, privatization of state-owned enterprises, domestic financial reforms, capital account liberalization, tax incentives and subsidies 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 their 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 the extent of their impact on emerging stock market development of developing countries has receive little attention.

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 greater confidence in domestic markets. This increases the investor's base and participation which leads to more capital flows.

The purpose of this paper is to examine the impact of Net FDI inflow on stock market development in Ghana. We follow Garcia and Liu (1999) and proxy stock market development by market capitalization as percentage of GDP. Using multivariate cointegration test, we find a long –run relationship among FDI, Ghana cedi –U.S. dollar exchange rate (XR), market capitalization as percentage of GDP (MC). The impulse responses function and variance decomposition from the Vector Error Correction Model (VECM) indicate a short-run positive relationship between FDI and stock market development.

The rest of the paper is structured as follows. Section 2 provides brief history of stock market development in Ghana. Section 3 provides trends in FDI flow in Ghana. Section 4 provides data and methodology and conclusion in section 5.

2. 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 the ASML. In spite of these early setbacks, two stock brokerage firms, the National Trust Holding Company Ltd (NTHC) and the 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 (Act 179). 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 and commenced trading on the floor of the exchange on November 12, 1990. The number of listed companies increased to 13 in 1991; 19 in 1995 and to 32 in 2007 (GSE, 2007). 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, March 1995). This followed the listing of Ashanti Goldfields Company (AGC) now Anglogold Ashanti. The listing of AGC changed the face of the GSE and attracted many foreign investors. The market's abysmal 6.3% growth rate in 1995 was partly attributed to high inflation and interest rate. The increase in the number of listings has also reflected in market capitalization which increased from a little over US$ 2.6 million 2004 to about $11.5billion. At the same time, the annual turnover ratio remained just about 3.2% in 2004, from an all-time high of 6.5% in 1998. The GSE holds trading every working day. All trading are agreed on the floor of exchange except Ashanti Gold shares which can be traded both through the GSE and over-the-counter after GSE trading hours. All out of hours trades are 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 by Strategic African Securities Limited.

3. Trends in FDI inflow in Ghana

Attracting FDI is preoccupation of Ghana's 'opening up' policies and economic Reforms. The successive governments 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 quadrupled from 2005 to $636M in 2006 and represent 19.4% of gross fixed capital formation according to 2008 World Investment Report (WIR). Ghana currently ranks 76th in inward FDI performance index. Foreign Direct investment plays an 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				**Cumulative**					
Plan	Jan 2001- Dec 2006	%	Jan-Dec 2006	%	2005	%	2002	%	Sep 1994-Dec 2000	%
					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)

4. Data and Methodology

4.1. The Data

As the aim of this paper is to examine the impact of foreign direct investment on stock market development in Ghana, we make use of market capitalization as a proportion of GDP, Ghana cedi-Dollar exchange rate and Net FDI inflow. The logic behind the inclusion of the variables and their sources is discussed below.

4.1.1. Stock Market Development

We measure stock market development by market capitalization as a proportion of GDP. This 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 (Demirguc-Kunt and Levine, 1996). The annual data was obtained from IMF- World Bank World Economic Indicators, April 2008 and interpolated into quarterly data by the method proposed by Goldstein and Khan (1976).

4.1.2. Nominal 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 incentivizing firms become, and the more foreign investors participate in the stock market. We therefore expect stable macroeconomic environment to boost stock market development and attract more foreign investors. Due to the importance of currency risk to foreign investors we use Ghana cedi-U.S. dollar exchange rate as measure of macroeconomic stability. 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.

4.1.3. Net Foreign Direct Investment (FDI) Inflow

The Balance of Payments Manual (BPM5) published by the International Monetary Fund in 1993 defines FDI as an investment made to acquire lasting interest in enterprises operating outside of the economy of the investor. The net FDI used in this study is the difference between inward and outward FDI in million U.S. dollars. The net FDI best represents the country's share of the FDI inflow. The annual Net FDI data were extracted from the United Nations Conference on Trade and Development (UNCTAD, 2008).

4.2. Methodology

The principal methods employed to analyse the time series behaviour of the data involves cointegration together with two short-run analyses including impulse response function and variance decomposition from a VECM. Cointegration technique introduced by Granger (1981) and developed by Engle and Granger (1987) has become a 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. Defining 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

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

where Δ is the first difference operator, Γ_i is an coefficient matrix, defined as $\Gamma_i = -(-A_1 .... - A_i)$, which represents the short-run dynamics, and Π is an $n \times n$ matrix defined as $\Pi = -(I - A_1 .... - A_i)$, 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 X_t or $n-r$ common stochastic trends. The number of cointegrating vectors reveals the extent of the long-run relationship. If $n-r=0$ (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 $n-r=n$ 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 $n \times r$ matrices α and β such that $\Pi = \alpha\beta'$. 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. We employ the two likelihood ratio tests developed by Johansen for testing the number of cointegration vectors (r). The trace test given below tests the null hypothesis of $r=0$ against the alternative of at least one cointegrating vector ($r > 0$):

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

The maximum eigenvalue test presented below also tests the null hypothesis of r cointegrating vectors against the alternative of $r+1$ number of cointegrating vectors.

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

5. Empirical Results and Discussion

5.1. Unit Root

Since the cointegration methodology requires that the variables should be integrated of the same order, we test for unit roots by using the Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) approaches. These tests are performed on the variables in levels and first differences. The results of the unit root tests reported in Table 1 indicate that all our variables are integrated of order 1, meaning that any shocks to the variables are only temporary. As well, if this stochastic trend is common among the variables, the said shock will dissipate so that they revert to their long-run mean.

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**

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

5.2. Cointegration Estimation

Having established that the variables are integrated of the same order, we proceed to test for 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 implying that there is long run relationship among the variables. Table 3 displays the coefficients of the variables when normalized on LMC. The results indicate a statistically significant positive relation between FDI and stock market development in Ghana, such that, a percentage increase in FDI can lead to a 1.5 percent rise in market capitalization in the long run.

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 of the above two tests is that the data generating processes under consideration are not cointegrated. Values in [ ] 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

5.3. Impulse Response Function and Variance Decomposition

Since there is evidence of at least one cointegration among the variables, we follow the impulse response functions and variance decomposition under estimate the error correction model to analyse the short run interactions of the variables under consideration. Following Pesaran and Shin (1997), we apply the generalized impulse response function (GIRF) shown below for this study;

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

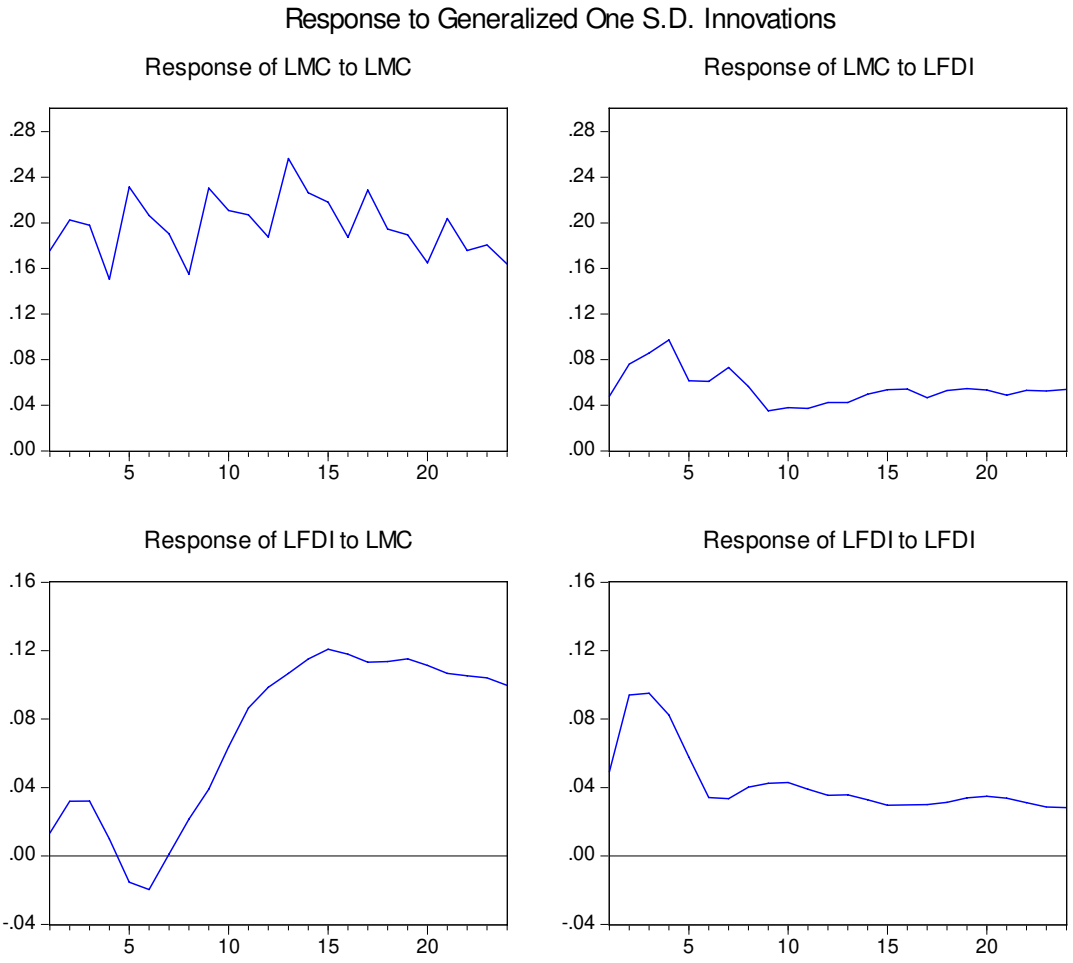
In this case, the orthogonal sets of innovations do not depend on the VAR ordering, and the GIRF is derived from an innovation to the jth variable by applying a variable specific Cholesky factor computed with the variable at the top of the Cholesky ordering. The variance decomposition analysis will enable us to determine the proportion of MC accounted for by its own shocks and the shocks to the other variables. Figure 2 provides the IRF for the variables analysed in the study. Variation in the FDI has positive impact on MC.

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. The results show that FDI accounts for at most 16 percent of the variation of MC within 8-steps ahead. Up to 24-steps MC shocks explain well over 91 percent of its variations, indicating that although there is a long run relationship between the variables, none of the variables has the power to predict MC.

Table 4: Variance Decomposition 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 Response Function



6. Conclusion

The study has used quarterly data from 1991:1 to 2006:4 to examine the impact of FDI on stock market development in Ghana. The cointegration analysis reveals the existence of long-run relationship between FDI, nominal exchange rate and stock market development. Contrary to previous researchers who find FDI to negatively affect 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 AngloGold 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 is stock market development play major role in attracting FDI (see Impulse response in Figure 2). This opens avenue for feature research into prospect of attracting FDI through stock market development. Our results have several policy implications. First, it supports the policy maker's decision to slash restriction for the non-resident investors for listed companies. This will attract major investors to other sectors of the economy to bring the needed growth in the exchange market and the economy as a whole. Second, policy makers should devise strategies to increase the FDI stock (retain FDI) and offer incentives for long investing and listing on the stock market.

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