

AFRICAN STOCK MARKET DEVELOPMENTS AND ECONOMIC GROWTH

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ABSTRACT

Stock market development has been fundamental to the domestic financial liberalization programs of most emerging markets. Recently, it has also become a major channel of foreign capital flows to emerging economies. Using a panel data set, this study investigates the relationships between the stock market development and economic growth in five African countries (Ghana, Cote d'Ivoire, Nigeria, South Africa and Mauritius). The results show that in the long run, the growth of the stock market size is not related to GDP growth. However, in the short run, the growth of the stock market seems to stoke improvement in liquidity and income growth. Our results partially support previous empirical studies. In terms of government policy, an increase in market capitalization and income level, and a favorable exchange rate can be used to drive economic growth in the short run. In the long run, economic growth can be achieved by growing the income level, increasing the value of stocks traded, and encouraging more companies to list on the stock exchanges.

Keywords: Africa, Economic Growth, Stock Markets

INTRODUCTION

The stock market is an important source of financing in emerging economies. World Bank (2005) reports that stock market development has been fundamental to the domestic financial liberalization programs in most emerging markets. Additionally, the stock market has become a major channel of foreign capital flows to emerging economies in recent years.

Conceptual theory indicates that stock market development might enhance economic growth. Such reasoning has been buttressed by empirical evidence. Levine and Zervos (1996) show that stock market development plays a pivotal role in sowing future economic growth. Though there are enormous advantages in sourcing funds from the stock markets for business development, it appears that most African countries are not taking full advantage of it.

The large amount of academic and policy interests over the last decade in promoting stock market development in African countries raises a number of interesting questions. For instance, what benefits does a country gain from having a stock market? What is the relationship between stock market development and economic growth? This study seeks to add to the extant literature on the subject by performing an in-depth analysis of the effect of stock market on economic growth in five African countries.

In view of the diversity of Africa in terms of economic and political situations, this study focuses on Ghana, Cote d'Ivoire, Nigeria, Mauritius and South Africa. These five countries are at various

stages of economic development but compared with their neighbors in general, they tend to be better developed financially with a functioning banking sector. After all, stock market indicators are closely related to the banking sector development as well (see Demirguc-Kunt & Levine, 1996). Our focus on these countries is also dictated by data availability and their quality.

Ghana's economy has been strengthened by a quarter century of relatively sound management, a competitive business environment, and relatively stable political landscape. But in recent years it has suffered the consequences of loose fiscal policy, high budget and current account deficits, and a depreciating currency. Ghana has a market-based economy with relatively few policy barriers to trade and investments in comparison with other countries in the region.

After the end of its long (over 10 years) civil conflict in 2011, Cote d'Ivoire has experienced a surge in foreign investments and economic growth. In June 2012, the IMF and the World Bank announced US\$4.4 billion in debt relief for the country under the Highly Indebted Countries (HIPC) Initiative. For the last 5 years the country's growth rate has been among the highest in the world.

South Africa is selected for this study based on an array of political and economic indicators. South Africa is a middle-income emerging market with an abundant supply of natural resources. The country has a well-developed financial, legal, communications, energy and transport sectors and the largest stock market in Africa, which ranks among the top 20 in the world. However, the economic growth of South Africa has decelerated in recent years to about 0.3% in 2016. The country's economic policy has focused on controlling inflation. Political infightings within the country's ruling party and the volatility of the country's currency, Rand, adversely affected the country's economic growth.

Nigeria is one of the largest economies in the Sub Saharan Africa and relies heavily on oil export as its main source of foreign exchange earnings and government revenues. Since the 2007-2009 global financial crisis, Nigeria's economy has been driven by growth in agriculture, telecommunications, and services. Regulatory constraints and security risks have hampered new investment in oil and the sector contracted every year since 2012. In part due to lower oil prices on the international market, Nigeria entered economic recession in 2016 (see www.cia.gov).

Since its independence, Mauritius has undergone a remarkable economic transformation from being a low income, agriculturally based economy to become a diversified, upper middle income economy with growing industrial, financial and tourism sectors. Mauritius' sound economic policies and banking practices helped mitigate the negative effect of the global financial crisis in 2007-2009. GDP has grown in the 3% to 4% range between 2010 and 2016. The country continues to rank first in sub-Saharan Africa on the World Bank's Doing Business Report.

THE STOCK MARKETS

The Ghana Stock Exchange (GSE) was inaugurated in 1989. Since the inauguration, its listings have been included in the main index, the GSE All-Share Index. In terms of performance, the GSE ranked in 1993 as the 6th best performing emerging stock market, with a market return of 116%. In the following year, 1994, it became the top performing stock market among all emerging

markets with a return of 124.3%. Partly because of high inflation and interest rates, its stock market return went down to 6.3% in 1995. As of December 2006 the market capitalization of the Ghana Stock Exchange was about US\$760 million. By December 31, 2011, the market capitalization had risen to US\$3.9 billion. It currently lists 42 equities from 37 companies and 2 corporate bonds.

Unlike other countries in Africa that have their own stock exchange, Cote d'Ivoire shares the only regional exchange, BRVM (headquartered in Ivory Coast), in Africa with seven other French speaking West African countries within the West African Economic and Monetary Union (WAEMU). These countries are Benin, Burkina Faso, Guinea Bissau, Mali, Niger, Senegal and Togo. BRVM was opened in 1998 and has a branch in each WAEMU country. Although the exchange is majority owned by the private sectors, the member states collectively own 13.4% of the capital. Trading on the BVRM is computerized with satellite links. Brokers and agents can transmit orders and edit quotation results to the central site in Abidjan while they are sitting at workstations in their desks located in national branch offices. Trades are cleared and settled at the Depositaire Central/Banque de Reglement SA. BRVM is dominated by Ivorian companies. For the purpose of this paper, the exchange is considered wholly owned by Cote d'Ivoire.

South Africa's stock market, Johannesburg Stock Exchange (JSE), is the oldest and largest stock exchange in Africa. JSE is currently ranked as the 19th largest stock exchange in the world by market capitalization. A number of heavyweights such as British American Tobacco, SABMiller, BHP Billiton and GlencoreXstrata account for a large share of the market. There are almost 400 companies listed on the Main Board and the alternative market, AltX. A number of initiatives were introduced in the late 1990s to improve the efficiency of the exchange. The first major change occurred in November 1995, when the Stock Exchanges Control Act changed the ways in which stocks were traded in South Africa, opening the door of trading to non-South Africans, and allowing brokers to buy and sell stocks for their own accounts. The trading system is now automated through an electronic clearing and settlement system.

The Nigerian Stock Exchange (NSE) was established in 1960. In terms of market capitalization, it is ranked as the 3rd largest stock exchange in Africa. It has 176 listed companies and all listings are included in the Nigerian Stock Exchange All Shares index.

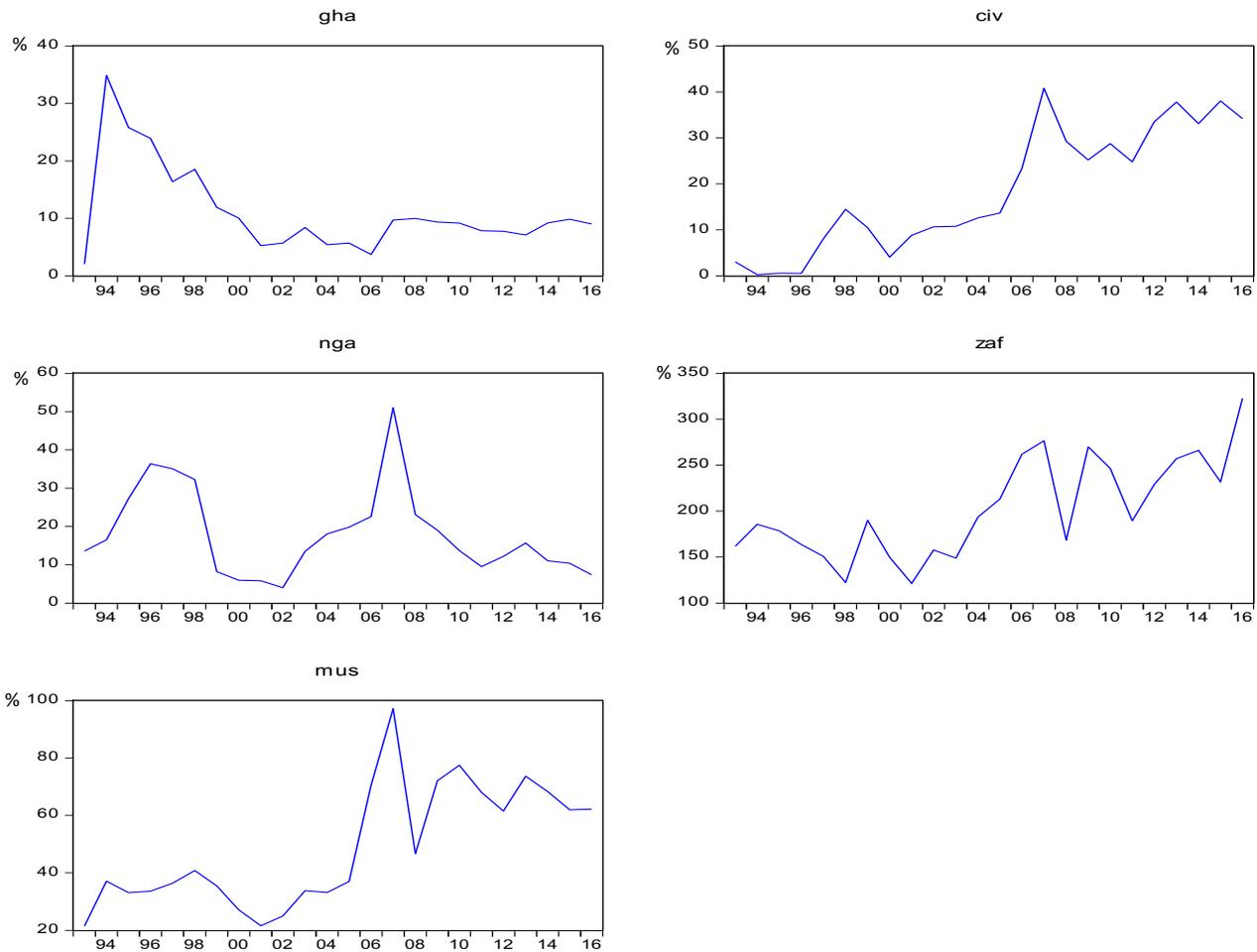
The Stock Exchange of Mauritius (SEM) was incorporated in 1989. SEM initially started its operation with only five listed companies and a market capitalization of merely US\$92 million. The size of the market has grown from a market capitalization to nominal GDP ratio of less than 4% in 1989 to a current market to nominal GDP ratio exceeding 100% in an economy that has witnessed a 4% average growth rate during the last 25 years.

Growth Pattern of Market Capitalization

These five Africa countries have demonstrated diverse experiences in terms of market capitalization as a percentage of economic growth during the period under consideration, as shown in Figure 1 below. This can be explained partly by the different degree of financial reforms in these countries. The market capitalization to nominal GDP ratio of the countries - Ghana, Cote d'Ivoire, Nigeria, South Africa and Mauritius peaked in 1994, 2007, 2007, 2016, and 2017 respectively. The ratios in Cote d'Ivoire, Nigeria and Mauritius have shown inconsistent growth trend before

and after their respective peaks. On the other hand, the ratio in Ghana has been declining throughout the period after its peak in 1994. To the contrary, South Africa has witnessed an upward trend in the ratio in recent years. It is noteworthy that, with the exception of Ghana, all the selected countries registered a significant decline in market capitalization to nominal GDP ratio in 2008 owing probably to the global financial crisis.

Figure 1. Market Capitalization as Percentage of Nominal GDP per Year



Source: World Development Indicators and Authors

LITERATURE REVIEW

There are numerous studies examining the nexus between financial development and economic growth. One of the popular theories is the bi-directional hypothesis. Proponents of this hypothesis assert that there is a two way relationship between financial development and economic growth. As such, financial market development follows economic growth which in turn serves as a catalyst for the growth in financial market. This hypothesis is supported by Khalifa Al-Yousif (2002) using time series and panel data from 30 developing countries. He examines the causal relationship

between financial development and economic growth and finds that the relationship between financial development and economic growth is bi-directional.

The bi-directional hypothesis is also confirmed by Akinlo & Egbetunde (2010). They study the long run causal relationship between financial development and economic growth for 10 countries in Sub Saharan Africa. The authors find that financial development is cointegrated with economic growth in many of the countries. Out of the 10 sample countries, a bi-directional relationship between financial development and economic growth existed in six of the countries – Kenya, Chad, South Africa, Sierra Leone and Swaziland. Other studies have likewise noted this type of feedback effect (see also Liuntel & Khan , 1999).

On the contrary, Oya and Domar (2006) contend that there is no causal relationship between financial development indicators and economic growth. They posit that the discernable relationship between financial market development and economic growth are merely results of historical idiosyncrasies. They further argue that financial market development should follow economic growth, which means that financial market development is demand driven. However, Tamimi et al. (2001) find no clear evidence that financial market development is affected by economic growth.

This Demand-Following hypothesis is used by Onwumere et al. (2012) to test the relationship between stock market development and economic growth in Nigeria. According to the hypothesis, the growth of the economy causes increased demand for financial services which, in turn, leads to the development of financial markets. Using time series data, they demonstrate that economic growth has positive but non-significant impact on market capitalization ratio and turnover ratio of the Nigerian stock exchange but has a negative impact on the Nigeria stock market value traded ratio.

Calderon-Rossell (1990), using annual data from 42 countries during the period 1980–87, shows that stock market liquidity and economic growth are significant determinants of stock market growth. Yartey (2007) modifies Cadeleron-Rossell’s model by adding institutional quality variables such as governance, legal protection, and accountability. His study examines the impact of political risk, law and order, and bureaucratic quality on stock market development using panel data techniques to estimate the regression models. The results show that the variables, especially the economic impact, are positive and significantly linked to stock market development.

Another hypothesis that has been well examined is the “Finance-Led Growth” hypothesis. It is believed that Schumpeter (1911) laid the foundation for this hypothesis. He theorizes that a well-functioning financial system would serve as a catalyst for technological innovations through efficient resource allocation from unproductive sectors to productive sectors. According to Choong et al. (2004), the existence of a well-functioning financial intermediation process channeling scarce resources from surplus units to deficit units provides efficient allocation of resources. As a result, the finance sector should lead other sectors in the growth process. Levine and Zervos (1998) show that the stock market can influence economic growth positively by encouraging savings among individuals and providing equity financing opportunities for firms.

Having reviewed both conceptual theory and the empirical literature, this research posits the following hypotheses:

- Stock market development drives economic growth
- Stock market development determinants are not in fact positively related to economic growth.

METHODOLOGY AND DATA

This study collected secondary data from five African countries. Series considered are nominal GDP, market capitalization to nominal GDP, money supply M2 to nominal GDP, turnover of volume traded ratio, value of stocks traded to nominal GDP, number of listed companies on the stock exchange, per capita GDP, foreign exchange rate, private inflows FDI to nominal GDP representing private capital obtained, exchange rate and inflation. Credit from the bank to private businesses, gross domestic savings to nominal GDP, and broad money (M2) money supply are used as indicators of banking sector development. The time frame spans the years 1993 to 2016. Data were obtained from World Bank Development Indicators.

Singh (1997) asserts that the stock market is expected to accelerate economic growth by boosting domestic savings and increasing the quality and quantity of investments. The stock market is supposed to boost savings by providing individuals with a supplementary financial tool in addition to bank savings.

The majority of studies in the literature employ broad money (M2) as a percentage of nominal GDP to measure financial depth. However, King and Levine (1993) argue that this approach does not tell us whether the liabilities are those of the central bank, commercial banks or other depository institutions. Yartey (2007) contends that while the broad money (M2) is a suitable measure of banking sector development, he supports King and Levine's assertion. Therefore, he uses credit to private firms to estimate banking sector development in his model rather than using the broad money supply. This paper considers bank credit to private firms and gross domestic savings in addition to M2 to assess the effect of the depth of banking sector development on stock market development.

For stock market development to occur, there is a need for a stable macroeconomic environment. Low and predictable rates of inflation are more likely to contribute to stock market development and economic growth. Both domestic and foreign investors are unwilling to invest in the stock market where there are expectations of high inflation. Garcia and Liu (1999) find that sound macroeconomic environment, among other variables, is an important determinant of stock market development in emerging markets. Abimbola and Olusengun (2017) posit that there are high degrees of positive relationship between exchange rate, stock price movement and aggregate output. Based on these studies, this paper considers inflation and exchange rate as indicators of macroeconomic stability and for that matter determinants of stock market development in the selected countries.

We also includes income level as one of the indicators of stock market development because it has been found to be highly correlated with the size of the stock market. Proponents of the demand

driven hypothesis argue that expansion of an economy will create new demand for financial services. We use per capita GDP to measure the income level. To measure private capital flow in this paper, we use foreign direct investment ratio. This is because foreign investors have emerged as major participants in emerging stock markets in the last few decades.

Following the literature, the principal proxy for stock market development is market capitalization as a percentage of nominal GDP. We should also note that different measures of stock market development are highly correlated (Demiguc-Kunt and Levine, 1996).

Other variables of stock market development such as the number of listed companies, changes in the stock market index, turnover ratio of volume of stocks traded, have also been used in the literature. In order to unravel the effect of stock market on economic growth in the five selected countries, this paper also includes economic growth on stock market development indicators and other complementary variables.

Empirical Analysis

The estimation techniques employed for this study are Panel Dynamic OLS and Panel OLS models. The empirical model used to test the effect of stock market development on economic growth is based on Demirguc-Kunt and Levine (1996), Levine and Zervos (1998), Cadeleron-Rossell (1991) and Garcia and Liu (1999).

The baseline model - functional equation under the production function:

$$Y=f(SMD) \tag{1}$$

Estimation of the regression model:

$$Y_{it}=\alpha_i + \beta SMD_{it} + \beta M_{it} + E_{it} \tag{2}$$

Where,

Y_{it} = GDP,

α_i = the unobserved country specific,

E_{it} = residuals

SMD_{it} = a matrix of stock market development variables as follows:

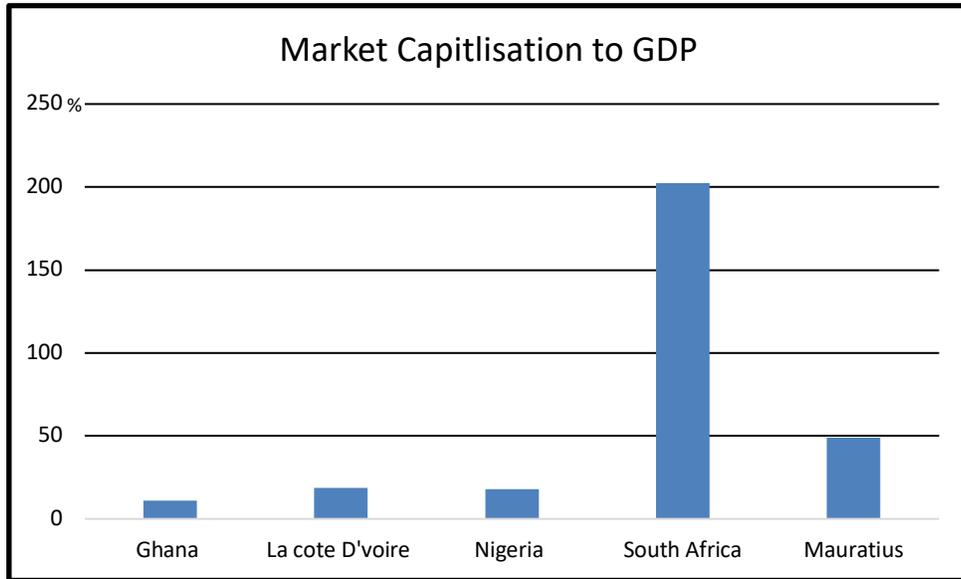
- i. Stock market value traded as a percentage of nominal GDP,
- ii. Turnover ratio of shares traded,
- iii. Number of listed companies on the exchange
- iv. Market capitalization to nominal GDP,

M_{it} = other complementary variables as follow:

- v. per capita GDP
- vi. Bank credit to the private sector as a percentage of nominal GDP,

- vii. Gross domestic savings as a percentage of nominal GDP,
- viii. Private capital flows (FDI) as a percentage of nominal GDP,
- ix. Broad money (M2) as percentage of nominal GDP,
- x. Exchange rate as a barometer of capital mobility
- xi. Inflation rate.

Figure 2. Average Market Capitalization to Nominal GDP (1993-2016)



Source: World Development Indicators and Authors.

Judging from Figure 2 above, South Africa undoubtedly has the most highly developed stock market during the period, whereas Ghana has the least developed stock market sector. More specifically, the average market capitalization to nominal GDP values for the five African countries are as follows:

1. South Africa = 202.4%;
2. Mauritius =48.98%
3. La cote d’Ivoire =18.6%
4. Nigeria=17.99%
5. Ghana = 11.1%

EMPIRICAL METHODS

This study first tested the stationarity of the data series (unit root value). We also applied the cointegration tests to ensure that variables are not cointegrated. In addition, a correlation test was used to ascertain the status of correlation before the final regression tests.

The correlation test indicated that broad money (M2) is highly correlated with bank credit to the private sector (see Appendix 1). So we dropped bank credit to the private sector as a variable in the regression model and used M2 to nominal GDP instead because M2 money supply is broader.

Variables were tested for stationarity at both the ‘level’ and ‘first difference’—summary of various types of unit root test such as Levin, Lin & Chu t*, Breitung t-stat, ADF - Fisher Chi-square, PP - Fisher Chi-square and Im, Pesaran and Shin W-stat are shown in Appendix 2. The tests were performed to identify the possibility of structural breaks within the data set. After taking the first difference of the variables, all variables are confirmed to be stationary.

The cointegration test was carried out (Kao Residual Cointegration Test Method) on all the variables to check if they are co-integrated. The null hypothesis of no co-integration cannot be accepted (see Appendix 3). All the variables have certain long run relationships, hence co-integrated. The number of the variables limited the used of Johansen cointegration test of Pedroni (Engle-Granger based) method.

Having examined the data series with the tests above, this research then applied the Panel OLS regression and Panel Dynamic Least Squares (DOLS) model with 120 annual observations from the five African countries.

Panel OLS Equation

$$\begin{aligned}
 \text{LGDPM} = & 0.798821768281 - 0.0051963091314 * \text{MKCAP2GDP} + 0.0266401331836 * \\
 & \text{STKTRADE2GDP} - 0.00210102649814 * \text{TRNVR} + 0.849851010304 * \text{LCOYSL} - \\
 & 0.0462515492118 * \text{BRDM2GDP} + 0.0425631292706 * \text{INFLWS2GDP} + 1.10206839484 * \\
 & \text{LPERCPTGDP} - 0.0115258968034 * \text{GDS2GDP} + 0.000999272827313 * \text{INFL} - \\
 & 0.013226513288 * \text{LEXCR}
 \end{aligned}$$

Table 1. Long Run Coefficients (OLS) - Dependent Variable is LGDPM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.798822	0.515438	1.549793	0.12410
MKCAP2GDP	-0.0052	0.001837	-2.82864	0.00560
STKTRADE2GDP	0.02664	0.005327	5.000802	0.00000
TRNVR	-0.0021	0.005894	-0.35644	0.72220
LCOYSL	0.849851	0.057838	14.69371	0.00000
BRDM2GDP	-0.04625	0.00279	-16.5793	0.00000
INFLWS2GDP	0.042563	0.018924	2.24914	0.02650
LPERCPTGDP	1.102068	0.080918	13.61952	0.00000

GDS2GDP	-0.01153	0.007669	-1.50287	0.13580
INFL	0.000999	0.003707	0.269532	0.78800
LEXCR	-0.01323	0.02457	-0.53833	0.59140
R-squared	0.925747		Mean dependent var	10.39591
Adjusted R-squared	0.918935		S.D. dependent var	1.500129
Sum squared resid	19.88461			
S.E. of regression				
F-statistic	135.8959			
Prob(F-statistic)	0.000000			

Panel Dynamic OLS Equation

$$\begin{aligned}
 \text{LGDPM}(-1) = & (0.000347)\text{MKCAP2GDP} - (0.00689)\text{STKTRADE2GDP} + (0.000491)\text{TRNVR} - \\
 & (0.011666)\text{LCOYSL} - (0.0001197)\text{BRDM2GDP} + (0.0001717)\text{INFLWS2GDP} + \\
 & (1.07226)\text{LPERCPTGDP} + (7.6327)\text{GDS2GDP} - (0.0006232)\text{INFL} + (0.09573)\text{LEXCR}
 \end{aligned}$$

Table 2. Dependent Variable: LGDPM(-1) Method: Panel Dynamic Least Squares (DOLS)

Panel method: Grouped estimation

Cointegrating equation deterministics: C @TREND

Automatic leads and lags specification (based on SIC criterion, max=*)

Long-run variances (Bartlett kernel, Newey-West fixed bandwidth) used for individual coefficient covariances

Variable	Coefficient	Standard Error	t-statistic	Prob.
MKCAP2GDP	0.00035	0.00008	4.47760	0.00000
STKTRADE2GDP	-0.00690	0.00115	-5.98748	0.00000
TRNVR	0.00049	0.00048	1.02974	0.30550
LCOYSL	-0.01167	0.00466	-2.50218	0.01390
BRDM2GDP	-0.00012	0.00009	-1.32821	0.18700
INFLWS2GDP	0.00017	0.00036	0.48105	0.63150
LPERCPTGDP	1.07227	0.00804	133.42060	0.00000
GDS2GDP	0.00008	0.00036	0.21391	0.83100
INFL	-0.00062	0.00020	-3.05949	0.00280
LEXCR	0.09573	0.00978	9.78474	0.00000
R-Squared	0.575341		Mean dependent var	10.36035

Adjusted R-Sq	0.538942		S.D. dependent var	1.496863
S.E. of regression	1.016389		Durbin-Watson stat	0.002960
Sum squared resid	108.4700			
Long-run variance	1.24E-06			

Analysis of Test Results

The results indicate that, in the short run, the market capitalization to GDP ratio (MKCAP2GDP) is statistically significant and its coefficient is positive. This is consistent with the results from previous studies such as Ikikii and Nzomoi (2013), Rahman and Salahuddin (2010), Enisan and Olufisayo (2009), Agrawalla and Tuteja (2007), Buelens et al. (2006), Adjasi and Biekpe (2006), Arestis et al. (2001), and Levine and Zervos (1998), which find that stock markets development had positive impact on economic growth.

However, the value of stocks traded ratio, (STKTRADE2GDP), and number of companies listed on the exchange, (LCOYSL), are statistically significant but they both have an inverse relationship with GDP in the short run.

The turnover ratio of stocks traded (TRNVR) is not statistically significant but has a positive relationship with GDP. These is partially in line with the results in Ujunwa and Salami (2010), and Bernand and Austin (2011), which found evidence of positive relationship for some countries, and an inverse relationship for others. The two indicators of banking sector development - broad money to GDP (BRDM2GDP) and Gross domestic savings to GDP (GDS2GDP) have contrasting relationship with GDP in the short run. BRDM2GDP is not statistically significant whereas GDS2GDP has a positive relationship with GDP and not statistically significant. Indeed, Gambacorta et al. (2014) and Akinboade and Kinfaek (2015) also find a direct relationship between bank-based financial development and economic growth; whereas Bolbola et al. (2005) conclude that there is an inverse relationship between bank-based financial development and economic growth.

Inflation rate (INFL) and exchange rate (LEXCR) are two macroeconomic stability indicators in the test. Our result confirms the basic economic theory that inflation has a negative relationship with GDP. And it is statistically significant. LEXCR, on the other hand, has a direct relationship with GDP and is also statistically significant. This is in line with Levy-Yeyati and Sturzenegger's (2002) findings that there is a correlation between exchange rate and economic growth, even though the influence might not be clear.

Results of the regression reveal that the influence of exchange rate (LEXCR) on economic growth in the five selected countries is positive in the short run. In the case of LPERCPTGDP, it is statistically significant, also has a highly positive relationship with GDP in the short run. Foreign direct investment which is inflows to GDP (INFLWS2GDP) is not statistically significant but has a positive relationship with GDP. Prasad, et al (2007), Carkovic and Levine (2002) and Adams (2009) in their different studies fail to agree on the relationship between FDI and economic growth. However, the results of the regression show that the FDI ratio (INFLWS2GDP), which is used as a measure of private capital flow in this paper, does not have an impact on economic growth in the short-run.

In addition, results from the long run regression indicate that market capitalization to GDP (MKCAP2GDP) is statistically significant but it has a negative coefficient. However, STKTRADE2GDP and LCOYSL are both statistically significant and have a direct relationship with GDP. TRNVR is not statistically significant and has an inverse relationship with economic growth. BRDM2GDP is statistically significant and has an inverse relationship with economic growth also. INFLWS2GDP is statistically significant and has positive coefficient. GDS2GDP has a negative coefficient and it is statistically significant. LEXCR is not statistically significant and has an inverse relationship with GDP. INFL, on the other hand, has a positive coefficient but not statistically significant. LPERCPTGDP is both statistically significant and has a positive relationship with GDP in the long run.

LIMITATIONS OF THE STUDY

This study suffers from a few limitations just like any other study, notwithstanding the efforts to make this study analytically defensible. First, the study may suffer from the problem of insufficient data. The choice of annual data was not ideal for this study. In studies of this nature, quarterly data are more desirable. The use of annual data could have reduced the precision of the parameter estimates. The Dynamic OLS Model is considered a better estimation model. However, there are a few limitations -- it does not give lag length and secondly, it does not give the coefficient of the constant term.

CONCLUSION

The purpose of this paper is to study the effect of stock market on economic growth in Ghana, Cote d'Ivoire, Nigeria, Mauritius and South Africa using a panel data set for the period 1993 to 2016. The stock market development indicators used were segmented into market development variables, liquidity variables and size variables. Market capitalization ratio was employed as a measure of the economic significance of stock markets. We used Panel Dynamic Least Squares (DOLS) and Panel OLS regression methods to test for short term and long term impacts respectively. Results, however, were conflicting. Market capitalization to GDP ratio was found to be a good predictor of economic growth in the short run. In the long run, however, it was found to have an inverse relationship with GDP, hence not a good predictor of GDP.

All in all, using stock market capitalization ratio as the main indicator of stock market development, the study partially confirmed the first hypothesis of the paper. That is, stock market development probably drives economic growth. Policy-wise, an increase in market capitalization, higher income level, and a favorable exchange rate can be used to drive economic growth in the five selected countries in the short run. In the long run, economic growth can be achieved by improving income level, increasing value of stocks traded, and encouraging more companies to list on the exchanges.

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Appendix 1. Correlation of Variables

	MKCAP2GDP	STKTRAD E2GDP	TRNVR	LCOYSL	LPERCPTGDP	BRDM2GDP	BC2PSGDP	GDS2GDP	INFLWS2GDP	INFL	LEXCR
MKCAP2GDP	1.00	0.91	0.61	0.68	0.60	0.49	0.66	0.14	-0.27	-0.20	-0.20
STKTRAD E2GDP	0.91	1.00	0.74	0.60	0.46	0.37	0.52	0.14	-0.21	-0.15	-0.17
TRNVR	0.61	0.74	1.00	0.54	0.31	0.22	0.36	0.20	-0.19	-0.04	-0.02
LCOYSL	0.68	0.60	0.54	1.00	0.32	0.12	0.37	0.25	-0.15	-0.07	0.08
LPERCPTGDP	0.60	0.46	0.31	0.32	1.00	0.83	0.86	0.23	-0.27	-0.50	0.06
BRDM2GDP	0.49	0.37	0.22	0.12	0.83	1.00	0.94	0.08	-0.22	-0.36	-0.10
BC2PSGDP	0.66	0.52	0.36	0.37	0.86	0.94	1.00	0.07	-0.23	-0.37	-0.08
GDS2GDP	0.14	0.14	0.20	0.25	0.23	0.08	0.07	1.00	-0.27	-0.10	0.53
INFLWS2GDP	-0.27	-0.21	-0.19	-0.15	-0.27	-0.22	-0.23	-0.27	1.00	0.21	-0.23
INFL	-0.20	-0.15	-0.04	-0.07	-0.50	-0.36	-0.37	-0.10	0.21	1.00	-0.34
LEXCR	-0.20	-0.17	-0.02	0.08	0.06	-0.10	-0.08	0.53	-0.23	-0.34	1.00

Appendix 2. Results of Stationarity Test

Variable	Stationarity of all variables in Levels		Stationarity of all variables in First Difference	
	Individual intercept	Individual intercept and trend	Individual intercept	Individual intercept and trend
LGDP	0.1977*	0.2207*	0.0000**	0.0000**
MKCAP2GDP	0.0519**	0.1031*	0.0000 **	0.0000 **
STKTRADE2GDP	0.0013**/**	0.0041**	0.0000**	0.0000**
LCOYSL	0.1225*	0.4644*	0.0000**	0.0001**
TRNVR	0.0000 **	0.0000**	0.0000**	0.0000**
LPERCPTGDP	0.2456*	0.6053*	0.0000**	0.0000**
GDS2GDP	0.0002**/**	0.0064**/**	0.0000**	0.0000**
BRDMGDP	0.3601*	0.3242*	0.0000**	0.0000**
INFLWS2GDP	0.0009**	0.0002**	0.0000**	0.0000**
LEXCR	0.0121**/**	0.1813*	0.0000**	0.0000**
INFL	0.0000**	0.0000**	0.0000**	0.0000**

Note: *=unit root; **=majority of all methods or all = no unit root; **/**= 50% of methods=no unit root and 50% of methods=unit root.

Appendix 3. Cointegration Test & Kao Residual Cointegration Test

Names of Series

MKCAP2GDP STKTRADE2GDP TRNVR LCOYSL BRDM2GDP INFLWS2GDP

LPERCPTGDP GDS2GDP INFL LEXCR

Newey-West automatic bandwidth selection and Bartlett kernel

ADF	t-statistic	Prob.
	3.635643	0.0001
Residual variance	295.1820	
HAC variance	99.48130	

Augmented Dickey-Fuller Test Equation: Dependent Variable: D(RESID)

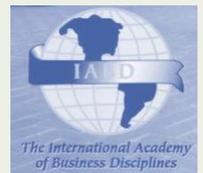
Variable	Coefficient	Standard Error	t-statistic	Prob.
Resid (-1)	-0.744558	0.109571	-6.795211	0.0000
D (Resid (-1))	0.020200	0.086707	0.232973	0.8162
S.E.of regression	13.34304		Mean dependent var	-0.951774
Log likelihood	-440.0835		S.D. dependent var	17.03698
Durbin-Watson stat	2.047141		Schwarz criterion	8.086981
R-Squared	0.392255			
Adjusted R-Sq	0.386627			
Mean dependent var	-0.951774			
S.D. dependent var	17.03698			
Schwarz criterion	8.086981			

QRBD

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