Stock market and economic growth: Evidence from Granger causality test

Tan Zhongming • Koomson Prince* • Ding Guoping • Chibsah Rahmatu • Obu Linda

Department of Finance, School of Applied Economics, Jiangsu University, No. 310 Xuefu Road, Zhenjian 212013 Pr China.

*Corresponding author. E-mail: thepapacy1@gmail.com.

Abstract. This study is aimed at determining the contributions of the Ghana stock market to the economic growth in Ghana from 1993 to 2015. This is necessitated by the concern as to whether a lean stock market like that of GSE with an average of 32 listed companies (within the period of study) with an average market capitalisation of 7.66% of GDP can significantly exert the much expected positive impact on total output. Four explanatory variables were specified for this study based on theoretical underpinning. Stationarity test was conducted using Augmented Dickey Fuller unit root test, whiles Johansen Cointegration test was used to estimate the long-run equilibrium relationship among the variables. The Granger causality test was conducted in order to establish causal relationship. Emirical test results shows that there is a bidirectional causality between economic growth (RGDP) and market capitalization of listed companies, whereas there is unidirectional causality between economic growth (RGDP) and stock turnover ratio, also, there is bidirectional causality between economic growth (RGDP) and market capitalization of listed companies, it was revealed that, there exist bidirectional causality between economic growth (RGDP) and the stock traded, there is an unidirectional causality between economic growth (RGDP) and number of listed companies on the exchange. From the analysis it was brought to light that there is apossitve relationship between the variables identified and Real Gross Domestic Product but this effect will be evident in the long term in the economy of Ghana. he study recommends that the government should restore confidence to the market through regulatory authorities by ensuring transparency, fair trading transactions and improve the market capitalization by encouraging more foreign investors to participate in the market and also to increase investment instruments such as derivatives, convertibles, swap and option in the market.

Keywords: Ghana Stock Exchange, capital market, economic growth and cointegration, economic growth.

INTRODUCTION

Many researchers such as Korajczyk (1996), Levine and Zervos (1996), Levine and Zervos (1998), Filer *et al.* (1999), Rousseau and Wachtel (2000), Beck and Levine (2001), Miner (2003), and Rioja Valev (2004), have researched into the use of the stock market as a predictable tool for predicting the role of the stock markets towards the economic growth of many countries such as Nigeria and South Africa. It is worth to note that stock markets have played various roles towards the acquisition of capital for economic growth for individuals, firms and governments. According to Osamwonyi (2005),

a stock exchange is an arrangement for trading financial securities and where one can raise long-term capital. The basic objective of a stock market is to trade financial instruments and help raise long term capital. Many developing countries have adopted the use of the stock market as a catalyst for accelerating economic growth. In contrast, some liquid equity market permits investors to trade their stocks easily, thus allowing firms to increase equity wealth on good terms by enabling more profitable investments in the long run, a liquid market improves the allocation of capital and enhances prospects for long-

term economic growth. Again the capital market is concerned with raising capital by dealing in shares and bonds and other long-term instruments.

Functions of a capital market

Suffice it to mention here the capstone points on the functions of the capital market:

a) Financial intermediation from funds surplus to funds deficit institutions
b) Offering enterprise new and wider opportunities for obtaining funds.
c) Acting as means of exchanging securities at mutually satisfactory prices thereby creating liquidity through its pricing mechanism.
d) Acting as a means of ascertaining securities prices.
e) Acting as an easily accessible means of efficient trading in securities, creating awareness among and between retail and institutional investors between and across international boundaries.
f) Allocating and rationing funds among competition users or uses.
g) The Ghanain capital market has some roles in economic development and this could be highlighted in the following ways:

i. Providing a means for raising finance to help firms to expand and develop.
ii. As a vehicle for allocating the nation's financial resources between and among various industries and firms.
iii. Provide liquidity for investment funds for individuals and corporate bodies.
iv. Serves as a measure of confidence in the economy and economic barometer.
v. The capital market pricing mechanisms provide the industrial management with the concept of cost of capital which determines the level and rate of investment.
vi. Through the second-tier securities market the capital market promotes small and medium sized industries.
vii. By means of bonification of the domestic national debts, otherwise known as securitization which makes the debts negotiable and discountable through the CBN to provide liquidity to lenders who would wish to en-cash their bonds instrument.

Generally speaking, economic development refers the problems of underdeveloped countries and economic growth to those of developed countries. Maddison (1970) makes distinction between the two terms in this sense when he wrote "the raising of income levels is generally called "economic growth" in rich countries and in poor ones it is called "economic development". But this view does not specify the underlying forces, which raises the income levels in the two types of economies. Hicks (1957) pointed out in this connection that the problems of

underdeveloped countries are concerned with the development of unused resources even though their uses are well known while those of advanced countries are related to the growth, most of their resources being already known and developed to a considerable extent.

Basically the capital markets are made up of two main markets:

1. The primary market
2. The secondary market

The primary market operates when the initial capital raising takes place. It is also known as the New Issue market. Through the primary market operations, Governments and industrialists are able to raise long-term loans to finance developmental projects and for expansion and modernization of industries respectively. This market channel of every country exacts enormous impact on the country's economy thus a businessmen and nascent industrialists could otherwise have no organized market where they could raise long term loans for investment purposes. Subsequently, the mobilization of long term funds for productive purposes in an economy could have been difficult without capital markets.

The secondary market, is where securities are bought and sold after its issuance in the primary market. Thus, through this market channel, means are provided for restoring liquidity to investors and allowing them to spread their risks while the borrowers such as Governments and industrialists retain the funds in their investments. Activities of the exchange through these channels provide it with the functions of mobilizing saving from the surplus spending unit (SSU) of the economy and allocate them to the deficit spending unit (DSU). Where greater proportion of these funds go to those investments with the highest rates of return after giving due allowance for risks. This allocative function of the capital market is crucial in determining the overall growth and efficiency of the economy.

If capital resources are not provided to those economic units where demand is growing, and which are capable of increasing productivity, and at the appropriate time, the growth rate of the economy will be inevitably compromised.

Ghana stock exchange market

The idea of establishing a Stock Exchange in Ghana laid on the drawing board for almost two decades prior to its implementation. In February 1989, the issue of establishing a stock exchange moved a higher gear when a 10 - member National Committee, under the Chairmanship of Dr. G.K. Agama, then Governor of the Bank of Ghana, was set up by the Government.

The work of the committee was to consolidate all previous work connected to the Stock Exchange project and to fashion out modalities towards the actual

establishment of the Exchange. As a result of the work of the committee, the Stock Exchange was established in July 1989 as a private company limited by guarantee under the Companies Code of 1963. It was given recognition as an authorized Stock Exchange under the Stock Exchange Act of 1971 (Act 384) in October 1990. The Council of the Exchange was inaugurated on November 12, 1990 and trading commenced on its floor the same day. The Exchange, changed its status to a public company limited by guarantee in April 1994.

In Ghana the Securities and Exchange Commission (SEC), the Bank of Ghana (BoG), the Ghana Stock Exchange (GSE), the Ministry of Finance and Economic Planning (MoFEP) and Stock brokerage firms form the bedrock of market regulation, management and operations. Ghana successfully established a stock exchange in 1989. Yet, actual trading activities began in 1990. The establishment of the stock exchange, and for that matter, the capital market stemmed from the fact that a well-functioning capital market was seen as a catalyst for accelerating Ghana's economic growth and development. As noted by Sowa (2003), after a doleful performance in the 1980's, Ghana liberalized its financial system under the Financial Sector Adjustment Program (FINSAP) to include the establishment of capital market as part of its overall 1988 macroeconomic adjustment program.

Gradually, the market is building inroads on the African continent. The Ghana capital market was adjudicated as the world's best performing market at the end of 2004 with a year return of 144 per cent in US dollar terms compared with a 30 per cent return by Morgan Stanley Capital International Global Index (Databank Group, 2004). After the official listing of Tullow Oil Plc on the exchange on Wednesday July 27, 2011, the GSE was reported to be the third largest capital market in Sub-Saharan Africa, after South Africa and Nigeria (Seidu, 2011). In 2012, the stock market appeared very effervescent for equity investors. This is shown by improvement in the All-Share Index in 2012 which increased by about 23.81%. By the end of December, 2012, the Ghana Stock Exchange had thirty-four (34) listed companies. The turnover volume for the reviewed year was GH₵218,134,338 ($121,185,743), representing a decline in growth of about 48.04% compared with the figure of GHc₵419,791,082 ($278, 007, 339) in 2011 (ISSER, 2013). Conversion of the cedi to US dollar was based on the exchange rates for the respective years. They are as follows: December, 2010 (GH₵1.43 to $ 1.00); December, 2011 (GH₵1.51 to $ 1.00); December, 2012 (GH₵1.80 to $ 1.00); and December, 2013 (GH₵1.97 to $ 1.00).

Despite some of the successes chalked by the market, some reports suggest that it has a small market size, low market liquidity, and low market participation by the public (Acquah-Sam and Salami, 2013).

Historically, the Exchange was set up with the following

objects:

i. To provide the facilities and framework to the public for the purchase and sales of bonds, shares and other securities;
ii. To control the granting of quotations on the securities market in respect of bonds, shares and other securities of any company, corporation, government, municipality, local authority or other body corporate;
iii. To regulate the dealings of members with their clients and other members;
iv. To co-ordinate the stock dealing activities of members and facilitate the exchange of information including prices of securities listed for their mutual advantages and for the benefit of their clients;
v. To co-operate with associations of stockbrokers and Stock Exchanges in other countries, and to obtain and make available to members information and facilities likely to be useful to them or to their clients.

The primary objective of this paper is to assess whether the existence of the Ghana excahnge market contributes to the economic development of Ghana.

LITERATUR REVIEW

Studies by various researchers have been conducted on what the capital market exists for. It is worth to note that the capital market basically operates by marching funds to investors, in light of this it is necessary for investors to carefuly assess the risk involved in dealing with the stock markets, which can inturn enhance or impede an economy as a goal. Accrding to Tan *et al.* (2017), the world of financial investment is a very risky and volatile field to venture as such a careful and critical risk and return analysis is required to avoid any shocks. Their work justifies the purpose for the operation of capital markets. Capital markets are established to help with the financial dealing of individuals, firms and governments.

According to Saint-Paul (1992) in Alovsat (1998), stock exchanges contribute to economic growth through the global risk diversification opportunities they offer. Generally, stock market is expected to accelerate economic growth by providing a boost to domestic savings and increasing the quantity and quality of investment (Singh, 1997). The stock market stimulates economic growth through savings amongst individual, providing avenue for business financing and efficient allocation of resources in the economy. One of the most fundamental strategies of economic growth is simply to increase the proportion of national income saved. If we can raise savings we can increase the rate of GDP growth (Todaro and Smith, 2009). Foreign direct investment (FDI) is another channel through which foreign technology permeates domestic economy. (Ogunkola *et al.*, 2006). The stock market generates

efficient information about the performance of firms, reflecting the fundamentals in the real sector. The indicators of the performance of the stock markets are market capitalization, trading value, turnover ratio and many more. In a study by Levine and Zervos (1996) where they used composite index combining volume, liquidity, and diversification indicators for stock exchange and the real growth rate in per capita GDP as economic growth indicator found that a very strong positive correlation exist between stock market development and economic growth.

Some of the studies on the link between stock market development and economic growth include: Korajczyk (1996), Levine and Zervos (1996), Levine and Zervos (1998), Filer *et al.* (1999), Rousseau and Wachtel (2000), Beck and Levine (2001), Miner (2003), Rioja and Valev (2004) and Caporale *et al.* (2004), and amongst others. Filer *et al.* finds that an active equity market is an important engine of economic growth in developing countries. When Caporale *et al.* (2004) examined the causal link between stock market development, financial development and economic growth in seven countries; they found that a well-developed stock market can foster growth in the long-run. Odhiambo (2010) used the Auto-Regressive Distributed Lag (ARDL-Bound) testing approach to relate three proxies of stock market development namely (stock market capitalization, stock market traded value, and stock market turnover) with real GDP per capita, a proxy for economic growth. The result was that causal relationship between stock market development and economic growth is sensitive to the proxy used for measuring the stock market development.

Also, a study conducted in Nepal by Bahadur and Neupane (2006) revealed that the stock market growth and economic growth have long-run relationship. It also revealed that the stock market fluctuation do help to predict the future economy. Osinubi (1998) discovered the contrary, that the effect of stock market on economic growth is weak and insignificant. In a study by Donwa and Odia (2010), they found that market capitalization and value of transaction had positive but insignificant impact on the GDP whereas the total new issues had a negative influence on GDP. Salisu and Ajide (2010) also found that stock market development causes growth as consistent with the findings of Mohtadi and Agarwal (2004), and Oke (2005). They discovered that the direction of causality is from market capitalization to economic growth and also that there is no causal linkage between total value traded ratio and economic growth. While a bidirectional causality was found between turnover ratio and economic growth.

Capasso (2006) using a sample of 24 advanced Organization for Economic Cooperation and Development (OECD) and some emerging economies investigates the linkage between stock market development and economic growth covering the period 1988 to 2002. The finding shows a strong and positive correlation between stock market development and economic growth and

later concludes that stock markets tend to emerge and develop only when economies reach a reasonable size and with high level of capital accumulation.

Singh (1997) utilizes time series data for India to examine the relationship between financial development and economic growth for the period 1951-1952 to 1995-1996. Using Bivariate Vector Autoregressive (VAR), impulse responses and variance decomposition, their results suggest the existence of bidirectional Causality between financial development and economic growth.

Capital market and economic growth

Osaze (2000) sees the capital market as the driver of any economy to growth and development because it is essential for the long term growth capital formation. It is crucial in the mobilization of savings and channeling of such savings to profitable self-liquidating investment. The Nigerian capital market provides the necessary lubricant that keeps turning the wheel of the economy. It not only provides the funds required for investment but also efficiently allocates these funds to projects of best returns to fund owners. This allocative function is critical in determining the overall growth of the economy. The functioning of the capital market affects liquidity, acquisition of information about firms, risk diversification, savings mobilization and corporate control (Anyanwu, 1998). Therefore, by altering the quality of these services, the functioning of stock markets can alter the rate of economic growth (Equakun, 2005).

Okereke-Onyiuke (2000) posits that the cheap source of funds from the capital market remain a critical element in the sustainable development of the economy. She enumerated the advantages of capital market financing to include no short repayment period as funds are held for medium and long term period or in perpetuity, funds to state and local government without pressures and ample time to repay loans.

Nyong (1997) developed an aggregate index of capital market development and used it to determine its relationship with long-run economic growth in Nigeria. The study employed a time series data from 1970 to 1994. For measures of capital market development the ratio of market capitalization to GDP (in percentage), the ratio of total value of transactions on the main stock exchange to GDP (in percentage), the value of equities transaction relative to GDP and listings were used. The four measures were combined into one overall composite index of capital market development using principal component analysis. A measure of financial market depth (which is the ratio of broad money to stock of money to GDP) was also included as control. The result of the study was that capital market development is negatively and significantly correlated with long-run growth in Nigeria. The result also showed that there exists bi-directional causality between capital market development and economic growth.

and economic growth.

Obreja Brasoveanu *et al.* (2008) examined the correlation between capital market development and economic growth in Romania using a regression function and VAR. It was shown that capital market is positively correlated with economic growth, with feedback effect. Moreover, they revealed that the strongest link is from economic growth to capital market. Ewah *et al.* (2009) appraise the impact of the capital market efficiency on the economic growth of Nigeria using time series data from 1961 to 2004. They found that the capital market in Nigeria has the potential of growth inducing but it has not contributed meaningfully to the economic growth of Nigeria because of low market capitalization, low absorptive capitalization, illiquidity, misappropriation of funds among others. The study concluded that, the capital market remain one of the mainstream in every economy that has the power to influence economic growth, hence the organize private sector is encouraged to invest in it. Donwa and Odia (2010) empirically analyze the impact of the Nigerian capital market on her socio-economic development from 1981 to 2008. Using the ordinary least square it was found that the capital market indices have not impact significantly on the GDP. To position the market for growth, the study recommends that the government is therefore advised to put up measures to stem up investors' confidence and activities in the market so that it could contribute significantly to the Nigerian socio-economic development.

Mishira *et al.* (2010) examine the impact of capital market efficiency on economic growth in India using the time series data on market capitalization, total market turnover and stock price index over the period spanning from the first quarter of 1991 to the first quarter of 2010. The application of multiple regression model shows that the capital market in India has the potential of contributing to the economic growth of the country. Specifically, the study reveals that there is a linkage between capital market efficiency and economic growth in India. This linkage according to the study is established through high rate of market capitalization and total market turnover. Thus, the study suggests that the market organizations and regulations should be such that large number of domestic as well as foreign investors enters the market with huge listings, investments, and trading so that the very objective of optimal allocation of economic resources for the sustainable growth of the country can be ensured.

METHODS AND DATA

Data for the study were sourced from Securities and Exchange Commission's Annual Reports and Statistical Bulletin of Ghana, Annual Reports of various years, Data Bank group data base, World Bank development indicators data set, Central Banks of Ghana, journals and other publications (Table 1). The indicators of economic development used for the test include market capitalization ratio, total value traded, turnover ratio, number of listed securities whereas the growth rate of gross domestic product was used as a proxy for economic growth.

The model was based on those of past studies; Demirgue-Kunt and Levine (1996), Levine and Zervos (1996), Demirgue-Kunt *et al.* (1996), Cudi Tuncer and Alovsat (2001), Ariyo and Adelegan (2005), Osamwonyi, (2005), Ewah *et al.* (2009) and Donwa and Odia (2010), who have investigated the linkage between stock market development and economic growth.

Stock market activities play a major role in determining the level of economic activities in both emerging and developed economies, by providing and efficiently allocating capital for investment, providing appropriate platform to engender best corporate practices that will result in growing investment and further growth of the economy. What may not be clear is whether there is a long-run bidirectional causality between financial development and economic growth or not. Another grey area is the relationship between stock market indicators and the proxy for economic growth (real gross domestic product) in the emerging economies. Other studies show that while there is some consensus on the positive relationship between stock market development and economic growth, there is also disagreement on the direction of causal relationship with some suggesting that it is from finance to economic growth and others suggesting the opposite that the link is bidirectional. Some contend that there is no link between stock market development and economic development (Sililo, 2010). However, the causal relationship between the indicators of stock market development and economic growth in the developing countries is still a thing of controversy particularly in the Sub-Saharan region. Some critics of stock market integration point out that some exchanges in Africa are mere national status in that the supposed effect of their existence is not felt in the economy and that some exchanges stems from external influence rather than local demand (UNECA, 2006). In the light of this, we seek to find out, a causality relation between stock market development and economic growth in Ghana.

The study investigated causal relationship between stock market development and economic growth in Ghana. Specifically, the study investigated:

i. If there is a causal relationship between stock market development and economic growth in Ghana; and also
ii. Determine the direction of flow of causality between stock market development and economic growth in Ghana.

Estimation procedure

The study adopted the test for Stationarity, Cointegration and Granger Causality test. The time series properties of

Table 1. Research data.

Year	GDP %	MCP	NL	ST	TOR
1993	4.850001	2.04651	15	0.06872	3.357903
1994	3.3	34.88619	17	1.26732	3.632726
1995	4.112419	25.80456	19	0.291564	1.129893
1996	4.602461	23.91627	21	0.232877	0.973719
1997	4.196358	16.39094	21	0.599451	3.657209
1998	4.700391	18.54051	21	0.765543	4.129026
1999	4.399997	11.91809	22	0.257664	2.161957
2000	3.7	10.03407	22	0.139674	1.392
2001	4	5.268198	22	0.235187	4.464286
2002	4.5	5.675985	24	0.162171	2.857143
2003	5.2	8.385298	25	0.576358	6.873438
2004	5.900004	5.404572	29	0.820594	15.18333
2005	6.399912	5.68413	30	0.475231	8.360656
2006	4.346819	3.7238	32	0.252826	6.789474
2007	4.4	9.698726	32	0.587265	6.055079
2008	9.149799	9.970873	35	1.005367	10.08304
2009	4.845756	9.342652	35	0.199401	2.134305
2010	7.89974	9.161494	31	0.316397	3.453552
2011	14.046	7.831186	29	0.642213	8.200716
2012	9.292512	2.35496	29	0.121603	7.425681
2013	7.312525	6.312554	29	0.403514	5.226584
2014	3.985866	5.364865	29	3.568457	2.846521
2015	3.917222	7.598564	32	4.158268	4.598762

Source: Authors compilation from World Bank, World Development Indicators, Ghana Stock Exchange Annual Reports & Accounts, 2017.

the data were examined by conducting the test for Stationarity and Cointegration. This was done as a pretest for Granger Causality test. "The test for Cointegration should precede tests of causality" (Gujarati, 2003:793); hence, test for Cointegration was conducted and also Granger Causality test. The Econometric procedure was conducted using stata. Estimates were done using the constants of Cointegration using the Augmented Dickey-Fuller Test as well as the trace test and the maximum eigen value which is the vector error correction model.

Model specification

The economic model is given as: $Y_t = F$ (turnover ratio, mktcptl, stktraded, nlisted)
Where; Y_t is rgdp that is real gross domestic product
Turnover ratio is the stock turnover ratio of domestic shares
MCP is the market capitalization of listed companies
ST is the total value of stocks traded
NL is the number of listed companies on the stock

exchange
The econometric model is therefore given as;

$$RealGDP_t = \eta turnoverratio_t^{\alpha 1} mktcptl_t^{\alpha 2} stktraded_t^{\alpha 3} nlisted_t^{\alpha 4} + \mu_t \qquad (1)$$

Estimating the log-linear form of the econometric model by applying logarithm to Equation 1 above to obtain:

$$lnRealGDP_t = ln\eta_t + \alpha 1\ lnTOR_t + \alpha 2\ lnMCP_t + \alpha 3\ lnST_t + \alpha 4\ lnNL_t$$

Given that, $ln\eta = \alpha 0$ is the long run model for growth and the respective error terms will be specified as;
$$lnRealGDP_t = \alpha 0 + \alpha 1\ lnTOR_t + \alpha 2\ lnMCP_t + \alpha 3\ lnST_t + \alpha 4\ lnNL_t + \mu_t \qquad (2)$$

Where μ is the error term, t is the time variable and ln is the logarithm of the respective variables, α_1 to α_4 are the elasticities of the respective variables. The study the natural logarithm in order to effectively linearize exponential trends if any in the time series data since log function is the inverse of an exponential function

(Asteriou and Price, 2007).

Unit root test

The non-stationary nature of most economic time series variables in the level forms causes unpredictable result in time series analysis, making regression output to be spurious and unreliable. The ADF unit root test can be used to check serial correlation. AIC (Akaike Information Criterion) is used in choosing the lagged length to ensure residuals are not serially correlated. The null hypothesis is given as there is a unit root with the alternative as the series is stationary. The regression model is therefore given as:

$$\Delta Y_t = \alpha + \lambda_t + \beta Y_{t-1} + \Sigma \, \delta \Delta Y_{t-1} + \xi_t \qquad (3)$$

Where Y_t denotes the series at time t, Δ is differencing operator, α, λ, β, δ are the parameters to be estimated and ξ_t is the random error term. Therefore, the ADF test the null hypothesis of no unit root (stationary) as:
$H_0: \beta = 0$
$H_1: \beta \neq 0$

If the t-statistic is more negative than the critical values, the null hypothesis is rejected and it implies that the series is stationary at the first difference. Alternatively, if the t-statistics is less negative than the critical values, the null hypothesis is accepted and the conclusion is that the series is non-stationary at the first difference.

Cointegration test

In checking and estimating the presence of equilibrium of the long run relationship between time series variables, the Johansen Multivariate approach that uses the vector autoregression model and vector error correction model was used. The VAR and VECM are useful for checking the impact of unforeseen or unanticipated shocks on the endogenous variable and can also be used to determine the importance of each variable in explaining the variations of the endogenous variables. That is, the impulse response and variance decomposition analysis.

Johansen technique makes use of two tests in estimating the presence of long run equilibrium among time series variables, that is, the number of cointegrating vectors. These are the Trace test and the maximum Eigen Value. The null hypothesis of no cointegration is then tested against the alternative of the presence of cointegration.

Granger causality test

Causality means the ability of a variable to be able to predict or forecast the other. Granger causality in the

case of two time series variables say X and Y, variable X is said to granger-cause variable Y, if Y can be better predicted using the histories of both X and Y than it can, using the histories of Y alone. To show the direction of causality in the presence of cointegrated vectors, Granger causality for a multivariate time series is modeled by fitting a Vector Autoregressive (VAR) model as:

$$\Delta Y_t = \alpha_0 + \delta_{1t} + \lambda_1 e_{t-i} + \Phi_{1i} \Delta Y_{t-i} + \beta_{1i} \Delta X_{t-i} + \xi_t \qquad (4)$$

$$\Delta X_t = \alpha_0 + \delta_{2t} + \lambda_2 e_{t-i} + \Phi_{2i} \Delta Y_{t-i} + \beta_{2i} \Delta X_{t-i} + \xi_t \qquad (5)$$

Where ΔY_t and ΔX_t are the non-stationary series, e_{t-i} is the error correction term, t and t-i show current and lagged values. The error correction terms are included in the model since they are cointegrated. To now examine if the independent variable Granger-cause the dependent variable, thus, X Granger-cause Y, we test the following hypotheses with the null hypothesis stating that, the independent variable (X) does not Granger-cause the dependent variable (Y). Also, to find if the independent variable (Y) in Equation 5 Granger-cause the dependent variable (X), we test the hypothesis with the null hypothesis stating that the independent variable (Y) does not Granger-cause the dependent variable (X). After carrying out this test, four possible outcomes exist using the F-test. First, rejecting the null hypothesis in Equation 4 but failing to reject the null in Equation 3.8. Second, rejecting the null in Equation 5 but failing to reject the null in (3.7). Third, rejecting the null in both equations simultaneously. Fourth, failing to reject the null in both equations. The first outcome indicates unidirectional causality from X to Y. The second outcome indicates unidirectional causality from Y to X. The third outcome indicates bi-directional causality and the fourth outcome indicates independence or no causality between the variables.

From Table 2, the overall significance of the model given the f-value at degree of freedom 4 and 18 is statistically significant with a p-value of 0.0140. About 88% of the variations in the dependent variable (RGDP) is being explained by the independent variables (TOR, MCP, ST, NL) which is given by the R-squared = 0.8836 . With this, we can say the model is fit.

Looking at the individual significance of each variable in the model, one percent change in stock turnover ratio changes real gdp by 0.307. The positive coefficient of turnover ratio indicates a positive impact of it on real gdp. It is statistically significant with the p-value of 0.016. Secondly, a one percent change in market capitalization of listed companies changes real gdp by 0.133. The positive coefficient of market capitalization indicates a positive impact of it on real gdp. It is statistically insignificant with the p-value of 0.285 which is far greater than 0.05. Also, a percent change in stock traded changes real gdp by 0.180. The negative coefficient of stock traded indicates a negative impact of it on real gdp.

Table 2. Analysis of variance.

Source of variation	SS	Df	MS
Model	1.345	4	0.336
Residual	1.436	18	0.079
Total	2.780	22	0.126
Rgdp	**Coefficient**	**Standard error**	**Test statistic**	**P-value p > |t|**
TOR	.3072542	.1157848	2.65	0.016
MCP	.1334063	.1209664	1.10	0.285
ST	-.1800934	.0815469	-2.21	0.040
NL	.7611685	.3485326	2.18	0.042
Cons	-1.660418	1.288031	-1.29	0.214

**Number of obs = 23 **$F_{(4,18)}$ = 4.21 **Prob > F = 0.0140 **R-squared = 0.8836 **Adj R-squared = 0.8689.

Table 3. Unit root test.

Levels			First difference			
VAR	**ADF statistics**	**P-value**	**VAR**	**ADF Statistics**	**P-value**	**I ( )**
Lrgdp	-2.409	0.1392	d. Lrgdp	-	-	1
LTOR	-2.722	0.0703	d.LTOR	-5.214	0.000	1
LMCP	-3.626	0.0053	d. LMCP	-8.924	0.000	1
LST	-3.467	0.0089	d.LST	-6.312	0.000	1
LNL	-2.762	0.0639	d. LNL	-5.574	0.000	1

Table 4. Johansen cointegration test.

	Eigen value	Trace statistics	5% critical value
0	.	137.9013	68.52
1	0.97813	57.6218	47.21
2	0.70081	32.2815	29.68
3	0.62268	11.8138*	15.41
4	0.26691	5.2934	3.76
5	0.22281		

It is statistically significant with the p-value of 0.040. Also, a percent change in number of listed companies on the stock exchange changes real gdp by 0.761 whereby the positive coefficient indicates a positive impact of number of listed companies on real gdp. It is statistically significant with the p-value of 0.042. Finally, cons indicating the long run model for economic growth holding all other variables as constant. The negative coefficient of the cons indicate that, holding all other variables constants, economic growth will fall by 1.660 even though it is not statistically significant.

From Table 3, rgdp is stationary at the level with the p-value of 0.1392, meaning failing to reject the null hypothesis of no unit root which implies stationarity. Stock turnover ratio was not stationary at the level with a p-value of 0.0703, meaning the null hypothesis of no unit root was rejected. But after the first difference, it became stationary with the p-value of 0.000. Also, market capitalization of listed companies was not stationary at the level with a p-value of 0.0053, meaning the null hypothesis of no unit root was rejected. However, it became stationary after the first difference with the p-value of 0.000. Again, stock traded was not stationary at the level with a p-value of 0.0053 but it became stationary after the first difference and lastly, the number of listed companies on the stock exchange was not stationary at the level but it became stationary after the first difference with the p-value of 0.000.

From Table 4, comparing the test statistics with the critical value at 5% significant level, the Johansen test for cointegration is showing four cointegrating vectors. This implies that there is a long run equilibrium relationship between economic growth (RGDP) and the stock exchange variables. Hence, the null hypothesis of no cointegration was rejected at 5% percent confidence level.

Table 5. Granger causality test.

Null hypothesis	Chi-square	P-value	Decision
Lrgdp does not granger cause TOR	14.409	0.001	Reject
LTOR does not granger cause lrgdp	1.9746	0.373	Fail to reject
Lrgdp does not granger cause lMCP	19.431	0.000	Reject
LMCP does not granger cause lrgdp	14.585	0.001	Reject
Lrgdp does not granger cause IST	18.471	0.000	Reject
LST does not granger cause lrgdp	7.9554	0.019	Reject
Lrgdp does not granger cause lNL	18.064	0.000	Reject
LNL does not granger cause lrgdp	3.7858	0.151	Fail to reject

From Table 5, rgdp granger cause turnover ratio implying that the null hypothesis of no causality was rejected with p-value of 0.001 at 1% confidence level but turnover ratio does not granger cause rgdp implying that the null hypothesis of causality was failed to be rejected with the p-value of 0.373 at 1% confidence level. Hence there exist a unidirectional causality between economic growth (RGDP) and stock turnover ratio. Secondly, rgdp granger causes market capitalization implying that the null hypothesis of no causality was rejected with a p-value of 0.000 at 1% confidence level and market capitalization granger causes rgdp implying that the null hypothesis was rejected with the p-value of 0.001 at 1% confidence level. Hence, there is bidirectional causality between economic growth (RGDP) and market capitalization of listed companies. Also, rgdp granger causes stock traded implying that the null hypothesis was rejected with a p-value of 0.000 at 5% confidence level and also stock traded granger causes rgdp implying that the null hypothesis was rejected with a p-value of 0.019 at 1% confidence level. Hence, there exist bidirectional causality between economic growth (RGDP) and the stock traded. Lastly, rgdp granger causes number of listed companies on the stock exchange with a p-value of 0.000 at 1% confidence level but number of listed companies does not granger cause rgdp with p-value of 0.151 at 1% confidence level which means that, rejecting the null hypothesis in the former but failing to reject in the latter. Hence, there exist a unidirectional causality between economic growth (RGDP) and number of listed companies on the exchange.

CONCLUSION

This study attempts to examine the impact of capital market on economic growth in Ghana, utilizing capital market variables such as market capitalization, number of listed companies in the market, turnover ratio and stock traded of which the GDP was used as the benchmark for economic growth. Data gathered was for the period covering 1993 to 2015. Most empirical studies have held a consensus that the development of efficient capital market can promote growth of any given economy.

However, due to several problems identified to have prevented capital markets in developing countries, it is doubted whether capital market can contribute positively to economic growth of Ghana. Following from this debate, this study was undertaken to examine the impact of capital market on economic growth in Ghana. From the results obtained, capital market in Ghana has positive and significant impact on economic growth in Ghana but this growth can be realised in the long run equilibrium relationship between real gross domestic product and the stock exchange variables. TheTest results shows that there is a bidirectional causality between economic growth (RGDP) and market capitalization of listed companies, whereas there is unidirectional causality between economic growth (RGDP) and stock turnover ratio, also, there is bidirectional causality between economic growth (RGDP) and market capitalization of listed companies, it was revealed that, there exist bidirectional causality between economic growth (RGDP) and the stock traded, there is an unidirectional causality between economic growth (RGDP) and number of listed companies on the exchange. From the analysis it was brought to light that there is apossitve relationship between the variables identified and Real Gross Domestic Product but this effect will be evident in the long term in the economy of Ghana.

RECOMMENDATION

The authors recommend that the government should restore confidence to the market through regulatory authorities by ensuring transparency, fair trading transactions and improve the market capitalization by encouraging more foreign investors to participate in the market and also to increase investment instruments such as derivatives, convertibles, swap and option in the market.

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