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Does Stock Market Development Promote Economic Growth in Ghana?

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Abstract

The study investigates whether the stock market in Ghana contributes to the growth of the Ghanaian economy using quarterly data (2006Q1–2013Q2). A bounds testing approach to cointegration and Granger causality in the vector error correction model are used for analysis. The results of the cointegration analysis indicate that there is a long-run cointegrating relationship between stock market development and economic growth. The results of the causality analysis demonstrate that there is a unidirectional causality running from stock market development to economic growth. However, since the long-run regression analysis shows a negative relationship between stock market development and economic growth, we conclude that stock market development does not promote economic growth in Ghana.

Keywords: stock market development, economic growth, financial development, Ghana stock exchange

1. Introduction

The financial system facilitates the more effective exchange of goods and services, marshals individual and corporate savings, permits the more efficient allocation of resources and monitoring of corporate managements through capital markets, and enables the pooling of risk (Levine, 1997). The presence of financial intermediaries regardless of whether they are capital market institutions, commercial and savings banks, merchant banks, or finance houses enables exchange of liquid assets. Financial intermediaries facilitate investments, enable technological progress and accelerate growth. The development of the financial sector, thus, carries some interaction with economic growth (Lawrence, 2003). This has been the position of McKinnon (1973); Shaw (1973) and Patrick (1967).

Since the pioneering work of Patrick (1967) and the subsequent contributions by McKinnon (1973) and Shaw (1973), the finance-growth nexus has been subjected to much empirical scrutiny. The discourse has since shown many dimensions one of which is whether or not stock market development promotes growth. However, due to the underdevelopment of the capital markets in Africa, the discourse has mainly been confined to the relationship between the development of the banking sector and economic growth. This has resulted in a situation where the contribution of the stock markets to the growth of the African economies is patachy and inchoate. This study seeks to narrow this yawning knowledge lacuna by examining the relationship between the development of the stock market in Ghana and the growth of the Ghanaian economy.

The relevance of the study is embedded in its contributions. One, in terms of policy, the study informs policy makers about the need to review the existing architecture of the Ghana Stock Exchange (GSE) to make it instrumental to the growth process of the Ghanaian economy. In terms of contribution to knowledge, the study finds the GSE as one of the exchanges that undermine the growth processes of their economies. In addition, it adds to the few empirical studies on the relationship between stock market development and economic growth in Africa. In terms of methodological innovation, the study's bivariate design and its testing of direction of causality in the error correction model represent a paradigm shift from the previous studies on the finance-growth nexus in Ghana which have mostly adopted a multivariate design and the Granger Causality approach to causality analysis (Adusei, 2013; Quartey & Prah, 2008).

The rest of the paper is organized as follows. We briefly review the extant literature on the finance-growth nexus

followed by the methodology adopted for the study. The penultimate results section is the results section. The conclusion section ends the paper.

1.1 Review of Literature

Copious studies have been done on the finance-growth connection since the pioneering work of Patrick (1967). Notable ones from around the world include Chow and Fung (2013); Hye and Islam (2013); Ono (2012); Beck and Levine (2004); Rousseau and Wachtel (2000); Levine and Zervos (1998); Wachtel and Rousseau (1995); and King and Levine (1993). Notable Africa-specific studies include Adusei (2013a, b); Adusei (2012); Esso (2010); Odhiambo (2010); Agbetsiafa (2004); and Akinboade (1998).

In recent times, attempts have been made to expand the frontiers of the finance-growth debate by narrowing the discussions down to how the various sectors of the financial system affect growth. One of such studies is by Liang and Reichert (2012) which focuses on the impact of the non-bank financial institutions (NBFIs) on growth using cross-country data for both emerging and advanced countries. The authors show that NBFIs negatively impact economic growth and attribute their finding to the weak regulation of the NBFIs that might have allowed them to inject an excessive level of risk into the financial sector and the general economy. Another study by Adusei and Afrane (2013) also investigates the impact of credit union financial intermediation on economic growth with data from 12 credit union countries and reports that credit unions positively impact economic growth in the study countries.

It has been postulated that stock markets promote long-run growth by encouraging specialization as well as acquisition and dissemination of information (Greenwood & Jovanovic, 1990). Additionally, stock markets are projected as having the potential of cutting down the cost of savings mobilization thereby accelerating investment (Greenwood & Smith, 1997). From corporate governance perspective, a blossoming stock market may boost corporate control by attenuating the agency conflict between shareholders and managers through interest alignment between the two parties which may induce the latter to champion the shareholder value maximization agenda (Jensen & Murphy, 1990). In terms of liquidity (ability to trade equity with ease), stock markets mitigate the riskiness of assets traded in them due to the possibility of savers buying and selling quickly and inexpensively when they want to change their investment portfolios (Levine, 1991). Companies' ability to raise capital with ease is also considered to be one of the positive effects of well-functioning stock markets. Less riskiness of assets coupled with companies having access to capital with ease enhances capital allocation thereby promoting economic growth (Arestis, Demetriades, & Luintel, 2001). According to Levine (2001), when stock markets are functioning properly they influence growth via increased capital accumulation and efficiency of capital allocation. In sum, equity markets alter the rate of economic growth through liquidity, risk diversification, information acquisition about firms, corporate control, and savings mobilization services (Levine & Zervos, 1996).

Stock market liquidity despite being instrumental to economic growth could also have a negative impact on growth. Demirguoc-Kunt and Levine (1996) identify three channels through which this negative impact can occur. First, stock market liquidity by increasing returns on investment may end up undermining savings. Second, greater stock market liquidity reduces uncertainty among economic units which may decrease their demand for precautionary savings. Third, greater stock market liquidity may encourage euphoria and myopia in that it makes it possible for dissatisfied stock market participants to easily and quickly offload their securities which may culminate in lack of motivation to exert corporate control. This may have an adverse effect on corporate governance and ultimately undermine economic growth (Demirguoc-Kunt & Levine, 1996).

Going through the empirical literature on the stock market development-growth nexus reveals that there exist inconclusive results. One group of studies reports a positive impact of stock market on economic growth because stock market facilities the liquidity of capital and transfers capital to companies (Saci et al., 2009; Greenwood & Smith, 1997; Levine & Zervos, 1996; Bencivenga et al., 1995; Holmstrom & Tirole, 1993). Another set of studies reports that there is an inverse relationship between stock market and economic growth, arguing that stock market stimulates asymmetric information on companies and reduces savings (Devereux & Smith, 1994; Morck et al., 1990a, 1990b; Mayer, 1988).

Indubitably, these inconclusive results lend credence to the need for more investigations into the relationship between stock market development and economic growth. The current study is one of such investigations. It adds to the empirical literature with data from Ghana which is one of the emerging markets in Africa. It has opted for a time series approach because time series studies overcome the weaknesses inherent in cross-country ones. Cross–country growth regressions have measurement, statistical and conceptual problems and do not account for causality issues (Levine & Zervos, 1996).

2. Method

This section describes in detail how the study has been conducted. It describes measures of our varibales, the soruces of data and the analytical approach adopted.

2.1 Measures of Economic Growth and Stock Market Development and Data Sources

Due to lack of sufficient quarterly data on GDP growth rate, economic growth is proxied by GDP at 2006 constant prices. Since theory does not offer a unique concept or measure of stock market development (Levine & Zervos, 1996), we are compelled to follow precedent. In line with the previous studies, stock market development is proxied by the GSE All-Share Index (LnGSE) (Khan & Yousuf, 2013; Akbar et al., 2012; Naik & Padhi, 2012; Shan & Morris, 2002). The GSE All-Share Index and GDP data have been sourced from the GSE and Ghana Statistical Service respectively. These quarterly data cover the period 2006Q1–2013Q2.

2.2 Analytical Approach

Two cointegration techniques are used in the study: autoregressive distributed lag (ARDL) bounds testing approach to cointegration developed by Pesaran, Shin and Smith (2001) and Johansen Trace and Maximum Eigenvalue tests for Cointegration. We first perform the cointegration test using the ARDL approach and undertake confirmatory analysis using the Johansen Trace and Maximum Eigenvalue tests. Under the ARDL approach, two sets of critical values are provided by Pesaran et al. (2001) for cointegration test. The lower critical bound assumes that all the variables are I(0), implying there is no cointegration among the variables, while the upper bound assumes that all the variables are I(1). If the F-statistic is greater than the upper critical bound, then the null hypothesis is rejected. In that case a cointegrating relationship exists between the variables under consideration. On the other hand, if the F-statistic is less than the lower critical bounds value, it implies that there is no cointegrating relationship. If the F-statistic lies within the lower and upper bounds, then the test is inconclusive. Under the Johansen Trace and Maximum Eigenvalue tests, we compare the trace test and maximum eigenvalue with 5% critical values and conclude that there is cointegration if the values are higher than the 5% critical values.

We explore the long- and short-run relationships between economic growth and stock market development using the following equation in the ARDL form:

$$\Delta LnGDPt = C + \sum_{i=1}^{P} \alpha i \ \Delta LnGDP_{t-i} + \sum_{i=1}^{P} \beta i \ \Delta LnGSE_{t-i} + n_1 LnGDP_{t-1} + n_2 LnGSE_{t-1} + et \quad (1)$$

Where ΔLnGDPt represents change in natural logarithm of GDP as proxy for economic growth; C is the intercept of the equation; ΔLnGSE represents change in the natural logarithm of stock market development proxied by GSE All-Share Index. In equation 1, the terms with summation signs represent the error correction dynamics whilst the ones with n signs represent a long-term relationship.

Before a cointegration analysis is performed, it is required that the presence or otherwise of unit roots in the series under consideration is ascertained. Cointegration analysis demands that the series must be integrated of the same order though the ARDL approach permits the use of I(0) and I(1) variables.. To establish the presence or otherwise of unit roots we employ Augmented Dickey- Fuller (ADF) procedure as well as Phillips-Perron (PP) test of unit root.

2.3 Granger Causality Analysis

Engle and Granger (1987) and Granger (1988) submit that where there is cointegration between the variables under consideration, causality tests should include the error correction term (ECT) obtained from the cointegrating relationship, suggesting that the Granger Causality model should be re-parameterized in the equivalent error correction model. Thus, if a cointegrating relationship is established between economic growth and stock market development, Granger causality test will be done in the error correction model as follows:

$$\Delta LnGDP_t = C_1 + \rho_1 e_{t-1} + \sum_{i=1}^{P} \alpha i \ \Delta LnGDP_{t-i} + \sum_{i=1}^{P} \beta i \ \Delta LnGSE_{t-i} \quad (2)$$

$$\Delta GSE_t = C_2 + \rho_2 et_{-1} \ \sum_{i=1}^{P} \alpha i \ \Delta GSE_{t-i} + \sum_{i=1}^{P} \beta i \ \Delta LnGDP_{t-i} \quad (3)$$

Where $\Delta LnGDP_t$ represents change in natural logarithm of *GDP* at time t, C is the constant term; et_{-1} is the error correction term representing the long-run relationship between economic growth and stock market development; ρ measures the sensitivity of the error correction term; α and β represent sensitivity of *GDP* and GSE; $\Delta LnGDP_{t-i}$ and $\Delta LnGSE_{t-i}$ represent lagged change in GDP and *GSE* respectively. A negative and significant coefficient of the error correction term indicates that there is a long-run causal relationship between stock returns and economic growth. If the coefficient of et_{-1} is negative and significant in both equations it means there is a bi-directional causality. If, for example, only ρ_1 is significant, it indicates a unidirectional causality from stock market development to economic growth, implying stock market development drives economic growth toward

long-run equilibrium but not the other way around (Ahmad & Husain, 2007).

3. Results

Table 1 displays the results of the ADF and PP unit root tests. As can be observed, economic growth and stock market development are stationary at their difference forms. Since economic growth and stock market development are I (1) variables, we perform cointegration using ARDL and Johansen Trace test and Maximum Eigenvalue cointegration analyses. Lag length of VAR model is selected at 1 on the basis of Akaike Information Criterion (AIC), Schwarz information criterion, Final Prediction Error, Hannan-Quinn Information criterion and sequential modified LR test statistic. The results of the cointegration test using ARDL and Johansen Trace and Maximum Eigenvalue approaches are reported in Tables 3 and 4. In Table 2, it is observable that the F-statistic exceeds the upper critical bound value at 1% significance level. We, therefore, conclude that there is a long-run relationship between economic growth and stock market development. This is confirmed by the results in Table 3 which indicate that there is one cointegrating relationship between economic growth and stock market development.

Table 1. ADF and PP unit root tests results

ADF Test				PP Test		
Variable	Test Statistic	Lags	Order of Integration	Test Statistic	Bandwidth	Order of integration
LnGDP	-1.241411	3	-	-5.844468	11	-
ΔLnGDP	-9.527810	2	I(1)	-6.508843	9	I(1)
LnGSE	-1.961099	0	-	-1.978362	1	-
Δ LnGSE	-5.286876	0	I(1)	-5.286876	0	I(1)

Table 2. Cointegration test: dependent variable: ΔLnGDP

	Critical value bounds of the F-statistics					
F-Statistic	**1% Level**		**5% Level**		**10% Level**	
10.56824	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
	6.84	7.84	4.94	5.73	4.04	4.78

Table 3. Johansen trace test and maximum eigenvalue test for cointegration

Hypotheses	Trace Test	5% Critical value	p-value	Hypotheses	Eigenvalue	5% Critical Value	p-value
R=0	21.81657	15.49471	0.0049	R=0	20.82006	14.26460	0.0040
R=1	0.996514	3.841466	0.3182	R=1	0.996514	3.841466	0.3182

Table 4 shows that there is a significant long run relationship between economic growth and stock market development. However, this relationship is negative. The Granger causality analysis results reported in Table 6 indicates that there is a unidirectional causality running from stock market development to economic growth, implying the former Granger-causes the latter to long-run equilibrium. The interpretation of the negative, statistically significant long-run relationship between stock market development and economic growth and the Granger causality test running from stock market development to economic growth is that stock market development undermines economic growth in Ghana. Our finding falls in tandem with the inverse-relationship hypothesis (Devereux & Smith, 1994; Mayer, 1988; Morck et al., 1990a, 1990b) which submits that stock market undermines growth because it stimulates asymmetric information on firms and contributes to a decrease in savings. It could be that the GSE is promoting asymmetric information on firms as well as contributing to a reduction in savings. Another reason could be that the GSE is liquid. Demirguoc-Kunt and Levine (1996) identify three channels through which stock market liquidity can negatively impact economic growth: (1) stock market liquidity increases returns on investment which ultimately undermines savings; (2) greater stock market liquidity abates uncertainty among economic units which may reduce their demand for precautionary savings; and (3) greater stock market liquidity may negatively affect corporate control culminating in the reduction in economic growth.

Our finding suggests that all is not well with the GSE. Previous studies have emphasized the inefficiency of the exchange. For example, a study by Frimpong (2008) has reported that the GSE is weak-form inefficient, meaning it is possible for technical analysts to make abnormal gains from it. Another issue of concern about the

exchange is its size. Since its establishment in 1990, the exchange is yet to record forty firms on its listing portfolio, suggesting that more needs to be done to improve it.

Table 4. Long run analysis results: dependent variable: LnGDP

Variable	Coefficient	t-statistic	p-value
Constant	5.1363	3.5042	0.0017***
$LnGDP_{t-1}$	0.4892	3.3380	0.0026***
$LnGSE_{t-1}$	-0.0838	-2.3762	0.0251**

Note. ***, ** and * represent 1%, 5% and 10% significance levels respectively. Adjusted R^2 =0.59 F-statistic = 21.07244, 0.000004.

Table 5 reports the results of the short-run analysis. As can be observed, there is no significant short-run relationship between stock market development and economic growth. This suggests to us that a change in stock market development does not have any significant impact on the economy of Ghana in the short run.

Table 5. Results of vector error correction analysis: dependent variable: Δ*Ln*GDP

Variable	Coefficient	t-statistic	p-value
Constant	-0.0058	-0.2546	0.8012
$\Delta LnGDP_{t-1}$	1.0738	3.9224	0.0006***
$\Delta LnGSE_{t-1}$	-0.0946	-1.6386	0.1143
ECT	-1.5212	-4.6957	0.0001***

Note. ***, ** and * represent 1%, 5% and 10% significance levels respectively. Adjusted R^2 =0.42, F-statistic = 7.474572; prob. 0.001061.

Table 6. Granger causality tests in vector error correction mode

Results of Equation 3-Dependent Variable: LnGDP				**Results of Equation 4-Dependent Variable: LnGSE**			
Variable	Beta	t-statistic	p-value	Variable	Beta	t-statistic	p-value
Constant	0.0082	0.3683	0.7159	Constant	0.0505	-0.6518	0.5207
et_{-1}	-0.7775	-4.6886	0.0001***	et_{-1}	-1.0309	-1.7788	0.0879
ΔLnGDP-1	0.3304	1.9862	0.0585**	ΔLnGSE-1	-0.1341	-0.6659	0.5118
ΔLnGSE-1	-0.0918	-1.5931	0.1242	ΔLnGDP-1	0.4893	0.8417	0.4083
N=28, Adjusted R^2=0.48				N=28, Adjusted R^2=0.009			

Note. ***, ** and * represent 1%, 5% and 10% significance levels respectively. Adjusted R^2 =0.42, F-statistic = 7.474572; prob. 0.001061.

4. Conclusion

The study explores whether stock market development promotes economic growth with quarterly data from Ghana. It employs bounds testing approach to cointegration and Granger Causality test in the vector error correction model. The analysis shows that there is a long run cointegrating relationship between stock market development and economic growth. The granger causality test demonstrates that there is a unidirectional causality running from stock market development to economic growth in Ghana. Our results also show that there is a negative, statistically significant long-run relationship between stock market development and economic growth. We, therefore, conclude that stock market development does not promote economic growth in Ghana.

The main policy implication of our findings is that the GSE requires reforms to become relevant to the growth process of Ghana. Policymakers should focus on how to improve the efficiency of the exchange. This can be achieved by increasing the transparency of the exchange which will facilitate effective dissemination of information to market participants. Another area of the exchange that calls for reforms is its size. The size of the exchange is significantly small. Maybe eliminating the not-too-significant listing requirements will induce more firms to consider getting listed on the exchange which will help improve its size with possible concomitant positive contribution to the growth process of the Ghanaian economy.

The paper suffers from some weaknesses. One of these weaknesses is the length of the study period. The study has used quarterly data spanning from 2006 to 2010. Usually for more robust results, longer time series data are essentially needed. Another weakness of the paper is its bivariate design which makes it suffer from

omission-of-variables syndrome. Besides, our reasons for the negative contribution of the GSE to economic growth have been speculative. We, therefore, recommend that future research should explore the factors that account for GSE's negative impact on the economic growth of Ghana.

Notwithstanding these weaknesses, the study has set the agenda for more intellectual debate on the contribution of the GSE to the growth of the Ghanaian economy. It is our expectation that the intellectual debate will help shape the current configuration of the GSE for more effective and efficient operations.

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