Original Research Paper

West African Emerging Economies: Comparative Insights on Ghana's and Nigeria's Stock Market Development

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Abstract: The study examines the long-run and causal relationship between stock market development and West African emerging economies in a comparative context of Ghana and Nigeria. Based on Autoregressive Distributed Lag (ARDL) bounds test approach, the findings support the evidence of long-run cointegration between stock market development and economic growth in Ghana, whereas further evidence reveals an insignificant positive long-run impact on economic growth. In contrast, there is no long-run cointegration between stock market indicators and economic growth in Nigeria. Furthermore, in the context of the Vector Error Correction Model (VECM) and Vector Autoregressive model (VAR) for Ghana and Nigeria respectively, the Granger causality test indicates that the direction of causality only runs from economic growth to stock market development, unidirectional) in both countries. Nonetheless, the empirical evidence on growth-led finance is specifically feeble in Nigeria. Given these results, the paper posits that stock markets could well play a crucial role in stimulating growth in West Africa. However, to attain this goal, there is a need to launch reforms that entail the overhaul of the legal and regulatory framework as well as principles underlying effective supervision. Also, Ghana and Nigeria should ensure that the stock markets are properly integrated into their respective economies and the strong integration of the two markets through robust institutional and governance structures. These could thus foster the development of stock markets in the two countries.

Keywords: ARDL, Economic Growth, Stock Market Development, Ghana, Nigeria, West Africa

Introduction

The burgeoning interest in the importance of the stock market in modern economies has reinforced the growing notion that finance is paramount to economic growth. This has necessitated the need for the novel and emerging debate on the theoretical exposition reflecting the increased importance of stock market development in developing economies. The empirical discovery has pervasively espoused the critical role of an efficient financial system in the economic development process (Schumpeter, 1912; Levine and Zervos, 1998; Odhiambo, 2007). It is argued that the stock market and financial intermediaries allow for effective trading, pooling of resources, and risk diversification and thus enhance economic growth. Moreover, efficient stock markets could minimize the cost of information through the generation and spreading of specific information of firms

thereby engendering effective allocation of resources. Specifically, financial sector development is mostly viewed as the hub and harbinger of improved economic performance (Naceur and Ghazouani, 2007; Wachtel, 2003; Rioja and Valev, 2004; Wait *et al.*, 2017).

Attaining economic growth has been the central component of the development initiatives of many sub-Saharan African countries over the years (Nafziger, 2007). The major policy measures have been centered on strengthening macroeconomic performance; enhancing financial sector performance, and human capital, and improving the business environment. Specifically, in West African countries, the two leading economies (Ghana and Nigeria) (Ghana and Nigeria are anglophone countries with similar colonial origins. It is believed that this could have a great impact on the extant rules and regulations and the bilateral relationship between the two countries.), whilst incorporating IMF policy recommendations, have been

pursuing various economic reforms. Accordingly, Ghana's economy has experienced a substantial improvement through a quarter-century firm fiscal reform program resulting in relatively strong management, sustained improvements in the standard of living, and a competitive business environment, whereas Nigeria's economic progress (For instance, Nigeria has a poor regulatory environment coupled with a high level of inefficiency across all sectors of the economy. This has constituted a downright impediment and retardation to the economic development process. Over the years, despite efforts made by successive governments to address these institutional deficiencies, there has been no appreciable improvement) which has been hampered by poor macroeconomic management, socio-economic problems, and inadequate infrastructure. However, in terms of Growth Performance (GDP), in 2017, Ghana was ranked 80th with $40.71 billion, whilst Nigeria was ranked 37th (6 times above Ghana) with $262.61 billion (NationMaster, 2018). Overall, assessing the two economies, despite that their average capitalization is lower than most emerging markets (Fig. 1) (The average value of Ghana's stock market capitalization between 1991 and 2013 based on available data was 13.51%, whilst the minimum and maximum values for the period were 1.15 and 34.33% respectively (Fig. 1)), in the African context, both countries have relatively developed stock markets (KPMG, 2017). Hence, having more understanding of the role of the two markets in economic growth is paramount and vital for boosting the economic performance of the West African sub-region.

Considering the stock market as a catalyst for economic growth, in 1989, Ghana's stock market was established, but it started operation in 1990. Since its inception, it has been developing at a speedy pace and became completely automated in 2008. Ghana's Stock Exchange (GSE) had 50% growth in 2017, whilst out of the 38 listed companies, 19 recorded gains (Moore, 2018). The rapid expansion of GSE has influenced economic development in different ways such as enhancing domestic savings and the level of investment (Kumo, 2009). Regarding the Nigerian Stock Exchange (NSE), it was established in 1960, but the operation started in 1961. NSE introduced an automated trading System in 1999 to strengthen its operation. However, with about 200 listed companies and 258 securities listed, compared to developed countries, NSE is still shallow (Oteh, 2014), although, in terms of total market capitalization which was estimated at N8.5 trillion in 2017, NSE is the largest in West Africa (NSE, 2018) (The average value of Nigerian stock market capitalization between 1991 and 2013 was 14.14%. The lowest and highest values were 4.16 and 51.88% respectively (Fig. 1). Generally, gauging the West African stock market's efficiency, they are characterized by many market imperfections which include; small size, weak regulatory system, low liquidity, and asymmetric information. These pervasive phenomena greatly undermine the efficiency and effectiveness of financial markets in the sub-region (Massa, 2009).
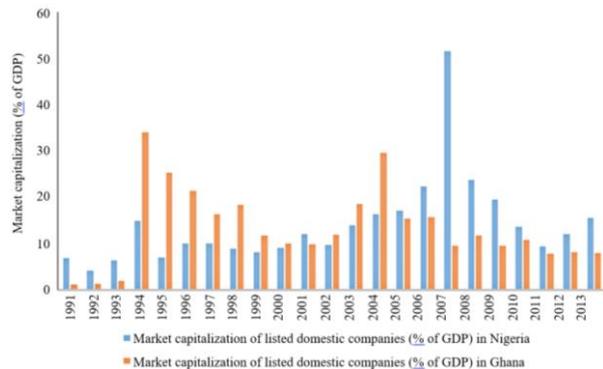

Fig. 1: Ghana and Nigeria-Market capitalization of listed domestic companies (% of GDP); Source: World Development Indicator (WDI), 2017 and Author's Computation

Ghana and Nigeria continue the rapid integration of their economies with the global marketplace, whereas getting the most two active markets in West Africa integrated is critical (Agyapong, 2014). There have been time series studies for both Ghana and Nigeria on the stock market-economic growth nexus (Acquah-Sam and Salami, 2014; Osei, 2006; Owusu and Odhiambo, 2014) for Ghana, (Adigwe et al., 2015; Ovat, 2012; Olowe et al., 2011) for Nigeria. Hence, there is a need for a comparative analysis of these two leading markets in West Africa driven by the growing debate on the fledgling state of West African stock markets coupled with the implications for the sub-region's emerging economies which are worrisome. The question is: Based on the finance-growth nexus, would there be any improvement in the economies of the sub-region given the dramatic melioration of the two markets?

In the literature, Panel and comparative analyses have been conducted for sub-Saharan Africa (Enisan and Olufisayo, 2009; Yartey, 2007), Nigeria and South Africa (Osakwe and Ananwude, 2017), Euronext countries (Ake and Dehuan, 2015), BRICS and Non-BRICS economies (Wait et al., 2017), Turkey and BRICS economies (Ali, 2015), Ghana, Kenya and Nigeria (Osamwonyi and Kasimu, 2013) and for West African Economic and Monetary Union (Fantessi and Kiprop, 2015). However, comparative empirical analysis of Ghana and Nigeria is limited. Thus, comparing the effect of the two stock markets (Ghana and Nigeria) on economic growth could offer a new opportunity to West African policymakers.

Because of the foregoing, the objective of this study is to analyze the long run and causal relationship between stock market development and economic growth, in a comparative context of Ghana and Nigeria using ARDL bound test and Granger causality test based on Vector Error Correction Model (VECM). It is believed that this approach will help to eliminate the problem commonly associated with the use of

short time series data. This study contributes to the empirical literature on the relationship between stock market development and economic growth through a comparative analysis of the leading economies in West Africa: Ghana and Nigeria. Moreover, we are of the view that the study could give strong leverage for enhancing the integration and harmonization of the two markets. This is crucial considering the state of West African stock markets.

The paper is organized as follows. Section two briefly summarizes the theoretical and empirical literature.

Theoretical Review

The foremost theoretical proposition in the literature that financial development is the harbinger of economic growth was first initiated by Schumpeter (1912). It is argued that financial sector development is paramount to economic performance. Consequently, several other studies gave much attention to the role of financial market development in the economic development process. To achieve a high level of economic growth, there is a common consensus that financial development is a necessary condition and more specifically effective and well-coordinated financial intermediaries have a crucial influence on economic growth (King and Levine, 1993; Mckinnon, 1973; Levine, 1997; Shaw, 1973; Levine and Zervos, 1998). This is based on the argument that the level of financial intermediation can be a strong predictor of capital accumulation, productivity increase, and economic growth. In addition, they are of the view that the selection of the right firms (entrepreneurs) who have the good business initiative for forming successful ventures by banks will promote the level of technological innovation in any economy (Most of the references are obtained from (Chandavarkar, 1992) expository and detailed discussion of finance and economic development).

From the theoretical perspective, the finance-growth nexus is commonly categorized into two, which include the 'Supply-leading' and 'Demand-following'-role, suggesting that in some economies, it is financial development that stimulates economic growth whilst the reverse holds in other economies (Patrick, 1966). According to the author, the direction of a causal relationship between economic growth and financial development changes in line with development. The demand-following incentives will be more significant and dominant when economic growth begins to accelerate. However, the supply-leading hypothesis will become less and less significant gradually (Robinson, 1952; Stern, 1989). This view stresses that the demands for various new financial services happen when the real sector of the economy improves and these will be met by the seeming passive response from the financial sector. The effective allocation of scarce resources

through the financial sector, concerning the relative rate of return, spurs and stimulates the growth of the real sector (Odhiambo, 2007).

More specifically, the mitigation of corporate governance problems by banks, with reduced monitoring costs can automatically lessen credit rationing and in turn enhance economic growth (Bencivenga and Smith, 1993). In another way, financial systems encourage any economic agent to hold highly risky projects through a diversified portfolio, in such economies, people will be spurred to approach projects with higher rates of expected returns (Greenwood and Jovanovic, 1990). As a consequence, the rate of economic growth will be accelerated. This is the strong reason stock market and financial intermediaries allow for effective trading, pooling of resources, and risk diversification in most economies (Naceur and Ghazouani, 2007). They also argue that economic development can be affected by financial systems that promote savings mobility given inducing instruments and saving approaches. In their findings, there is a positive relationship between banking development and economic growth.

Another prominent view called the 'feedback' hypothesis indicates that a bi-directional association exists between financial sector development and economic growth, whilst the essence of the connection depends on the level of economic development. The protagonists of this postulation posit that highly improved economic performance resulting from technological advancement, products, and innovative services is facilitated by a well-developed and functioning financial system (Schumpeter, 1912). Hence, the expansion of the economy will cause high demand for financial instruments and other financial services (Levine, 1997). Moreover, the positive interdependence of both financial development and economic growth and their relationship could be regarded as feedback causality (Luintel and Khan, 1999). In general, the level of economic growth might be determined by such factors as market capitalization, liquidity, financial sector efficiency, and governance system as well as environmental quality.

Empirical Review

In the wake of humongous empirical evidence, considerable research efforts have been centered on the finance-growth nexus. This has given the need for several emerging and interesting details on how financial development evolved and in particular the influence of stock market development on economic growth. The empirical literature has established that a substantial association exists between stock market development and economic performance in most economies (Rajan and Zingales, 1998; Mauro, 2000; Levine and Zervos, 1998). Regarding development discourse, economic growth is gaining increased prominence; hence delving into the

finance-growth nexus has grown considerably. Thus, a good number of studies have established the substantial role of stock market development in the economic growth process. These include (Spears, 1991; Levine, 1991; Wachtel, 2003; Trabelsi, 2002; Rioja and Valev, 2004; Wait *et al*., 2017); Paudel 2005; Akinlo, 2003; Adjasi and Biekpe, 2006) among others. Specifically, (Mohtadi and Agarwal, 2001), based on the panel approach, posit that by indirectly boosting private investment behavior, there is a positive relationship between the stock market performance and economic growth in 21 emerging markets investigated.

Based on a comparative analysis, (Wait *et al*., 2017) used the Generalized Method of Moments (GMM) and an extended endogenous growth model to examine the effect of a set of financial market indicators on economic growth. In comparison with non-BRICS emerging economies, empirical findings show that financial market openness contributes to BRICS economies in terms of higher economic growth trajectories. They further argue that credit to the private sector and financial depth in the BRICS economies enhance higher levels of economic performance across BRICS countries compared to non-BRICS economies. Another study on Euronext countries (Belgium, France, Portugal, Netherlands, and United Kingdom) for the period 1995: Q1 to 2008: Q4, (Ake and Dehuan, 2015) using the Granger causality test reveal that there is no causal relationship between stock market development and economic growth in countries that have small and less liquid stock market whilst in countries with the highly active liquid stock market, a positive link exists between the stock market and economic growth. In their study, they use three proxies for the stock market: Market capitalization, total trade value, and turnover ratio. Similarly, (Ali, 2015) examines stock market development and economic growth in Turkey and BRICS Countries. The author argues that in Russia, India, and China, stock market development has a positive significant effect on economic growth. Furthermore, on the causality connection, for Russia, India, Turkey, and South Africa, stock market development granger causes economic growth whilst for Brazil and China the causal direction runs from economic growth to stock market development through inducing liquidity. Moreover, focusing on both Nigeria and South Africa (a comparative analysis), (Osakwe and Ananwude, 2017) following ARDL co-integration approach posit that there is a positive insignificant association between stock market development and economic growth in both countries (Nigeria and South Africa). Based on granger causality results, although Nigerian economic growth is not significantly affected by market capitalization (size), it is deduced that the South African economy is significantly influenced by market capitalization.

More importantly, because the stock exchange of the West African monetary union is relatively new compared to many countries across the world, (Tachiwou, 2010) examines the impact of stock market development on economic growth in the region. Using a time series data set

(1995-2006) both the short-run and long-run relationships are investigated through Error Correction Model (ECM), he suggests that stock market development has a positive effect on economic growth in West African monetary union both in the short run and long run. Similarly, (Yartey, 2007) find mixed evidence on the relationship between stock market development and economic growth in sub-Saharan African countries. Using the difference General Moment Method (GMM), they find that stock market value traded seems to be positively and significantly associated with economic growth whilst other measures of stock market development such as market size and turnover ratio give negative coefficients. The results of these authors, however, show that the stock markets have contributed to the financial growth of large corporations in certain African countries.

In another relevant effort for the West African Economic and Monetary Union (WAEMU), (Fantessi and Kiprop, 2015) also made use of GMM to explore the relationship between financial development and economic growth. Using data set between 1981 and 2010, they find a positive and statistically significant influence of financial development on economic growth and the causality is bidirectional. Agyapong (2014) investigates whether stock markets in the West African monetary zone are integrated. In the study, both linear and nonlinear cointegration methods were adopted, and whilst the results from the linear cointegration indicate that the only active stock markets (i.e., Ghana Stock Exchange and Nigeria Stock Exchange) in the region are not integrated, the linear method shows a weak sign of integration.

In country-specific studies, (Magweva and Mashamba, 2016) using the Vector Error Correction Model approach (1989 to 2014) examine the relationship between stock market development and economic growth in Zimbabwe. Empirical results show a negative long-run relationship between the stock market and economic growth and the short-run coefficients are found to be insignificant. However, a study on Egypt (2002-2013), (Osama, 2015) applying Vector Autoregressive estimates (VAR) concludes that there is a direct link between stock market development and economic growth. Focusing on Nigeria, (Adigwe *et al*., 2015) using the OLS technique reveal that although stock market development has not contributed significantly to Nigerian economic growth, the stock market has the potential to induce economic growth in the country. Accordingly, (Ovat, 2012), also on Nigeria, whilst suggesting the relevance of market liquidity over market size, stresses that the strength of the causal relationship runs more from stock market liquidity to growth. Moreover, the findings reveal that market size has no effect or little influence on economic growth. The study conducted by Baboo and Odit (2009) explores the effect of stock market development on economic growth in Mauritius between 1989 and 2007. The author argues

that stock market development influences economic growth in Mauritius both in the long run and short run.

Also, (Acquah-Sam and Salami, 2014) examine the effect of capital market development on economic growth in Ghana. Structural Equation Modeling (SEM) through Path Analysis was employed to explore the causal direction between GDP growth and capital market development, as well as other causal effects in their model. They reported that GDP growth is linearly related to capital market development. Specifically, there is a positive bi-directional relationship between economic growth and capital market development albeit the stronger effect is from capital market development to economic growth. Similarly, (Osei, 2006) investigates both the long-run and the short-run relationships between Ghana's stock market and economic growth and concludes that there is cointegration between the macroeconomic indicators and the Ghana stock market. In addition, the author finds that the evidence of cointegration and short-run dynamic analysis suggests that there are both long-run and short-run relationships between economic growth and the stock market index in Ghana. Using the ARDL-bounds testing approach and multidimensional stock market development proxies to examine this linkage, (Owusu and Odhiambo, 2014) finds that in the long run, stock market developments and capital account liberalization policies have no positive effect on economic growth in Ghana.

Given the significance of the causality nexus for the relationship between economic growth and stock market development, (Enisan and Olufisayo, 2009) find some mixed results among the seven African countries selected. The findings show that in Egypt and South Africa, there is a unidirectional causality running from stock market development to economic growth. In contrast, Cote D'Ivoire, Kenya, Morocco, and Zimbabwe, find bidirectional causality between stock market development and economic growth. In addition, the study also reveals that stock market development has a positive significant long-run effect on economic growth, whilst in Nigeria, using market capitalization as an indicator of stock market development, there is weak empirical evidence of growth-led finance. In the work of (N'Zué, 2006; Deb and Mukkherjee, 2008; Filer *et al*., 2000; Bist, 2017), findings show that there is unidirectional causality from stock market development to economic growth. However, in countries with less liquid and small stock markets, the causality relationship does not exist (Ake, 2010). Also, (Osamwonyi and Kasimu, 2013) investigate the causal association between stock market expansion and economic growth in Ghana, Kenya, and Nigeria between 1989 and 2009. Their findings indicate that there is no causal connection between stock market development and economic growth in Ghana and Nigeria but there is bi-directional causality in Kenya. On feedback effect, a group of researchers (Apergis *et al*., 2007; Eslamloueyan and Sakhaei, 2011; Pradhan, 2009; Shahbaz *et al*., 2008)

conclude that there is bi-directional causality between stock market development and economic growth in economies with high liquid and the stable stock market.

In summary, from the empirical review, it is commonly found that in countries with small (size) and less liquid stock markets, bi-directional causality does not exist between stock market development and economic growth. However, comparing various findings for developing countries, differences in results might be due to different procedures employed and the time frame. Generally, the empirical literature suggests that the relationship between stock market development and economic growth varies across countries and regions. Moreover, studies regarding comparative analyses have been limited, specifically in the comparative context of Ghana and Nigeria. Hence, considering the leading role of the two markets in the West African sub-region, this study explores the long-run and causal relationship between stock market development and economic growth, all in a comparative context of Ghana and Nigeria. The findings of this study would help to fill the existing gap in the literature.

Materials and Methods

Data

With the intent of examining the long run and causal relationship between stock market development and economic growth in the context of comparative analysis of Ghana and Nigeria, we employ time series data between 1988 and 2016 for Nigeria, whereas data for Ghana cover the period of 1991 to 2013. The choice of scope is determined by the availability of data for our main variable of interest (stock market development indicator) in the model estimated. Specifically, two indicators of stock market development (market capitalization and value traded ratio) were used in the study.

In the study, economic growth is proxied by real GDP per capita (constant 2010 US$) denoted as Y. In measuring stock market development, market size is measured by Market capitalization ratio (MRK), which is the value of listed shares (% of GDP) whilst the liquidity level is measured by Value Traded Ratio (VTR), which shows the total value of shares traded (% of GDP). It is intuitively plausible that other variables could greatly affect economic growth. The causal direction between stock market development and economic growth could be biased by the omission of these variables. Consequently, two control variables (The inclusion of two control variables will aid the analysis, as some studies have shown that there might not be cointegration with the use of only two variables (i.e., in bivariate analysis) whereas cointegration is mostly possible when control variables are incorporated in the model (N'Zué, 2006) were included in the model;

Regulatory Quality (RGQ) and Trade Openness (TRP). The government through the institutional framework can regulate the activities in the financial sector. Thus, regulatory quality is chosen as an institutional and governance tool in adjusting stock market and economic activities. Trade openness is incorporated to reflect the level of the influence of external (global) factors on the economy. Whilst regulatory quality measures the extent of the government's ability to formulate sound policies and regulations, openness represents the ratio of total exports and imports to GDP. Data on economic growth, trade openness, and stock market development indicators were obtained from World Development Indicators (2017 edition), however, that of regulatory quality was obtained from International Country Risk Guide (2017 Edition).

Methodology

The model for this study is based on the supply-leading finance hypothesis (Schumpeter, 1912) and the work of (McKinnon, 1973; Shaw, 1973). Hence, the model is expressed in a functional form:

$$Y = f\left(RGQ, TRP, SMD\right) \tag{1}$$

SMD represents stock market development indicators denoting *MRK* and *VTR* respectively, whilst *Y*, *RGQ*, and *TRP* remain as defined in the previous section.

Given the objective of this study, we adopt the Autoregressive Distributed Lag (ARDL) (For more details about the application and advantages of ARDL, one may consult the work of (Squalli 2007; Pesaran *et al.*, 2001; Narayan and Narayan, 2005; De Vita and Abbot, 2002) among others) bounds test approach proposed by (Pesaran *et al.*, 2001). The choice of this technique is based on its numerous advantages over other cointegration procedures, as it is most suitable for small sample size like we have in the estimated model. Also, whether the regressors are mutually co-integrated, I (0), or I (1), it is applicable, although none should be I (2) and above.

Thus, the ARDL model is stated as:

$$\Delta \ln Y_t = \omega_0 + \sum_{i=1}^{n} \omega_{1i} \Delta \ln Y_{t-i} + \sum_{i=0}^{n} \omega_{2i} \Delta \ln SMD_{t-i}$$
$$+ \sum_{i=0}^{n} \omega_{3i} \Delta \ln RGQ_{t-i} + \sum_{i=0}^{n} \omega_{4i} \Delta \ln TRP_{t-i} + \omega_5 \ln Y_{t-1} \tag{2}$$
$$+ \omega_6 \ln SMD_{t-1} + \omega_7 \ln RGQ_{t-1} + \omega_8 \ln TRP_{t-1} + \varepsilon_t$$

where, *ln* represents the natural logarithms (All variables used in the model are in logarithm form); Δ is the difference operator; ε is defined as the white noise error term whilst *t* is the time period.

Testing the cointegration relationship between the dependent variable (*Y*) and the explanatory variables involves two steps. The first step, Eq. 2 is estimated by the Ordinary Least Squares (OLS) method. The second step involves tracing the presence of cointegration by restricting all estimated coefficients of lagged-level variables such that they are equal to zero. That is, null hypothesis; H_0: $\omega_5 = \omega_6 = \omega_7 = \omega_8 = 0$ against the alternative hypothesis; H_1: $\omega_5 \neq \omega_6 \neq \omega_7 \neq \omega_8 \neq 0$. We do not reject the null hypothesis of no integration if the computed F-statistics is less than the lower bound critical value. But we reject the null hypothesis if computed F-statistics is greater than the upper bound critical value; in this case, steady-state equilibrium is said to exist between the variables in the estimated model. However, there will be an inconclusive result, if the computed value falls between the bound. There is an error correction representation when the long-run relationship exists among the variables. Thus, the Error Correction term is obtained through the estimated equation, and then the short-run dynamics are investigated by estimating the Vector Error Correction Model (VECM) (In the literature, it has been pointed out that if cointegration does not exist in the estimated model (i.e., if the results of ARDL show that there is no cointegration between stock market development and economic growth), Vector Autoregressive model (VAR) should be better estimated in lieu of Vector Error Correction Model (VECM); for insightful and detailed evidence see (Enisan and Olufisayo, 2009). Although the existence of cointegration implies that there is Granger causality in at least one direction, it does not show the direction of causality. Hence the causality relationship between stock market development and economic growth is examined by conducting the Granger causality test in the VECM framework; which can be expressed (Engle and granger, 1987) for detailed discussion and elucidation of this method):

$$\Delta \ln Y_t = \alpha_0 + \sum_{i=1}^{k1} \beta_{1i} \Delta \ln Y_{t-i} + \sum_{i=0}^{P} \beta_{2i} \Delta \ln SMD_{t-i}$$
$$+ \sum_{i=0}^{P} \beta_{3i} \Delta \ln RGQ_{t-i} + \sum_{i=0}^{P} \beta_{4i} \Delta \ln TRP_{t-i} + \partial_i ECT_{t-1} + \varepsilon_{1t} \tag{3}$$

$$\Delta \ln SMD_t = \varnothing_0 + \sum_{i=1}^{k2} \varnothing_{1i} \Delta \ln SMD_{t-i} + \sum_{i=0}^{P} \varnothing_{2i} \Delta \ln Y_{t-i}$$
$$+ \sum_{i=0}^{P} \varnothing_{3i} \Delta \ln RGQ_{t-i} + \sum_{i=0}^{P} \varnothing_{4i} \Delta \ln TRP_{t-i} + \varphi_i ECT_{t-1} + \varepsilon_{2t} \tag{4}$$

$\Delta \ln Y_{t-i}$, $\Delta \ln SMD_{t-i}$, $\Delta \ln RGQ_{t-i}$, and $\Delta \ln TRP_{t-i}$ measures the short-run dynamics of the model. Meanwhile, *ECT* captures both speeds of adjustment to equilibrium and long-run relationships. It is notable that the significance of the t-statistics on the coefficients (∂ and ϕ) of *ECT*, which have to be negative (The negative sign of the

coefficients of *ECT* suggests that, after a shock in the short-run, the dependent variable (*Y*) adjusts back to its equilibrium value.), indicates long-run causal effect and if both coefficients of the *ECT* are statistically significant, bi-directional causality between economic growth and stock market development is said to exist. However, if only one coefficient is negative and significant, it indicates unidirectional causality running from stock market development to economic growth and vice versa.

Empirical Results and Discussion

Considering the non-stationary nature of most time series data, the analysis encompassed the test of unit roots to justify the suitability of econometric techniques employed in the study. Accordingly, none of the variables used was found to be 1(2) or above as indicated in Table 1. Hence, applying ADRL bounds tests is theoretically and empirically tenable. Given this, the computed *F*-statistics based on the results shown in Table 2 (The CUSUM and CUSUMSQ lie within the critical boundaries, which are available upon request, suggesting that, in each model, the ARDL model coefficients are stable) of the bound test for cointegration analysis and elasticity of growth function, the null hypothesis of no cointegration with strong evidence was rejected at 5% significance level for Market Capitalization Ratio (MRK) and 1% significance level for Value Traded Ratio (VTR) for Ghana (Ghana - Diagnostic test (model 1): Ramsey reset test = 0.36; Normality test = 2.17; Serial correlation = 0.69; Diagnostic test (model 2): Ramsey reset test = 0.43; Normality test = 0.37; Serial correlation = 0.82) only. This simply suggests that the computed *F*-statistics for the two models exceeded 5 and 1% upper bounds respectively. In addition, both stock market development indicators have an insignificant positive impact on Ghana's economy in the long run. Overall, since they are not statistically significant to explain economic growth, it could be concluded that both market capitalization and value traded ratio do not contribute to Ghana's economy.

However, for Nigeria (Nigeria-Diagnostic test (model 1): Ramsey reset test = 0.58; Normality test = 0.17; Serial correlation = 0.59; Diagnostic test (model 2): Ramsey reset test = 0.54; Normality test = 0.33; Serial correlation = 0.58), even at 10% significant level, given the computed *F*-statistics, the null hypothesis of no cointegration between two stock market development indicators and Nigerian economy could not be rejected. In the two models, the computed *F*- statistics were below the lower critical bound at all levels of significance. Thus, it could be said that there is the nonexistence of a long-run relationship between two stock market development indicators and economic growth in Nigeria. By implication, the supposed impact and delink between the growth of the Nigerian economy have been hampered by

factors impeding the efficiency and effectiveness of the financial sector to attract a substantial level of investment and induce investors' confidence. More specifically, the indirect link between the stock market and other sectors that have considerable influence on economic growth has remained significantly ineffective. Besides, the findings from the ARDL bounds test for Nigeria that there is no long-run association between stock market development and the country's economy coupled with the suggestive assertions are strongly in consonance with the findings of (Enisan and Olufisayo, 2009) for seven sub-Saharan African countries, (Ovat, 2012) for one country, (Osamwonyi and Kasimu, 2013) for three African countries, (Magweva and Mashamba, 2016) for one country.

On the control variables (regulatory quality and trade openness), for Ghana, they are also not statistically significant (In both countries, the lack of significant long-run relationship between regulatory quality, trade openness, and economic growth could be said to be as a result of pervasive weak institutional quality in African countries and the over-dependence on imported goods; import usually outweighs export, particularly in West African countries. As such they might not be important factors in explaining economic growth in these economies). Generally, the long-run relationship among the variables, specifically the stock market development and Ghana's economy is quite in line with the findings of (Adjasi and Biekpe, 2006) for 14 African countries; (Osei, 2006) for one country; and (Acquah-Sam and Salami, 2014) also for one country. In comparison, the existence of cointegration between stock market development and economic growth of Ghana, unlike Nigeria, could be linked to consistently improving the institutional framework and sustained drive towards enhancing financial sector performance for attaining a competitive business environment, which has stimulated public investment decisions (Owing to the sustained policy reform, Ghana has outperformed most West African countries on measures of macroeconomic indicators). Nonetheless, it could be posited that there is the existence of an insignificant positive long-run association between the development of stock markets and economic growth in the two countries (The insignificant long-run association between the development of stock markets and economic growth in both Ghana and Nigeria could be attributed to the shallow and tiny (small) state of stock markets in most African countries coupled with the weak level of integration of Africa's stock markets into their respective economies and the inability of the financial sector to complement other critical sectors of their economies (Jacqueline, 2000). Besides, putting the two economies together by world standards, they are small and their contribution to world market capitalization is still below 1% (World Bank, 2018). Accordingly, the two stock markets might have constrained influence on their respective economies).

Table 1: Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root test results

Country	Variable	Augmented Dickey-Fuller	Phillips-Perron
Ghana	GDP(Y)		
	Level	-2.38	-1.85
	First difference	-4.88(2)***	-16.97***
	Capitalization (MRK)		
	Level	-3.01(0)**	-3.01**
	First difference	-5.33 (0)***	-5.33***
	Value traded (VTR)		
	Level	-4.38 (1)***	-4.75***
	First difference	-5.50 (1)***	-9.71***
	Reg Quality (RGQ)		
	Level	-3.61(1)**	-1.92
	First difference	-3.85(3)***	-2.91**
	Openness (TRP)		
	Level	-2.92 (2)**	-2.22
	First difference	-4.03 (1)***	-4.08***
Nigeria	GDP(Y)		
	Level	-0.09(0)	-0.10
	First difference	-3.93(0)***	-3.93***
	Capitalization (MRK)		
	Level	-2.73(0)**	-2.68**
	First difference	-6.77(0)***	-7.08***
	Value Traded (VTR)		
	Level	-2.82(1)**	-2.22
	First difference	-5.13(1)***	-5.24***
	Reg Quality (RGQ)		
	Level	-2.21(0)	-2.23
	First difference	-6.47(0)***	-6.48***
	Openness (TRP)		
	Level	-0.91(2)	-2.03

**and ***indicated the level of significance at 5 and 1% respectively. Figures in (.) represent the lag length selected by the AIC criterion. The PP length was selected by Newey-West Band Width

Table 2: Bound test for cointegration analysis and elasticity of growth function in Ghana and Nigeria

	Model 1				Model 2			
			The estimated coefficient				Estimated coefficient	
Country	F-Statistics	Variable	Long run	Short run	F-Statistics	Variable	Long run	Short run
Ghana	5.13**	MRK	0.03	-0.002	7.28***	VTR	2.11	1.700
		RGQ	0.19	-0.020		RGQ	1.12	-1.560
		TRP	-0.04	0.002		TRP	0.03	-0.004
Nigeria	1.21	MRK	-1.79	1.270	1.18	VTR	1.68	2.970
		RGQ	0.43	1.440		RGQ	2.28	1.380
		TRP	-2.21	-2.170		TRP	-0.34	-2.430
Critical values (%)[a]			Lower bound				Upper bound	
	10.00		2.270				3.77	
	5.00		3.230				4.35	
	1.00		4.290				5.61	

***and** indicated the level of significance at 1 and 5%; α Source: Pesaran *et al.* (2001): Unrestricted intercepts and no trend

Table 3: Granger causality results based on VECM

		Stock market dev-led growth			Growth-led stock market dev		
Country	Lag	Variable	Short run[a]	ECT[β]	Variable	Short run[a]	ECT[β]
Ghana	1	MRK	0.07	-0.002 (-0.21)	Y	20.65***	-1.75** (-5.47)
		RGQ	0.74		RGQ	10.37**	
		TRP	0.07		TRP	2.41*	
	1	VTR	0.07	-0.04 (-1.04)	Y	2.22*	-0.89** (-3.47)
		RGQ	0.53		RGQ	1.92	
		TRP	0.15		TRP	0.10	

[a]The Wald statistic is reported, which tests the joint significance of the lagged values of the variables. It follows an x^2 distribution.
[β]figures in parenthesis are t-statistic. (***), (**) and (*) indicated the level of significance at 1, 5, and 10%

Table 4: Granger causality results based on the Vector Autoregressive model (VAR)

Country	Lag	Stock market dev-led growth		Growth-led stock market dev	
		Variable	Short run[a]	Variable	Short run[a]
Nigeria		MRK	1.46	Y	2.43*
	1	RGQ	3.85**	RGQ	1.11
		TRP	3.88**	TRP	2.30*
		VTR	0.01	Y	1.05
	1	RGQ	3.95**	RGQ	0.16
		TRP	3.72**	TRP	1.22

[a]The Wald statistic is reported, which tests the joint significance of the lagged values of the variables. It follows a x^2 distribution.
(***), (**) and (*) indicated the level of significance at 1, 5, and 10%

The existence of cointegration in Ghana's case implies that there is good evidence of a long-run relationship among the variables, which implies that Granger causality should at least come from one direction (Engle and Granger, 1987). Thus, according to (Engle and Granger, 1987), the presence of cointegration is always accompanied by error correction representation which suggests that any change in the dependent variables is determined by the disequilibrium state in the cointegration relationship and it is accounted for by changes in other explanatory variables and the Error Correction Term (ECT). Consequently, Equations 3 and 4 are estimated to explore the possibility of long and short-run causal direction among these variables. In the case of Ghana, the causality association between stock market development and economic growth is presented in Table 3. The results (Table 3) indicate that the Wald test statistics are insignificant for market capitalization and value traded ratio under stock market dev-led growth, whereas it is significant for real GDP under growth-led stock market development at 1 and 10% significance levels respectively. This implies that the null hypothesis that real GDP does not Granger cause stock market development in the short run is rejected at 1% (for MRK) and 10% (for *VTR*) in support of the growth-led stock market development hypothesis (This has provided support for the findings of (Robinson, 1952; Stern, 1989) in that finance is caused by economic growth) in Ghana's case. However, in line with stock market dev-led growth, there is no evidence in favor of it in the case of Ghana. This suggests that the causal direction between economic growth and stock market development is unidirectional, which runs from economic growth to the development of the stock market for Ghana.

Moreover, when the market capitalization ratio was used as an indicator of stock market development, economic growth does Granger cause both regulatory quality and trade openness at 5 and 10% levels of significance respectively. This finding corroborates the results obtained by Ali (2015) that changes in market development are Granger caused by changes in economic growth for Brazil and China. The results reveal that, based on the lagged dynamic terms, future changes in the level of stock market development would be in part induced by changes in the economic growth of Ghana in the short run. That is, a rapid growth rate, specifically in the real sector, through structural transformation stimulates a higher level of stock market development. Also, by the adjustment of the error correction terms, real GDP has a crucial influence on the development of the stock market. This finding implies that stock market development would be enhanced by policy measures adopted to further boost macroeconomic performance and promote private sector competitiveness. Furthermore, the results suggest that the decrepit regulatory and supervisory environment and the rampancy of weak risk management systems in West African markets could imperil their economies as a whole, specifically in Ghana.

The ECTs show the existence of a mechanism that adjusts the dis-equilibrium between economic performance and stock market development indicators. Although not all ECTs are significant, they have the right sign. This implies that the significant negative sign under a Growth-led stock market indeed supports the presence of cointegration between the variables, whilst causality is unidirectional (The lack of bi-directional causality for Ghana, in this study, agrees with the work of (Eslamloueyan and Sakhaei, 2011; Pradhan, 2009) that there is no bi-directional causality in countries that have small and less liquid stock market) running from real GDP to stock market development.

Given that the results of ARDL indicate the nonexistence of cointegration between stock market indicators and economic growth for Nigeria, the Vector Autoregressive model (VAR) (In all Akaike Information Criterion (AIC) and Schwartz Criterion (SC) were used for selecting the lag length (K) and they both agreed on the lag length of one) is, therefore, estimated in the first differences. The Wald test is calculated to test the joint significance of the lagged values of the variables for the short run. Table 4 (Given that the Nigerian stock market is relatively small and less liquid by world standards, there is no bi-directional causality between stock market development and economic growth for developing countries, including Nigeria (Apergis *et al.*, 2007; Shahbaz *et al.*, 2008)) shows the results obtained. In

Nigeria's case, the null hypothesis that even at a 10% significant level, stock market development indicators do not Granger cause real GDP in the short run cannot be rejected. Per the results obtained, under stock market dev-led growth, market capitalization and value traded ratio do not Granger cause economic growth in the short run. On the other hand, at a 10% significant level, the null hypothesis that economic growth does not Granger cause stock market development can be rejected for market capitalization alone. This implies that economic growth Granger causes the development of the stock market in the short run. This finding is in line with the results obtained by Enisan and Olufisayo (2009) that changes in the level of stock market development would be Granger caused by changes in economic performance for Nigeria. However, for the control variables (regulatory quality and trade openness), the results reveal that both Granger causes economic growth in the short run, suggesting that their changes are crucial for causing changes in the Nigerian economy.

In line with the findings, it is only suggestive that inadequacies in domestic resource mobilization coupled with the inefficient utilization of resources could account for the shallow evidence of Granger causality running from economic growth to stock market development. Specifically, the huge resource rents (oil revenue inclusive), which perhaps have some positive effects, have not been reflected in real economic performance. This gloomy development could well play a crucial role in affecting stock market activities. Overall, stock market development possibly has the potential of stimulating economic development, if there is improvement and consolidation on the current level of financial sector development through a comprehensive set of policy measures in both countries.

Conclusion

The paper examines the long-run and causal relationship between stock market development and economic growth in a comparative context of Ghana and Nigeria using the ARDL bound test approach and the Granger causality test through the VECM framework. Whilst there is evidence of unidirectional causality for the two countries, the study could only discover a long run cointegrating relationship among the series for Ghana.

Based on the VECM framework, the Granger causality test indicates that the direction of causality only runs from economic growth to stock market development (i.e., unidirectional) for Ghana. The lessons that could be inferred from these findings are; first, stock market development would be enhanced by policy measures adopted to further boost macroeconomic performance and promote private sector competitiveness. Second, there is a need to maintain an improved institutional framework and sustained drive towards enhancing

financial sector performance for attaining a competitive business environment, which could stimulate public investment decisions which in turn would induce economic growth.

In Nigeria's case, the results are somewhat analogous to the one obtained for Ghana but based on the Granger causality test within the VAR framework, the direction of causality also runs from economic growth to stock market development. However, the unidirectional causality is feeble given the empirical evidence. As a consequence, the findings demonstrate that a poor regulatory environment, decrepit macroeconomic management coupled with a high level of inefficiency across all sectors of the economy are strongly associated with these gloomy accounts. Hence, with the launching of the right mix of regulatory, legal, and fiscal remedial measures which could consolidate and improve on current economic performance and investment patterns in the economy to generate capacity for capital market activities through robust institutional and governance structure, Nigeria could thus foster her economic growth.

In all, the evidence from the study unveils the shallow and tiny (small) state of stock markets in the two countries coupled with the weak level of integration of West Africa's stock markets into their respective economies and the inability of the financial sector to complement other critical sectors of their economies. Thus, the study suggests that policymakers should launch reforms that entail the overhaul of the legal and regulatory framework as well as principles underlying effective supervision. Also, they should ensure the proper integration of their stock markets into their respective economies, whilst the integration of the two markets could well aid the development of stock markets in their countries. These would indeed enhance both private and public institutional investors' participation in capital market activities.

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Author's Contributions

Fisayo Fagbemi: Coordinated the data analysis, contributed to the writing of the manuscript, designed the research plan, and organized the study.

John Oluwasegun Ajibike: Reviewing of the literature.

Ethics

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