Stock Market Performance and Economic Growth Nexus: A Panacea or Pain to Ghana?

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Abstract: **This study examined whether stock market performance instigates growth, using yearly data from the World Development Indicators and the Ghana Stock Exchange for the period 1990 to 2018. The Johassen co-integration and vector error correction model framework were applied to determine the long-run and short-run dynamics. The Granger causality test was used to estimate the link between the stock market and economic growth. The findings showed a statistically significant and negative long-run relationship between the stock market and the economic growth nexus. The Granger causality test results showed that there was no causality between stock market performance and economic growth. Hence, the study concluded that stock market performance does not promote growth in Ghana. The research provides pragmatic guidance to policymakers to focus their efforts on the information flow of exchange activities to the public space and start a nationwide informative tour to explain the roles and gains of investing in the exchange. Policymakers should also ensure that the exchange efficiency rate is activated by listing more firms.**

Keywords: **stock market, economic growth, performance, exchange rate, causality test**

I. INTRODUCTION

Studies have clarified why some nations grow more rapidly than others and obtain resources distinctly (Feldmann, 2019; Lauka, 2018; Magnus, 2019; Carlos, 2012; Narcis Serra & Stiglitz, 2008). It is well documented that the growth rate invigorates a country's effectiveness, dynamism, and recognition in the international spectrum. The assertion of stock market relations to growth began with Bagehot (1873), followed by Schumpeter (1911), who asserted that finance was crucial to economic growth. As far as nations are concerned and seen as the epicenter of growth, at any stage of developmental processes, both the private sector and government require long-term capital for their desired growth. Baumol (1965) stated that there was an expectation that the stock market would act like an alliance to permit the use of investment for future projects. Bencivenga and Smith (1991) revealed that when uncertainties are reduced, larger liquidity may decrease the rate of savings, which would impact growth. Obstfield (1994) and Devereux and Smith (1994) established that the stock market would positively impact economic growth by diversifying the risk, which was confirmed by Felicia Olokoyo et al. (2020).

Studies such as Demirgüç-Kunt and Levine(1996) and Levine and Zervos(1996) have proven that there is continuance of a linkage for stock market growth affiliation. Rousseau and Wachtel(1998) hinted at the four main roles of stock market aid in identifying economic growth. First, they lamented on the fact that investors get to know about their investment in the public offer stage, which may increase activities in relation to entrepreneurial concepts. Second, all security markets facilitate inflows of capital and portfolio investments, which serve as a plus to developing economies. Third, they hold the idea that the stock market provides capital to finance stupendous projects. Finally, the stock market serves as the provision of information flow between the management and owners. Morck et al. (2000) mentioned that stock market development tends to harm economic growth by counteracting concerted takeovers. Mayer(1988) claimed that the stock market's colossal strength was frivolous to corporate finance. Singh (1997) argued that it was unlikely to attain long-run growth quickly in most emerging economies.

In the past, economists such as Romer(1986) and Lucas(1988) have considered technological progress, capital accumulation, and human capital as the major proponents of economic growth processes. However, recent progress in the development of growth theory has shown that there has been a total shift from the traditional concepts of growth theories. Schumpeter(1911) stated that innovation in technological concepts was a driving force for long-run dynamic growth. Indeed, it is a concrete testament that as economies grow, there should be a substantial supplement for the expansion of growth effects. As such, the stock market provides a podium for listed firms to raise funds that are long term and also provides an avenue for capitalists to invest in excess assets. Ofori-Abebrese et al.(2016) suggested that although the developmental state of the stock market is rapidly growing in Africa, the majority of these capital markets are immature.

Over the past decade, many confident emerging economies, such as Ghana, have experienced numerous changes in their economic structures that have affected their growth rate. Each year, people accredit and hope that the buoyant growth rate can boost the standard of living and the fiscal freedom of the populace. In anticipation, disposable income levels and compensation for the masses continue to be at their lowest points. Spence (2011) suggested that the world in which we live is braced up and fully equipped for generational convergence with regard to growth effects, until now, many nations are static and stable in the diverging phase.

There are limited studies with diverse opinions on stock market-growth relations in Ghana. For instance, Ofori-

Abebrese et al. (2016) and Adusei (2014) revealed that the stock market does not induce economic growth. However, both Osei (2005) and Dziwornu and Awunyor-Vitor (2013) failed to state the impact of the contributory link for the stock market-growth relationship; thus, they failed to attest to the assertion that the link between the two estimates was either positive or negative. Apio(2014) affirmed that the stock market instigates economic growth. However, this assertion on the subject matter in relation to the literature is cloudy and less clear in developing economies such as Ghana.

This study adds to the analysis of whether stock market performance promotes or stifles economic growth using Ghana as a reference point.

II. LITERATURE REVIEW

The literature has acknowledged contrasting and a number of appealing ideas as the best fit to add up to individual attestation of the stock market and economic growth nexus. Among them encompasses, but are not limited to, Atje and Jovanovic (1993), Greenwood and Smith (1995), Levine and Zervos (1998), Filer et al.(1999), Agarwal (2001), Mohtadi and Agarwal (2001), Biswal and Kamaiah (2000), Alamand Hasan (2003), Beck and Levine (2005), and Brasoveanuet al.(2008).

In light of this, Greewood &Jovanovic (1990.) stated that the stock market has instigated growth. Enisan and Olufisayo (2009) deal with the proclamation that the stock market will possibly induce growth. Van Nieuwerburgh et al. (2006) argued that the stock market triggers growth. Har et al. (2008) document that the stock market causes growth. Vazakidis and Adamopoulos (2009) mention that the stock market is relevant to growth. Nowbutsing and Odit (2009) established the concept of a stock market for economic growth. Nazir et al. (2010) found that the stock market would solitary affect growth completely when market capitalization increases. Erdem et al.(2010)acknowledged that the stock market-growth relationship is close. Paramati and Gupta (2011) proposed that stock markets influence growth.

Currently, various researchers have pursued the concept of broadening the confines of stock market-growth connections. Regmi (2012) examines the seminal interconnection of the stock market on growth using the Nepalese economy as a case study. The author concluded that there is an affirmative connotation for the stock market-growth nexus. Okodua and Ewetan (2013) found that the stock market casts doubt as a gauge for measuring the health of the economy. Ultimately, Adusei (2014) finds that there is no confirmation of stock market development on growth.

Wild and Lebdaoui (2014) ascertained that a long-run relationship exists for stock market-growth connections. Kinuthia and Etyang (2014) revealed that stock market liberalization obliquely sways economic growth via investment. Ofori-Abebrese et al. (2016) studied stock market growth ties and found no progression between the two guesstimates. Manu (2017) assessed the interrelationship of stock market growth connotation and revealed that in the short-run stock market has a constructive outcome on growth, but the opposite happens for long-run dynamics. All capital markets are important to the growth of any nation that provides policymakers with factors in their national characteristics for sustainable development and growth (Rhumohan, 2019).

III. THEORETICAL FRAMEWORK

This study adopted the Cobb-Douglas –type production function, as postulated by Solow (1965). The model specification approach was chosen because it can capture both the inputs and outputs in a specified period or across time. Intrinsically, it links real investment as a stand-in for gross fixed capital formation which gives vivid explanation of the growth effect pattern. The chosen model is in cooperation with economic growth theory, as it bridges the linkage between capital and output ratios. The specification of the Solow (1965) model of the Cobb-Douglass production framework is as follows:

$$\gamma_t = \kappa_t^{\alpha} (\mathrm{A}_t L_t)^{1-\alpha} \tag{1}$$

Where $\gamma_t =$ total output at time t

$\kappa_t =$ Capital stock at time t

L_t = labor at time t

A_t = Productivity of labor at time t

The above equation is called total factor productivity. The total factor productivity, as used by Hornstein and Krusell (Hornstein & Krusell, 1996) and Easterly and Levine (Easterly, W. and Levine, 2002) can further be deduced as:

$$\gamma = \kappa^{\alpha} (\mathrm{A}L)^{1-\alpha} \tag{2}$$

$$\gamma = \mathrm{A}^{1-\alpha} \kappa^{\alpha} L^{1-\alpha} \tag{3}$$

$$\gamma = \beta \kappa^{\alpha} L^{1-\alpha} \tag{4}$$

Where $\beta \equiv A^{1-\alpha}$

$$\beta = \frac{\gamma}{\kappa^{\alpha} L^{1-\alpha}} \tag{5}$$

$\beta =$ Represents the output for all the factors added together. Assuming overtime, if the total income γ increases because of the β, κ, L

$$LN\gamma_t = LN\beta_t + \alpha LN\kappa_t + (1-\alpha) LNL_t \tag{6}$$

$$\frac{\Upsilon}{\gamma} = \frac{\mathrm{B}}{\beta} + \alpha \frac{\mathrm{K}}{\kappa} + (1-\alpha)\frac{l}{L} \tag{7}$$

Where the derivatives are represented as Υ, B, K respectively.

From the foregoing, the specialized form of the equation is shown below:

$$\gamma_t = A_t \kappa_t L_t^{1-\alpha} \varepsilon^{\Phi_t} \quad (8)$$

IV. METHODOLOGY

The study used secondary data based on selected variables from 1990 to 2018. Some of the datasets were sourced from the Ghana Stock Exchange (GSE) market report (2018); thus, market capitalization (MKTCAP). For variables such as GDP growth (GDPg), capital flows (CF), inflation (INFL), real investment (RI), and savings (S) were sourced from the World Development Indicators database (2020). Authors employed STATA version 11.0 for the data analysis.

Table 1: Summary of variables used, conceptions, proxies, expected signs and source

Variables	Conception	Proxies	Expected Signs	Source
GDPg	GDP Growth	Economic Growth	Positive	WDI
MKTCAP	Market Cap.	Stock Market Performance	Positive	GSE Market Report
RI	Real Investment	Gross Fixed Capital Formation	Positive	WDI
S	Savings	Gross Savings	Positive	WDI
CF	Capital Flows	Foreign Direct Investment	Positive	WDI
INFL	Inflation	Inflation	Negative	WDI

V. ECONOMETRIC MODEL SPECIFICATION

From the definition of TFP, the empirical model used by Wang and Ajit (2013) is specified as follows:

$$A_t = f(MKTCAP, RI, S, CF, INFL) \quad (9)$$

Equation (9) can be written as:

$$A_t = MKTCAP^{\beta_1} + RI^{\beta_2} + S^{\beta_3} + CF^{\beta_4} + INFL^{\beta 5} \quad (10)$$

Substituting equation (10) into equation (4)

$$\gamma = \delta MKTCAP^{\beta_1} + RI^{\beta_2} + S^{\beta_3} + CF^{\beta_4} + INFL^{\beta_5} \quad (11)$$

The Long Run Dynamic Model

From equation (11), taking logarithms of the variables results in $LN\gamma = LN\delta + \beta_1 LNMKTCAP + \beta_2 LNRI + \beta_3 LNS + \beta_4 LNCF + \beta_5 LNINFL + \varepsilon LN\phi$

(12)

The long run is obtained by setting $LN\delta = \beta_o$ and; $LN\phi = 1$ hence, the long-run equation is $LN\gamma_t = \beta_0 + \beta_1 LNMKTCAP_t + \beta_2 LNRI_t + \beta_3 LNS_t + \beta_4 LNCF_t + \beta_5 LNINFL_t + \varepsilon_t$ as 13:

Differencing equation (13), the long run equation will be obtained as:

$$\Delta LN\gamma_t = \beta_0 + \beta_1 \Delta LNMKTCAP_t + \beta_2 \Delta LNRI_t + \beta_3 \Delta LNS_t + \beta_4 \Delta LNCF_t + \beta_5 \Delta LNINFL_t + \varepsilon_t$$

(14)

The Short Run Dynamic Model

The error correction model measures the speed of adjustment to which the long-run returns to the short run after a dispensation of disequilibrium.The error correction model is estimated as follows:

$$\Delta LNGDPg_t = \sum_{F=1}^{K} \psi_1 GDPg_{t-1} + \sum_{F=1}^{K} \psi_2 \Delta LNMKTCAP_{t-1} + \sum_{F=1}^{K} \psi_3 \Delta LNRI_{t-1} + \sum_{F=1}^{K} \psi_4 \Delta 1\, LNS_{t-1} + \sum_{F=1}^{K} \psi_5 \Delta LNINFL_{t-1} + \sigma ECM_{t-1} + \varepsilon_{t-1}$$

(15)

VI. RESULTS AND DISCUSSION

Unit Root Test

The stationarity test is a key feature of time-series analysis. The study utilized both the Augmented Dickey-Fuller (ADF) and Phillips Perron unit root tests to determine the stationarity and order of integration of variables. The results of both ADF and PP showed that at levels, the variables were non-stationary and could not be rejected. Therefore, the first difference of variables was taken, and as such, the null hypothesis of the stationarity test was rejected at the 5% significance level. In conclusion, all variables used in the analysis were integrated into the first order.

Table 2: Test Results of ADF and PP

Variable	ADF At Levels	PP At Levels	Lags	ADF First Difference	PP First Difference	Lags	Order of Integration I (1)
lnGDPg	-2.347 (0.157)	-2.156 (0.126)	3	-6.059 (0.000)**	-6.099 (0.000)**	0	1
lnMKTCAP	-1.991 (0.290)	-2.107 (0.241)	0	-4.356 (0.000)**	-4.365 (0.000)**	0	1
lnRI	-2.452 (0.127)	-2.524 (0.109)	0	-4.061 (0.001)	-3.983 (0.001)***	0	1
lnCF	-2.549 (0.104)	-2.562 (0.101)	0	-4.344 (0.000)**	-4.296 (0.000)**	0	1
lnS	-2.415 (0.1376)	-2.476 (0.121)	0	-5.841 (0.000)**	-5.888 (0.000)**	0	1
lnINFL	-3.111 (0.255)	-2.765 (0.276)	1	-2.584 (0.011)***	-2.683 (0.023)***	1	1

** shows the 1% significance level and *** indicate 5% significance level

Co-integration Test

The Johanssen co-integration test was performed to determine the long-run relationships among the variables used in the analysis. Table 3 shows both the trace statistics and the Max-Eigen of the Johanssen test. From Table 3, it can be concluded that there exists one co-integration equation for both the trace and max-eigen tests. There was a rejection of the null hypothesis of no co-integration because the values of both the trace and max-eigen statistics were greater than the critical value. Hence, a significant long-run relationship exists among the variables. Therefore, a vector error correction framework was used to describe both the long-run and short-run dynamics.

Table 3: Trace and Max Eigen Statistics

Rank	Trace Statistics	Critical Value	Max Eigen	Critical Value
0	131.189	94.15	57.628	39.37
1	73.560*	68.52	39.262*	33.46
2	34.298	47.21	12.901	27.07
3	21.397	29.68	9.445	20.97
4	11.952	15.41	7.832	14.07
5	4.119	3.79	4.119	3.76

* indicates rejection of the null hypothesis at the 5% significance level

Long Run Dynamics

Table 4: Results of Long Run Relationship

Variable	Coefficient	Standard Error	P-Value
lnMKTCAP	-0.481	0.065	0.000*
lnRI	2.361	0.263	0.000*
lnS	-0.686	0.111	0.000*
lnINFL	0.818	0.491	0.096**
lnCF	0.083	0.0863	0.333
C	-0.011		

* Significant at the 1% significance level, ** significant at the 5% significance level

The test results from the long-run dynamics showed that market capitalization has a negative but statistically significant coefficient in relation to economic growth. In fact, if all other factors are held constant, economic growth would decline by 0.481 percentage points when market capitalization rises by a percentage point. This indicates that stock market performance has a negative effect on economic growth in the long run. In addition, the other macroeconomic factor variables used in the analysis had distinct estimations. Real investment was wholly correlated to economic growth and statistically significant at the 1 percent significance level. This result agrees with theoretical predictions. All things being equal, if real investment increases by one percent, economic growth wouldincrease by 2.361 percent. Savings negatively affected economic growth in the long run. Hence, a percentage increase in savings would decrease economic growth by 0.686 percent, all else being unchanged. Conversely, inflation recorded a positive coefficient, but was marginally significant at the 10 percent significance level. This means that in the long run, when inflation rises by one percent, economic growth would increase by 0.818 percent, ceteris paribus. Both the savings and inflation results deviated from theoretical predictions and their expected signs. However, capital flows had a positive relationship with economic growth, but were insignificant.

Vector Error Correction Model

Table 5: Results of Short Run dynamics

Variable	Coefficient	Standard Error	P-Value
DlnMKTCAP	0.707	0.239	0.113
DlnRI	-0.096	0.878	0.273
DlnS	0.429	0.217	0.049**
DlnINFL	-0.714	0.222	0.001*
DlnCF	0.054	0.220	0.803
ECM	-0.614	0.148	0.000*

* indicate 1% significant level, ** represent 5% significant level.

Table 5 shows the analysis of the short-run connotations of the variables used for the assessment. The error correction term or ECM measures the speed of adjustment in the long-run equilibrium. The adjustment term (-0.614) was negative and statistically significant, which suggests that previous year errors or deviance from the long-run equilibrium were amended for within the contemporary year at a convergence speed of 61.4 percent. In addition, there was stability in the mechanism of the error term because the coefficient was less than 1 and would converge to equilibrium whenever there is a dispensation from the short run.

Further from Table 5, the results for the short-run dynamics differed from the long-run dynamics in relation to economic growth except capital flows, which maintained a positive coefficient but insignificant for both long-run and short-run estimations. Again, market capitalization is positively related to economic growth, but insignificant in the short run. Real investment recorded a negative coefficient in the long run, but was insignificant. Inflation in the short run was negatively associated with economic growth and statistically significant at the 1 percent significance level. All things being equal, 1percent increase in inflation would decrease economic growth by 0.714percent.This confirms the prediction in Table 1 of the study.However, savings positively affected economic growth in the short run and were significant at the 5 percent level of significance. Ceteris paribus, 1percentincrease in savings would increase economic growth by 0.429percentand this is in confirmation of expected signs in Table 1.

Granger Causality Test

The results in Table 6 showed that there was no causality between stock market performance and economic growth. The null hypothesis against the alternative hypothesis of causality could not be rejected; as such, the p-value was insignificant, even at the 1 percent significance level. This indicates that Ghana's stock exchange is not a paramount proponent of the country's economic growth, and vice versa. However, unidirectional causality exists between real investment and economic growth.

Table 6: Causality Test

Null Hypothesis	Chi2	P-Value
lnMKTCAP does not Granger cause lnGDPg	1.564	0.457
lnGDPg does not Granger cause lnMKTCAP	2.346	0.309
lnRI does not Granger cause lnGDPg	8.111	0.017
lnGDpg does not Granger cause lnRI	7.029	0.030
lnCF does not Granger cause lnGDPg	1.224	0.542
lnGDP does not Granger cause lnCF	0.515	0.773
lnS does not Granger cause lnGDPg	0.201	0.904
lnGDPg does not Granger cause lnS	0.757	0.685
lnINFL does not Granger cause lnGDPg	2.966	0.227
lnGDP does not Granger cause lnINFL	1.050	0.591

Diagnostics test

The diagnostic test performed on the regression analysis provides a representation of the validity of the model used for the estimation. The diagnostic test showed no problems associated with heteroskedasticity and autocorrelation. The test also showed that the data used for the analysis were normally distributed. Tables 7 and 8 depict the results of the autocorrelation, heteroscedasticity, and normality tests, respectively.

Table 7: Autocorrelation and Heteroskedasticity Test Results

Test Statistics	Chi2	P-Value	Conclusion
Breusch- Godfrey test for autocorrelation	0.256	0.611	No autocorrelation
Breusch-Pagan test for heteroskedasticity	0.02	0.891	Absence

Table 8: Normality Test

Variable	Pr (Skewness)	Pr (Kurtosis)	P-Value
lnGDPg	0.233	0.348	0.284
lnMKTCAP	0.123	0.420	0.190
lnRI	0.401	0.058	0.110
lnCF	0.047	0.638	0.116
lnS	0.033	0.834	0.199
lnINFL	0.246	0.146	0.152

VII. CONCLUSION

The study sheds more light on the stock market growth relation in Ghana, using annual data for the period 1990 to 2018 obtained from the GSE market report and the World Development Indicators website. The study used the Johansen co-integration test analysis as well as the vector error correction model to estimate long-and short-run associations. The study applied the Granger causality Wald test to analyze the causal association between stock market performance and economic growth. The co-integration results showed that a long-run relationship exists among the variables used for the estimation. There was no causal linkage between stock market performance and economic growth and, as such, the study concludes that stock market performance does not promote growth in Ghana. The results of the study are consistent with the findings of Ofori-Abebrese et al. (2016) and Adusei (2014), who found that the stock market does not promote economic growth in Ghana.

Hence, measures should be put in place to activate the efficiency level of the stock exchange and to increase the size of firms' participants, as the current listed firms are very limited; as its capitalization is infinitesimal compared to the nation's GDP. Further, information on exchange activities should be made available via news bulleting or social media for prospective investors to be conversant with the performance and activities of the exchange. This would also help investors participate in share trading other than other investment instruments, and this could increase the market capitalization rate when shares are purchased on the exchange.

The exchange should embark on a nationwide educational tour on the stock market to explain the procedures, functionalities, and benefits that one would gain when he or she invests in the exchange. Booklets or fliers of exchange activities should be made available to the public, especially academia and consulting agencies. This would help domestic investors understand the need to invest in the exchange and clarify the concept of investment to the populace.

VIII. LIMITATION TO THE STUDY

The study used data from 1990 to 2018 and wish to have added the last two lags, and further studies should look into the 2019/2020 figures because of the effects of the COVID-19 pandemic on economies.

COMPLIANCE WITH ETHICAL STANDARD

The authors have no conflict of interest as far as this study is concerned and the corresponding author affirms that on behalf of the authors.

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