



## ECONOMIC GROWTH AND STOCK MARKET DEVELOPMENTS: EVIDENCE IN AFRICA

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### Abstract

*This study examines the interaction between stock market developments and economic growth in a sample of 12 African countries using a panel VAR approach with data from 1979-2013. In order to establish the suitability of the data for the study, Cross-Sectional Dependence (CD) test, Unit root test, and Cointegration test were performed. We then estimated the model and from the residuals generated, the impulse response functions (irf) and the forecast error variance decompositions (fevd) were also estimated. As robustness check, we performed autocorrelation Lagrangian Multiplier test on the residuals generated from the panel VAR model estimation and found a significant correlation of all series within and across panels: a basis to conclude that the findings hold for all sampled countries studied, in line with the CD test results. The study found no evidence of contemporaneous relationship between stock market and economic growth in Africa. In the long run, the study found evidence of bidirectional relationship between economic growth and stock market developments, with economic growth having greater explanatory power (about 2.5%) on stock market developments than the former has on the latter. Finally, the study established a significant bidirectional relationship between inflation on one side and then economic growth and stock market developments on the other side. With these conclusions, we recommend that in order to stimulate economic growth and development, it is important African governments or the economic management teams of African countries are aware of this relationship (i.e economic growth-stock market nexus) for the purpose of forecasting and predicting in their economic planning.*

**Keywords: Stock market, Economic growth, Panel VAR, Impulse Response Functions (irf), Forecast Error Variance Decomposition (fevd).**

### Introduction

Financial markets play a significant role in promoting economic growth and development by facilitating the mobilization and efficient allocation of funds from borrowers (savers) to investors (lenders). One important financial market is the stock market which generally trades in stocks, bonds and other long term financial instruments. Stock market operations enable corporate bodies, businesses and other sectors of the economy to access long term capital thereby increasing the quantity and quality of investment, expand production and ultimately promote economic growth and development (Abu, 2009). Thus, stock market developments signal the level of economic activities in an economy and hence level of economic growth and development.

Recent literature suggests that the stock market has the tendency to affect the various sectors of an economy and therefore could be an alternative channel for the transmission mechanism of monetary policy actions (Ishioro, 2013, Challe & Giannitsarou, 2014; Chatziantonious, Duffy & Filis, 2013). Ishioro (2013) reports that as the size of the stock market increases, it would lead to higher investment opportunities for firms, making market capitalization an indispensable channel for economic growth. Empirically, monetary policy affects stock prices, which are linked to the real economy through their influence on consumption and investment spending; a view which is captured in both Modigliani's life

cycle and Tobin q's Models. These models respectively posit a direct relationship between the lifetime resources of consumers and stock prices, and between investment spending and stock prices (Miskin, 2001). Laopodis (2013) also discovered that, it is through financial markets that monetary policy affects the real economy. In a multi-country study of stock market response to monetary and fiscal policy shocks in Germany, UK and US, Chatziantonious et al. (2013) report that while innovations in monetary policy instruments greatly affect stock market performance; stock prices largely reflect economic developments. A shift in monetary policy indicates the direction of transfer of funds between money market and capital market (stock market) and thus determines stock market developments in an economy. An expansionary monetary regime would increase stock market activities, increase stock prices (high demand for stocks due to an increase in money supply) and consequently increase economic growth. A contractionary monetary regime would have a consequence of reducing economic activities. Therefore, the monetary environment could provide the trigger and as well serve as a conduit for the interplay between economic growth and stock market developments. What remains to be resolved is what magnitude of a change in economic growth is accounted for by a given magnitude of a change in stock market development? Is the interaction between the two magnitudes contemporaneous or there is the presence of lag effect? This study seeks to explore and find answers to the questions raised. The rest of the paper is organized as follows: review of literature, methodology, results and discussion and finally conclusions and recommendations.

### **Literature Review**

The purpose of establishing financial systems in any economy is to harmonize and enhance financial and economic activities thereby stimulating economic growth and development. This paper seeks to explore whether African financial markets particularly stock markets have made the desired impact of stimulating economic growth and vice versa.

There has been contrasting positions in literature as to whether financial systems play a significant role in economic growth. Some scholars argue that financial systems do not really matter in economic growth and development (Shin, 2012). Others even argue that stock market development may hinder economic growth by promoting counter-productive corporate takeovers (Owusu & Odhiambo, 2014). On the contrary, there is abundant literature to the effect that financial markets play a significant role in economic growth and development (Adu & Mensah, 2013; Chee-Keong and Chan, 2011 and Kargbo and Adamu, 2009). For instance, Adu and Mensah (2013) investigating the long-run growth effect of financial development in Ghana concluded that the growth effect of financial development is sensitive to the choice of proxy used. More importantly, they indicated that using either the private sector credit to GDP ratio or private sector credit as a ratio to total credit showed a positive and significant effect of financial development on growth. Similarly, Chee-Keong and Chan (2011) in a review of literature on the finance - economic growth relationship conclude that 'the development of theoretical models and use of regressions in the investigation of finance-economic growth relationship have shown reliably that there is a positive long-run relationship between financial development and economic growth'. Further, Abu (2009) empirically investigated the impact of stock market development on economic growth in Nigeria and found that the development of the Nigerian stock market increases its economic growth. These contrasting views open the way for an empirical examination of the interaction between stock market developments and economic growth. On the other hand, inflationary effect via monetary policy could play an intermediating role on the stock market-economic growth nexus. Empirics show that inflation is not only a monetary phenomenon and thus reflects what happens to the quantity of money per unit of output, but also influences the stock market and therefore plays an important role in the monetary policy-stock market nexus. Nelson (1976) found that inflation and stock prices are inversely related; a finding supported by Fama (1981) amongst others. However, this finding is contrary to a priori expectations by the Fisher hypothesis of a one-to-one increasing relationship between stock returns and inflation. These contrasting ideas led to the

emergence of several hypotheses, to explain the negative relationship between stock returns and inflation.

First: the tax-effect hypothesis of Feldstein and Horioka (1980) explains that inflation lowers stock market returns because the tax assessment of depreciation and inventory valuation are done in a non-neutral manner. This causes inflation to introduce corporate tax liability and reduce real after-tax earnings, thus reducing stock returns. Second: the proxy effect hypothesis of Fama (1981) posits a negative relationship between stock returns and inflation, since real activity correlates positively with stock returns, but negatively with inflation through the money demand effect. Fama's explanation for the inverse relationship between expected economic activity and current inflation follows two main assumptions: 1. that individuals are "rational" in the sense of making use of all available current information relevant to their monetary and financial decisions, and 2. that individuals' current demand for money is related to future real economic activity and current interest rates. Assuming that money supply, real economic activity, and interest rates are exogenous, the demand for money will become a means for the transmission of expected future inflation to current inflation. On reverse causality hypothesis; Geske & Roll (1983) argue that the reaction of stock markets to future economic activity is correlated with government revenue. In the event of a budget deficit and a decline of real activity, there is increased domestic borrowing or increased supply of money through the central bank to balance the budget. The increase in domestic borrowing or issuance of money has inflationary effects that dampen real activity. In the end, stock market returns also fall due to a fall in real activity and the inflationary effect; hence the negative relationship between stock market returns and inflation.

On the macroeconomic front; a review of salient literature reveals that shifts in macroeconomic variables affect stock market developments (see Barakat et al., 2015; Alam and Rashid, 2014; Pal and Mittal, 2011 and Tangjitprom, 2012). In the Middle East, Barakat et al. (2016) studied the long-run relationship between stock markets in Egypt and Tunisia and various economic variables. They found that the stock price index relates positively with exchange rate, Consumer Price Index (CPI) and money supply and negatively with interest rate.

Alam and Rashid (2014) studied the relationship between stock market returns and macroeconomic variables in Pakistan. Employing Johnson cointegration test, the authors found a long term relationship between stock market and macroeconomic variables. The CPI, money supply, exchange rates and interest rates were identified to be negatively associated with the stock returns whilst industrial production index were found to be positively associated with the stock returns. Earlier, Ibrahim, (2003) studied the long run relationship and dynamic interactions between Malaysian Stock Market, various economic variables, and major equity markets in US and Japan. He found that the Malaysian stock price index relates positively with money supply, consumer price index, and industrial production, and negatively with the movement of exchange rates. Mukherjee and Naka, (1995) studied the relationship between stock prices and macroeconomic variables in Tokyo, using exchange rate, money supply, industrial production index, inflation and interest rates, with data from 1971–1990 in a Vector Error Correction Model. They found a positive relationship for all other variables except for inflation and interest rates, which were observed to exhibit a mixed relationship. Further, Tsoukalas (2003) studied the relationship between stock prices and macroeconomic factors: exchange rate, industrial production, money supply and consumer price index in Cyprus using Vector Autoregressive model, and found a strong positive relationship between stock prices and all the macroeconomic factors. Zafar (2013) studied the impact of macroeconomic factors on stock market performance in Pakistan, and found among other things a negative relationship between real interest rate and stock market performance.

In Ghana, Coleman & Agyire-Tettey (2008) explored the impact of macroeconomic variables: inflation, exchange rate, lending rate, and Treasury bill rate on the performance of Ghana Stock Exchange with quarterly data from 1991:1- 2005:4 in an error correction model. They found that lending rates from bank deposits (moneys deposited in banks) have an adverse effect on stock market performance and serves as a major hindrance to business growth. The study again established that, inflation rate has a negative effect on stock market performance, but that there is the presence of lag effect; and that investor's benefit from exchange-rate

losses as a result of domestic currency depreciation. In Nigeria, Sunday (2013) studied the impact of monetary policy on Nigerian economic growth, using quarterly data from 1970:1–2010:4 in a vector error correction model. He found a long-run equilibrium relationship between monetary policy and economic growth and that interest rate and inflation rate were negatively correlated with gross domestic product (GDP). To the effect that Bagehot (1873), Chee-Keong and Chan (2011), Abu (2009) and Adu and Mensah (2013) all studied the financial markets and economic growth nexus focusing on single economies (England, Japan, Nigeria and Ghana) and neglected the influence of inflation and the monetary environment on the relationship of interest creates a research vacuum that a multi-economy approach to the subject could yield more robust results. Therefore, a multi-country approach of the link between stock market development and economic growth, while controlling for the effect of the monetary environment and inflation will be a novelty, and will add to existing literature on the subject matter for future research. This study further seeks to provide an interdependent empirical framework (i.e a robust empirical model on the relationship between the two variables) that possibly could capture the full dynamics of the relationship between economic growth and stock market developments.

### **Methodology of the Study**

To explore the relationship between economic growth and stock market developments, the study makes use of only secondary data. These data was sourced from the world development indicators-WB data site spanning from 1979-2013. In all twelve (12) countries were purposively selected because of the availability of data on those countries. These countries are Ghana, South Africa, Namibia, Nigeria, Morocco, Mauritius; Kenya, Egypt, Botswana, Ivory Coast, Zambia and Zimbabwe.

### ***Measurement of Variables Used***

Stock market developments is proxied by Standard and Poor (S&P) global equity index. S&P global equity index is an aggregate measure of the performance of stocks in a particular stock market relative to global stock market index. The New-Keynesian theory argues that asset prices are determined in a forward-looking manner, reflecting

the expected future discounted sum of returns on assets. Changes in asset prices can then be due to changes in the expected future dividends, the expected future interest rate or changes in the stock return premium. If monopolistic competition and mark-up pricing dominate the goods markets, profits will at least, in the short-run be affected by all factors that influence aggregate demand (Bjornland & Leitemo, 2009); hence the connection of asset pricing to the real economy.

Economic growth is proxied by GDP growth rate: GDP growth rate is the rate at which the overall level of economic activities in an economy changes with time. A high economic activity in a country results in higher incomes, which leads to higher investments and thus an increase in stock returns (Mishkin, 2001).

To control for the influence of the monetary environment on the relation of interest, two monetary policy stances: money supply and real interest rate are employed. Money supply is a measure of the amount of money in circulation and therefore determines the level of liquidity in the economy. Increased money supply due to lower interest rates attracts investors away from the stock market; making the stock market unattractive (Chatziantoniou et al., 2013), and this according to Coleman & Agyire-Tettey (2008) results in lower stock demands and consequently lower volumes and values of stocks traded.

Inflation can have a significant influence on the economic growth - stock market development nexus and thus is used as control variables in this study. Inflation is the rate at which the overall prices of goods and services change in an economy with time. According to Mishkin (2001), high rates of inflation increase the cost of living and shift resources from stock market instruments to consumables. This leads to a reduction in the demand for stock market instruments, with a corresponding reduction in trading volumes and value of traded stocks with no price increases. Market capitalization, which is the product of the share price and the total number of shares outstanding, may therefore fall as the demand for shares fall due to the substitution process.

**Estimation Procedure**

This study adapts a panel VAR framework in analyzing the relationship of interest, with the variables mentioned above.

The study focuses on 12 countries, therefore the model has both structural and panel VAR features with the structural representation of the model given as:

$$M_0 y_{it} = \sum_{j=1}^P M_j y_{i,t-j} + \mu_{it} \dots \dots \dots 1$$

$M_0 = 3 \times 5$  contemporaneous matrix of coefficients.

$y_{it} = 5 \times 1$  Vector of endogenous variables, i.e.  $y_{it} = [GDPG_{it}, IR_{it}, GMS_{it}, RIR_{it}, SMI_{it}]$ .

$M_j = 3 \times 5$  autoregressive coefficient matrices for the  $j^{th}$  lag,

$y_{i,t-j} = 5 \times 1$  Vector of the lags of the endogenous variables for each country  $i$ , and

$\mu_{it} = 3 \times 1$  vector of structural disturbances assumed to have zero covariance and generally correlated across each country,  $i$  (static interdependences).

The contemporaneous covariance matrix of the structural disturbances takes the following form:

$$E[\varepsilon_t \varepsilon_t'] = D \Sigma I \dots \dots \dots 1.1,$$

$I$  is a matrix of order  $3 \times 5$ , and  $\varepsilon_{it} = M_0^{-1} \times \mu_{it} \dots \dots \dots 1.2$

$M_0^{-1}$  is multiplied by both sides of equation 1 to get the reduced form of the model as;

$$y_{it} = \sum_{j=1}^P N_j y_{i,t-j} + \varepsilon_{it} \dots \dots \dots 2 \quad \text{Where:}$$

$$N_j = M_0^{-1} \times M_j \dots \dots \dots 2.1$$

and  $\varepsilon_{it} = M_0^{-1} \times \mu_{it} \dots \dots \dots 2.2$

The reduced form errors  $\varepsilon_{it}$ , are linear combinations of the panel errors  $\mu_{it}$ , with a covariance matrix of the form:

$$E[\varepsilon_{it} \varepsilon_{it}'] = M_0^{-1} D M_0^{-1} \dots \dots \dots 2.3$$

The reduced form of the model is subject to the following system of specific equations to be estimated:

$$GDPG_t = \sum_{j=1}^P a_{11j} GDPG_{t-j} + \sum_{j=1}^P a_{21j} IR_{t-j} + \sum_{j=1}^P a_{31j} MS_{t-j} + \sum_{j=1}^P a_{41j} RIR_{t-j} + \sum_{j=1}^P a_{51j} \Delta SMI_{t-j} + \mu_{1,t} \dots \dots \dots 2.4$$

$$IR_t = \sum_{j=1}^P a_{12j} GDPG_{t-j} + \sum_{j=1}^P a_{22j} IR_{i,t-j} + \sum_{j=1}^P a_{32j} MS_{t-j} + \sum_{j=1}^P a_{42j} RIR_{i,t-j} + \sum_{j=1}^P a_{52j} \Delta SMI_{t-j} + \mu_{2,t} \dots \dots \dots 2.5$$

$$\Delta SMI_t = \sum_{j=1}^P a_{15j} GDPG_{t-j} + \sum_{j=1}^P a_{25j} IR_{t-j} + \sum_{j=1}^P a_{35j} MS_{t-j} + \sum_{j=1}^P a_{45j} RIR_{t-j} + \sum_{j=1}^P a_{55j} \Delta SMI_{t-j} + \mu_{5,t} \dots \dots \dots 2.6$$

where  $\mu_{1,t}$ ,  $\mu_{2,t}$ , and  $\mu_{3,t}$ , are the respective shocks of the variables which are assumed to be serially uncorrelated and uncorrelated with each other.

Further;

*GDPG – Stands for GDP growth or growth of Gross Domestic Product*

*IR – Stands for Inflation Rate MS –*

*Stands for Money Saupply i. e Money and quasi in this study (monetary policy stance)*

*RIR – Stands for Real Interest Rate, i. e monetary policy stances*

*SMI – Stands for Stock Market Index*

### Shocks:

In line with Bjornland & Leitemo (2009) and Chatziantoniou et al. (2013), the study identifies the shocks of all the variables, from their respective equations. They include stock market shocks (sms), income shock (is), money supply shock (mss), interest rate shock (irs), and inflation shock (ps).

**Restrictions:** The panel disturbances in equation (1) can be estimated by imposing suitable restrictions on  $M_0$  as has been done in other related studies (see Chatziantoniou et al., 2013).

The short-run restrictions are:

- 1) GDP cannot be contemporaneously influenced by any other variable (Kim & Roubini 2000). On the contrary, it can contemporaneously influence all other variables (Chatziantoniou et al., 2013).
- 2) Inflation reacts contemporaneously only to an income shock and external shock, i.e. imported inflation (Kim & Roubini, 2000).
- 3) Both monetary and fiscal policy tools react contemporaneously to income and price shocks (Afonso & Sousa, 2011).
- 4) Interest rates are influenced contemporaneously by the external shock, the money supply shock (Elbourne, 2008) and the stock market shock (Bjornland & Leitemo, 2009).
- 5) Stock market returns are influenced contemporaneously by all variables (Bjornland, 2008). Thus from  $\varepsilon_t = M_0^{-1} \times \mu_t, \Rightarrow \mu_t = M_0 \times \varepsilon_t$ , deduced from equation (1), the restrictions show up in the system of matrix equations as:

$$\begin{pmatrix} \varepsilon_{1,it}^{is} \\ \varepsilon_{2,it}^{ps} \\ \dots \\ \varepsilon_{5,it}^{sms} \end{pmatrix} = \begin{pmatrix} a_{11} & 0 & 0 & 0 & 0 \\ a_{12} & a_{22} & 0 & 0 & 0 \\ \dots & \dots & \dots & \dots & \dots \\ a_{15} & a_{25} & a_{35} & a_{45} & a_{55} \end{pmatrix} \begin{pmatrix} \mu_{1,it}^{GDP} \\ \mu_{2,it}^{IR} \\ \dots \\ \mu_{5,it}^{SMI} \end{pmatrix} \dots (3)$$

### Preliminary Tests

We investigated the properties of the data employing Pesaran (2004) test for cross-sectional dependence, Hadri LM test for unit root and Westerlund (2007) test for cointegration. We then performed the Akaike Information Criterion (AIC) test and serial autocorrelation LM test to determine the appropriate lag length for the model, and to check serial correlation of the variables in the model.

### Econometric Tools for Data Analysis

The research data was analyzed using statistical and econometric software ‘STATA’. Because of the complicated dynamics in the panel VAR, the study employed impulse response functions (irf) and forecast error variance decomposition (fevd) in making the analysis. According to Stock & Watson (2001) these statistics are more informative than the estimated panel VAR regression coefficients or the  $R^2$ s and even the adjusted  $R^2$ s.

### Analysis and Discussion of Results

This section presents the analysis and discussion of the results of the study, beginning with the preliminary results followed by the main results.

### Preliminary Results

To test the suitability of the data, the study performed a number of preliminary tests. First, we performed cross-sectional dependence test of Pesaran (2004), and found that all the series are cross-sectional dependent (i.e CD test statistic = 17.650 and Pr = 0.0000). These may imply the existence of similar regulations in

various fields such as macroeconomic policies and stock market operations (Boubtane, Coulibaly, & Rault, 2012), which implies that the results of the study will hold for all the countries in the sample studied. Secondly, we performed the Hadri LM panel unit root test and established that at least one of the series contains a unit root, for all the variables. This means that some of the series are non-stationary, implying there could be a possible long-run relationship in some of the series.

**Table 1.0 - Hadri LM panel unit root tests-Results**

<i>Variable</i>	<i>LM-test</i>	<i>P-values</i>
GDPG	2.5076	0.0061
IR	3.1286	0.0009
MSGR	1.1450	0.1261
RIR	3.6505	0.0001
ΔSMI	-0.0246	0.5098

Source: Stata Output on dataset from WDI, 2014

Third, having established that some of the panel series are non-stationary, we proceeded to perform cointegration test on the panel series to ascertain a possible long-run relationship. We employed Westerlund, (2007) panel cointegration and found no evidence to reject the null hypothesis of no cointegration, dismissing the existence of the long-run relationship anticipated in some of the panels in the stationarity test.

Fourth, to determine the optimum lag length for the model the study performed an AIC test and the result is as shown in table 1.1.

**Figure 1.1 - Table 1.1 Lag-length selection results (Pre and post estimations)**

<i>Lag</i>	<i>AIC Value</i>	
	<i>Pre estimation</i>	<i>Post estimation</i>
1	27.7544	41.7597
2	27.3158	41.3605
3	26.1865*	40.2414*
4	26.7242	

Source: Stata output on dataset from WDI, 2014

**\*means optimum lag length**

The results indicate that the optimum lag length for the estimation of the panel VAR is three (3).

Lastly, as robustness check, we performed autocorrelation Lagrangian Multiplier (LM) test on the residuals generated from the panel VAR model estimation and found strong basis to conclude that there is significant correlation of all series within and across panels. Therefore, the findings of this study hold for all sampled countries studied as established earlier by the CD test results.

**Main Results**

The main result of the study is presented in two stages; the accumulated impulse responses from the impulse response functions (irf) and the forecast error variance decomposition (fevd).

*Accumulated Impulse Responses*

Using the AIC test results, the panel VAR model is estimated at lag 3 and then from the residuals generated the impulse responses are computed. Graphs of impulse response functions give information about the effects of changes in one variable on another.

Figure 1 shows that GDP growth is not significantly responding to the stock market shock contrasting the results of Alam and Rashid (2014) who found a positive relationship between industrial production and stock market. However, a negative stock market shock causes a positive inflation response. This result is consistent with that of Alam and Rashid (2014). The results further observed that, a negative stock market shock causes a negative interest rate response; a result that is consistent with that of Coleman & Agyire-Tettey (2008). Finally, a positive shock of the market leads to negative response of money supply.

Inflation and stock market index were also found to significantly respond negatively to GDP shock (see Figure 2). Similar results were reported in Germany, UK and US by Chatziantoniou et al. (2013) though the reaction of the UK stock market to GDP was insignificant. This negative response of stock market index to GDP shock is consistent with Geske & Roll (1983) reverse causality hypothesis which postulates that increased domestic borrowing or increased money supply in an attempt to balance budget deficit, comes with an inflationary effect that dampens real activity and eventually economic growth, subsequently stock prices fall.

Figure 3 shows a dormant GDP growth against inflation shock; a result which is at variance with Fama (1981)'s explanation of the inverse relationship between current inflation and expected economic activity. The result is consistent with a priori expectations as high inflation reduces consumption rendering GDP dormant or at worst decreases economic activity. Stock market index respond positively to inflation shock. This contradicts the

findings of Mukherjee & Naka (1995) that Tokyo stock price index has a mixed relationship with inflation but supports the Tsoukalas (2003) finding of a strong relationship between stock prices, and inflation consumer price index in Cyprus.

The graphs for the impulse response functions (irf) are presented below:

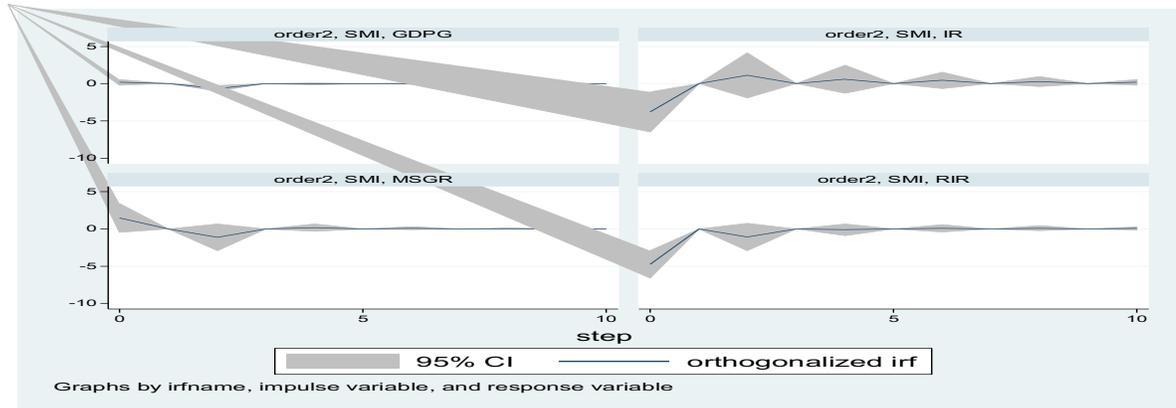


Figure 1 - Accumulated Impulse Responses to Stock Market Shocks

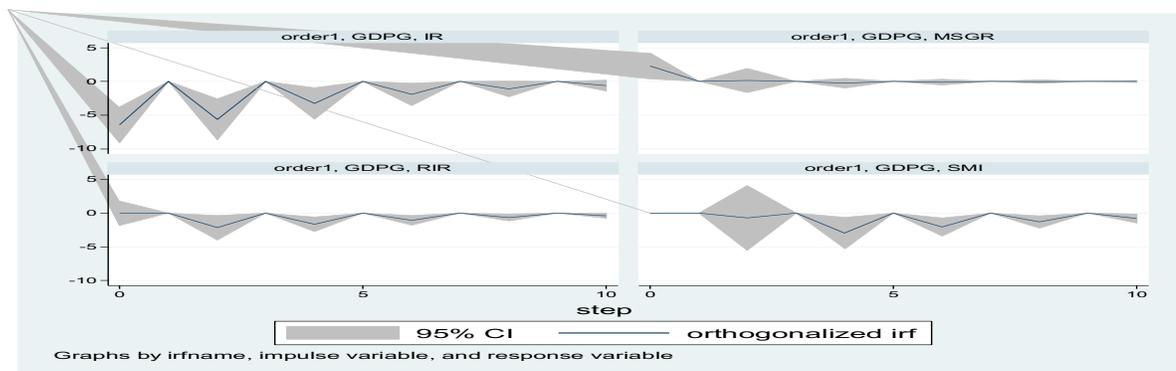


Figure 2 - Accumulated Impulse Responses to GDP shocks

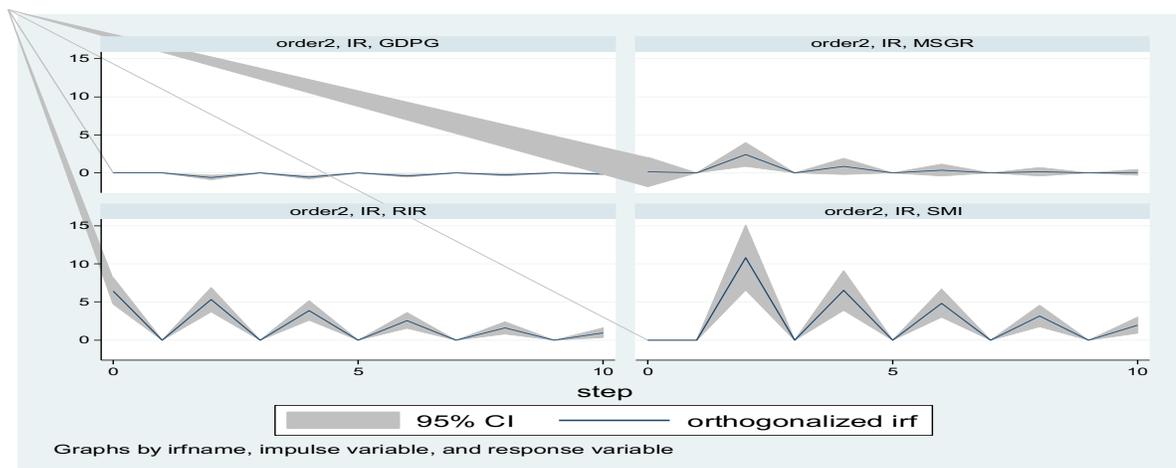


Figure 3 - Accumulated Impulse Responses Inflation Shock

### Forecast Error Variance Decomposition (fevd) Analysis

Here, we performed forecast error variance decomposition analysis to show how important shocks in one variable are in explaining fluctuations in other variables.

From table 2, the results indicate that generally the explanatory power of changes in one variable over changes on another variable improves as the forecast horizon widens (i.e from 1-10 forecast periods ahead). Specifically, at a conventional forecast horizon of 10 periods ahead; GDP growth accounts for about 2.5% of fluctuations in stock markets index, while stock market index accounts for about 0.5% of fluctuations in GDP growth. Inflation explains about 7% and 1.3% of the fluctuations in GDP growth and stock market developments respectively. While GDP growth and Stock market developments explain about 5.4% and 7% of inflation rate shocks.

### Panel Vector Autoregression System

The table below presents a summary of the forecast error variance decomposition of the panel vector autoregressive system to ease the analysis of the study.

**TABLE 2: Variation in the Row Variable explained by Column Variable (in %, 10 Periods Ahead)**

<i>VARIABLE</i>	<i>GDPG</i>	<i>IR</i>	<i>MS</i>	<i>RIR</i>	<i>SMI</i>
GDPG	91.24%	5.4%	0.4%	0.3%	2.5%
IR	7%	75.53%	14%	2.3%	1.3%
SMI	0.5%	7%	5%	11%	70.8%

Summary of the Forecast Error Variance Decompositions Estimated at 95% C.

### Conclusions and Recommendations

We examined the interaction between stock market developments and economic growth in a sample of 12 African countries using a panel VAR approach with data from 1979-2013 and found no contemporaneous relationship between stock market and economic growth.

In the long term, the study finds evidence of bidirectional relationship between economic growth and stock market developments in Africa with economic growth having greater explanatory power (about 2.5%) on stock market developments than the former has on the latter. That is to say a 1% increase in economic growth results in 2.5% decline in stock market performance. However, a priori expectation is an increase in economic growth leads to increase stock market developments as excess income due to increased economic growth can be invested in the stock market.

The study also established a significant bidirectional relationship between inflation on one side and then

economic growth and stock market developments on the other side. While inflation accounts more (about 7%) for changes in economic growth than it does (about 1.3%) for changes in stock market developments, stock market developments explain changes in inflation better (about 7%) than economic growth does (about 5.4%). That is a 1% decrease in economic growth results in 5.4% increase in inflation, and a 1% decrease in inflation leads to 1.3% increase in stock market development (the reverse trend is true). All the resultant effects (projections) will take place within a space of 3 years. Thus, an increase or decrease in inflation is not necessarily bad or good as such changes could be induced or managed to stimulate economic activities, enhance stock market developments and to stimulate economic growth.

Based on the above conclusions, we recommend that in order to stimulate economic growth and development, it is important African governments or the economic management teams of African countries are aware of this relationship (i.e.

economic growth-stock market nexus) for the purpose of forecasting and predicting in their economic planning.

Finally, it is essential that future studies on this topic consider countries with significantly different monetary policy regimes, since our cross-sectional dependence test results indicate significant correlation across panels, implying among other things similar monetary policy regimes across the sampled countries. Future researchers should consider data with high degree frequency such as monthly or quarterly data so as to generate more accurate results.

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