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# The Dynamics of the Relationship between Stock Market Development and Economic Growth in Zambia

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**Abstract**

Stock market activities assume a crucial role in determining the level of economic activities in both developing and developed economies, by effectively facilitating capital for investment, providing a proper stage to incite best corporate practices that will bring about growing investment and hence leading to a rise in the growth rate of the economy. In this regard, this study sought to empirically examine the dynamic relationship between stock market development and economic growth in Zambia. Using vector autoregressive (VAR) model and Granger causality test on quarterly time series data spanning 1996Q1-2015Q4, the study discovered that there existed a unidirectional causality running from market capitalisation to economic growth. By including certain macroeconomic variables as control variables, it was rather found that fluctuations in economic growth have significant predictive impacts on the current market capitalisation. The study further found that with the exception of inflation, changes in the level of money supply and foreign direct investment have no impacts on economic growth in Zambia.

**Keywords:** Stock market development, economic growth, money supply, foreign direct investment, inflation

## Introduction

Every economy strives to attain increasing growth rates so as to lessen poverty, better the living standards of its citizenry, create more revenues to the government, depict political position and strength among other benefits accruing to a country as its economy grows. For this reason, countries attempt to take advantage of the various sources of economic growth. Several studies such as Levine and Zervos (1998), Beck and Levine (2004), Odhiambo (2005), N'zue (2006), Naceur and Ghazouani (2007), Majid (2007), Argrawalla and Tuteja (2007), Dawson (2008), Yartey (2008), Deb and Mukherjee (2008), Nowbutsing and Odit (2009), Enisan and Olufisayo (2009), and Fink *et al. (*2009) have all evinced that stock market development is essential in fostering economic growth in a country. According to Demirgüç-Kunt and Levine (1996), an upsurge in world stock markets over the past decades, together with emerging markets have predominantly accounted for a greater amount of world economic growth.

Stock market plays a pivotal role in allocating funds to both corporate and government sectors which ultimately affects the economy of a country to a large extent. Stock markets enable both corporations and governments to raise long-term capital enabling them to finance new projects as well as expanding other operations (Olweny and Kimani, 2011). As economies develop, additional funds become necessary in meeting the rapid expansion process; and so stock markets serve as appropriate means in mobilising and allocating seemingly surplus funds among competing uses; which are critical to the growth and efficiency of an economy. A well-developed stock market encourages

savings by increasing the investment options offered to investors to branch out their portfolios. Thus, it provides investors with important sources of capital for productive investments at relatively low cost (Aktin and Dailami, 1990; Majid, 2007). According to Adjasi and Biekpe (2006), a more developed capital market provides liquidity that lessens the cost of foreign capital required for development. A well-functioning and liquid stock market assists investors to circumvent risk when capitalizing in encouraging projects (Caporale *et al.,* 2004), and developed financial markets are reckoned to be significant elements of long-run economic growth (Levine *et al.,* 2000; Ozturk, 2008; Yartey, 2008; Acaravci *et al.,* 2009; Cooray, 2010; Barna and Mura, 2010; Shin, 2013). In this sense, it is expected of well-organized and functioning stock markets to expedite the convenience of long-term capital for cost-effective activities of production in an attempt to advance the process of economic growth and development (Azam *et al.,* 2016).

Theory suggests that stock market development can foster long-term economic growth through facilitating resources allocation in an uncertain environment (Merton and Bodie, 1995). Stock market development performs a significant role in predicting the growth rate of an economy in the near future (Demirgüç-Kunt and Levine, 1996; Singh, 1997; Levine and Zervos, 1998). This has incited most developing economies to establish stock exchanges in anticipation of realizing the benefits of financial sector development as much as the developed economies (Minier, 2009).

The issue of whether the new stock exchanges may also have a significant and positive association with economic growth still remains a puzzle in developing countries. Empirical studies by Odhiambo (2005), Majid (2007), Tang *et al.* (2007), Dawson (2008), and Enisan and Olufisayo (2009) found a bi-directional causality between stock market development and economic growth. However, Osei (2005), N'zue (2006), Argrawalla and Tuteja (2007), Deb and Mukherjee (2008), Nowbutsing and Odit (2009), Zivengwa *et al.* (2011), and Bist (2017) indicated that there exists a unidirectional causality running from stock market development to economic growth. Also, Mazur and Alexander (2001), Azarmi *et al.* (2005), Sarkar (2007), Osuala *et al.* (2013), and Ofori-Abebrese *et al.* (2016) supported the independent theory which contends that stock market development and economic growth are not correlated. Though there are uncertain findings on finance-growth nexus, almost all of the recent scholars have demonstrated the significance of the stock market development for the growth of an economy (Beck and Levine, 2004; Odhiambo, 2005; Osei, 2005; N'zue, 2006; Argrawalla and Tuteja, 2007; Deb and Mukherjee, 2008; Majid, 2007; Tang *et al.*, 2007; Dawson, 2008; Nowbutsing and Odit, 2009; Enisan and Olufisayo, 2009; Zivengwa *et al.*, 2011; Bist, 2017).

Unfortunately, the establishment and development of capital markets in developing economies have been found to contribute more deleteriously to economic growth, since that these economies have a tendency to possess high rates of volatility in the prices of securities, market illiquidity, less regulated and organized markets, and unstable macroeconomic environments in relation to capital markets in most developed economies (Osinubi, 2001; Nuhiu and Hoti, 2011).

By the end of the 1980s, many low-income countries grappled with an unbearable amount of both local and foreign debts causing investment to vanish, obstructing economic growth, decreasing social spending and aggravating the suffering of the citizenry (World Bank, 2013). With regards to these problems, most Sub-Saharan African countries liberalized their financial sectors in the early 1990s to incorporate the inception of capital markets to solicit long-term capital to fund both governments and corporates' activities to enhance pro-poor economic growth (Acquah-Sam and Salami, 2014).

The establishment of Lusaka Stock Exchange (LuSE) with preliminary technical support from the International Finance Corporation (IFC) and the World Bank in 1993 (and commenced operations on February 21, 1994) was part of a broader economic reform which sought to lessen gov-

ernment regulations and restrictions in the Zambian economy in exchange for greater participation by private entities. The inception of LuSE was, therefore, considered as essential to the realization of the privatization programme in the country (Government of Zambia, 2001). However, the development of the LuSE was not led by the growth of the industry or by an upsurge in the issue of the stocks of a long-run (or permanent nature), as it was the experience of London Stock Exchange (Mwenda, 2001). In the study on small African stock markets, Marone (2003) indicated that the contribution of LuSE to the larger Zambian economy has been inconsequential. The failure of the LuSE to promote Zambia's economic growth is generally a function of the entire weak economic environment and less a result of technical and legal constraints on the stock exchange, as argued by Mwenda (2000). The thrust for this present study has to do with the numerous debates rising on the linkage between stock market development and economic growth in the context of developing economies with a particular focus on the Lusaka Stock Exchange in Zambia. Although several studies have been conducted on the finance-growth relationship in other economies, limited empirical evidence exists in the case of Zambia. This study, therefore, seeks to examine the dynamic relationship between stock market development and the growth rate of the Zambian economy.

The rest of the study is structured as follows: section 2 describes the data and econometric methodology, while section 3 presents the empirical results. Finally, section 4 deals with the conclusion of the study.

## Methodology

### *Model Specification*

Following Zivengwa *et al.* (2011), this study made use of a vector autoregressive (VAR) framework to ascertain the dynamic relationship between stock market capitalisation and economic growth. The VAR approach can be used to determine interdependence relationships among variables, even though it has no sound theoretical framework. In a VAR framework, all variables are considered as endogenous and this makes it an alternative methodology to simultaneous equation models. The VAR model used in this study was specified as;

$$Z_t = \sum_{i=1}^{N} \Omega_i Z_{t-i} + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

$where\ Z_t = \begin{bmatrix} RGDP_{t-i} \\ SMC_{t-i} \\ MS_{t-i} \\ FDI_{t-i} \\ INFL_{t-i} \end{bmatrix}$ which is a 5x1 vector of variables and $\Omega_1 \ldots \Omega_N$ represent a 1x5 vector of coefficients, whereas $\mu_t$ is a vector of error terms. RGDP is the real gross domestic product as proxied for economic growth, SMC represents the stock market capitalisation which is the proxy for stock market development, MS denotes the level of money, INFL connotes the rate of inflation, and FDI is the foreign direct investment. In order to rule out the difference in the units of the variables captured in equation (1), the study applied natural logarithm. Transforming the data into natural log abets to compute the variables in the same form and make the interpretation of the empirical results better and easy as well as reduce heteroscedasticity (Adukonu and Ofori-Abebrese, 2016).

### *Data Source*

The study used quarterly time series data covering the period 1996Q1 to 2015Q4 obtained from published sources. Data on real GDP, money supply, inflation, and foreign direct investment

were retrieved from the World Bank's World Development Indicators (2016). Data on the stock market capitalisation were obtained from the Lusaka Stock Exchange (LuSE).

***Test for Granger Causality***

The Granger causality test reflects the notion of causality developed by Granger (1969) and advanced by Engle and Granger (1987). It is an econometric tool that looks at identifying causality between a set of variables. This study sought to examine the causal relationship between the market capitalisation and economic growth of Zambia by first determining the direction of causality between them. A post VAR causality between the variables is expressed by the following equations;

$$Y_t = \Omega_{10} + \sum_{i=1}^{M} \Omega_{11} Y_{t-i} + \sum_{j=1}^{M} \Omega_{12} X_{t-j} + \mu_{1t} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

$$X_t = \Omega_{20} + \sum_{i=1}^{M} \Omega_{21} Y_{t-i} + \sum_{j=1}^{M} \Omega_{22} X_{t-j} + \mu_{2t} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3)$$

In the equations (2) and (3) above, $\Omega_{10}$ and $\Omega_{20}$ are the constant parameters. The error terms $\mu_{1t}$ *and* $\mu_{2t}$ are the serially uncorrelated white noise error term with a zero mean and a constant variance. $Y_t$ *and* $X_t$ are the two variables to be measured; thus the market capitalisation and the economic growth. M represents the optimal lag length for the variables. The hypothesis for testing equation (2) is;

$H_0: \Omega_{12j} = 0$

$H_1: \Omega_{12j} \neq 0$

Where *j* = 1……..M. From the hypothesis above, if $H_0$ hypothesis is rejected for at least a single j, then variable X Granger causes Y. On the other hand, the following hypothesis is set for equation (3);

$H_0: \Omega_{21i} = 0$

$H_1: \Omega_{21i} \neq 0$

Where *i*=1……M. The hypothesis above states that if $H_0$ is rejected for at least a single *i*, then the variable Y is said to be the Granger cause of variable X. If the basic hypothesis for $H_0: \Omega_{12j} = 0$ and $H_0: \Omega_{21i} = 0$ are all rejected for the two equations above, a bi-directional causality exists between them. However, if $H_0: \Omega_{12j} = 0$ and $H_0: \Omega_{21i} = 0$ are all accepted for the two equations above, then the study concludes that there exists no causal relationship between market capitalisation and the economic growth.

Sims (1980) introduced the VAR model as a measure that characterises the joint dynamic behaviour of a set of variables. By including additional variables to examine the dynamic linkage, the VAR as specified below is most appropriate.

$$y_t = A_0 + A_1 X_{t-1} \dots\dots\dots\dots A_p X_{t-p} + \mu_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (4)$$

Where $y_t$ represents a vector of endogenous variables; stock market capitalisation, economic growth, level of money supply, inflation, and foreign direct investment. $A_0$ is a vector of intercepts, $X_{t-i}$ represents a vector of the lagged values of the variables stated above and $\mu_t$ represents a vector of serially uncorrelated error terms. The equations represent a post VAR Granger causality test which is extended to include additional variables as shown below;

$$Y_t = \Omega_{10} + \sum_{i=1}^{M} \Omega_{11} Y_{t-i} + \sum_{j=1}^{M} \Omega_{12} X_{t-j} + \sum_{k=1}^{M} \Omega_{13} W_{t-k} + \sum_{l=1}^{M} \Omega_{14} U_{t-l} + \mu_{1t} \dots\dots\dots\dots\dots (5)$$

$$X_t = \Omega_{20} + \sum_{i=1}^{M} \Omega_{21} Y_{t-i} + \sum_{j=1}^{M} \Omega_{22} X_{t-j} + \sum_{k=1}^{M} \Omega_{23} W_{t-k} + \sum_{l=1}^{M} \Omega_{24} U_{t-l} + \mu_{2t} \dots\dots\dots\dots\dots\dots (6)$$

The above equations represent a post Vector Autoregressive (VAR) Granger causality test of the dynamic linkages between the market capitalisation and economic growth when certain variables of interest are included. In the equations above, $\Omega_{10}$ *and* $\Omega_{20}$ represent the constant parameters. Again, $\mu_{1t}$ *and* $\mu_{2t}$ are the serially uncorrelated white noise error term with a zero mean and a constant variance. The variables $Y_t$ *and* $X_t$ are the endogenised variables in the VAR model since all variables are treated on the same footing with no a priori information about which should be treated exogenously. M represents the optimal lag length for the variables.

The null hypothesis for equation (5) is;

$H_0: \Omega_{12} = \Omega_{13} = \Omega_{14} = \Omega_{15} = 0$

$H_1: \Omega_{12} \neq \Omega_{13} \neq \Omega_{14} \neq \Omega_{15} \neq 0$

The null hypothesis implies none of the lagged values of the variables have a causal relationship with the endogenous variable Y. A rejection of $H_0$ shows there is a causal relationship between at least a variable and the endogenous variable Y.

The null hypothesis for equation (6) is;

$H_0: \Omega_{21} = \Omega_{23} = \Omega_{24} = \Omega_{25} = 0$

$H_1: \Omega_{21} \neq \Omega_{23} \neq \Omega_{24} \neq \Omega_{25} \neq 0$

*where* $H_0$ represents no causal relationship between any variable and variable X. A rejection of $H_0$ implies that at least a variable Granger causes variable X.

## Results

### *Stationarity Test Results*

The test for stationarity of the variables used in this study was conducted within the framework of the Phillips-Perron test (Phillips and Perron, 1988). The results of the stationarity test are presented in Table 1.

**Table 1: Unit Root Test Results**

| Variables | Phillips-Perron Level | | Order of Integration |
|---|---|---|---|
| | No Trend | Trend | |
| LNRGDP | -1.0374 | -1.2121 | ? |
| LNSMC | -2.2433 | 1.2604 | ? |
| LNMS | -2.3793 | -2.3967 | ? |
| LNFDI | -2.9372** | -3.3742* | I(0) |
| LNINFL | -1.6568 | -2.5924 | ? |
| **Variables** | **Phillips-Perron First Difference** | | **Order of Integration** |
| | **No Trend** | **No Trend** | |
| LNRGDP | -3.2104*** | -3.2612* | I(1) |
| LNSMC | -3.8271*** | -3.8762** | I(1) |
| LNMS | -3.5588*** | -3.5532** | I(1) |
| LNINFL | -3.8337*** | -3.8450** | I(1) |

Note: [***] (**) {*} denotes the rejection of the null hypothesis of the unit root at [1%] (5%) {10%} significance level respectively.

From Table 1, the results indicated that only foreign direct investment was found to be stationary at its level, whereas real growth of the gross domestic product, stock market capitalization, inflation, and money supply all became stationary at their first difference. Given that the variables were integrated of order zero and one $[i.e., I(0)\ and\ I(1)]$, the study would not yield spurious regression results.

***The VAR Presentation for Economic Growth and Market Capitalisation***

Table 2 shows the VAR model for the two main variables of interest; the first difference of economic growth (which is proxied by real GDP) and the first difference of the market capitalisation. The results showed statistical significance of the coefficients of the exogenous variables in LNRGDP equation. With the coefficients of 0.5273 and 0.7079, a 1% increase in market capitalisation and economic growth in the previous year will cause the current rate of economic growth to rise by 0.53% and 0.71% respectively. Thus, an increase in the market capitalisation has a significant impact on economic growth and therefore it is relevant to policy decisions on sustaining the economic growth. The results differed when market capitalisation was endogenised.

**Table 2: The VAR presentation for Market Capitalisation and Economic Growth**

| Regressors | LNRGDP Equation | LNSMC Equation |
|---|---|---|
| $LNRGDP_{t-1}$ | 0.7079*** | 0.0794 |
| $LNSMC_{t-1}$ | 0.5273*** | 0.6273*** |
| *Constant* | 4.3821*** | -0.4123 |
| $R^2$ | 0.9386 | 0.5773 |
| *RMSE* | 0.3314 | 0.4733 |
| *P>chi2* | 0.0000 | 0.0000 |

***Note:*** **** represents 1% level of significance*

***Granger Causality Test Results***

Table 3 presents the post VAR estimation results for examining the Granger causality test for the two main variables; market capitalisation and economic growth at their first difference.

**Table 3: Granger Causality Test Results**

| Null Hypothesis | Chi-squared | P-value | Direction of Causality |
|---|---|---|---|
| (LNSMC) does not Granger cause (LNRGDP) | 13.042 | 0.000 | Causality |
| (LNRGDP) does not Granger cause (LNSMC) | 0.500 | 0.476 | No causality |

From the results, it was realised that the null hypothesis that the first lag of market capitalisation does not Granger cause a change in economic growth was rejected; given its *p-value* of 0.000. Thus, the lag of market capitalisation Granger causes a change in economic growth. However, the post VAR Granger causality test for the market capitalisation equation exhibited different outcomes. It was found that the null hypothesis that the first lag of economic growth does not Granger cause a change in market capitalisation was accepted and this was evidenced by the probability value of 0.476. The implication is that there exists no causality running from economic growth to market capitalisation. Thus, past variations in the country's economic growth do not Granger cause fluctuations in the current stock market capitalisation. This result confirms the findings of Huang *et*

*al.* (2000) in the case of United States, Japan, and China respectively, as well as Shahbaz *et al.* (2008) as a case for Pakistan. Also, a similar result was obtained by Osei (2005), N'zue (2006), Argrawalla and Tuteja (2007), Deb and Mukherjee (2008), Nowbutsing and Odit (2009), Zivengwa *et al.* (2011), and Bist (2017).

***VAR for Market Capitalisation and Economic Growth with Other Macroeconomic Variables***

The study included other macroeconomic variables (foreign direct investment, inflation, and the level of money supply) to assess the dynamic linkages that exist between the market capitalisation and economic growth, and the VAR results are presented in Table 4.

**Table 4: Results of VAR**

| **Regressors** | **LNRGDP Equation** | **LNSMC Equation** |
|---|---|---|
| Constant | -2.8584*** | 0.9782 |
| $(LNSMC)_{t-1}$ | -0.0138 | 1.5950*** |
| $(LNSMC)_{t-2}$ | 0.0467 | -0.6695*** |
| $(LNRGDP)_{t-1}$ | 1.4590*** | 0.8656*** |
| $(LNRGDP)_{t-2}$ | -0.3664* | -0.8864*** |
| $LNMS_{t-1}$ | -0.0221 | -0.0149 |
| $LNMS_{t-2}$ | 0.0247 | 0.0138 |
| $LNFDI_{t-1}$ | 0.0020 | 0.0565 |
| $LNFDI_{t-2}$ | -0.0100 | -0.0464 |
| $LNINFL_{t-1}$ | -0.0081 | 0.6325** |
| $LNINFL_{t-2}$ | 0.3265 | -0.7561*** |
| $R^2$ | 0.9983 | 0.9878 |
| RMSE | 0.0545 | 0.0723 |
| P>chi2 | 0.0000 | 0.0000 |

**Note:** ***, **, and * denote the levels of significance. Also, for the purposes of this study, only the variables of interest (market capitalisation and economic growth) are presented above.

The market capitalisation equation with the R-squared value of 0.9878 implies that about 98.8% of the variation in the market capitalisation is explained by its exogenous variables in the model. Also, for the economic growth equation, the R-squared value of 0.9983 means that 99.8% of the changes in the growth rate of the Zambian economy is influenced by variations in the exogenous variables in the model.

The first equation regressed economic growth on its own lags, on the lags of market capitalisation, foreign direct investment, inflation, and the level of money supply. Here, the endogenous variable has two lags used as exogenous variables. The first lag exhibited a positive impact and it was statistically significant. This implies that the current growth rate of the Zambian economy is strongly and positively influenced by its immediate past growth rate. However, the second lag was found to have a significant deleterious impact on the current economic growth. The main variable of interest; the market capitalisation has its lags not having a significant influence on the current economic growth. Thus, there seems to be statistical independence of economic growth from market capitalisation.

The coefficients of the foreign direct investment and the rate of inflation were also not statistically significant with respect to their dynamic relationships with economic growth in the current

period. Also, from the results displayed in Table 4, the levels of money supply a year ago and two periods ago were found to have negative and positive impacts on economic growth in the current period respectively, but these results were found to be insignificant. This study, therefore, opposes the findings of Dotsey *et al*. (1999) and Mayhew (2013).

In the second equation, market capitalisation was regressed on economic growth and also on some selected control variables. Regarding the results in the market capitalisation equation, it was discovered that economic growth a year ago has a significant positive relationship between the market capitalisation in the present year. Nonetheless, economic growth two years ago was found to relate negatively to the current market capitalization. Thus, the market capitalisation is dependent on economic growth when the economic growth is lagged either one or two periods.

Besides, the study indicated that current market capitalisation was positively and significantly influenced by its immediate past market capitalisation. On the other hand, the second lag of market capitalisation was found to be negatively related to the market capitalisation in the current period, and it was statistically significant at 1% level of significance. Also, the results demonstrated that foreign direct investment two years ago impacted negatively on market capitalisation in the present period, whereas foreign direct investment a period ago was found to positively relate to the current market capitalisation, although it was insignificant.

Moreover, money supply a period earlier has an insignificant negative impact on market capitalisation in the current period. Though the second lag of money supply has a positive effect on market capitalisation in the current year, it was not found to be significant at any of the conventional levels of significance. The study further found that the rate of inflation at lag one has a significant positive impact on the current market capitalisation. On the other hand, the rate of inflation at two periods ago has a negative and significant effect on the current market capitalisation in Zambia.

***Granger Causality Results involving all variables***

The Granger causality test results when certain variables concerned were used as control variables are presented in Table 5.

**Table 5: Granger causality test results including all variables**

| Endogenous variable | Null Hypothesis | Chi-squared | P-value | Direction of Causality |
|---|---|---|---|---|
| **LNRGDP** | (LNSMC) does not Granger cause (LNRGDP) | 2.1154 | 0.347 | No causality |
| | LNMS does not Granger cause (LNRGDP) | 2.8283 | 0.243 | No causality |
| | LNFDI does not Granger cause (LNRGDP) | 0.0554 | 0.973 | No causality |
| | LNINFL does not Granger cause (LNRGDP) | 27.561 | 0.000 | Causality |
| **LNSMC** | (LNRGDP) does not Granger cause (LNSMC) | 9.4405 | 0.009 | Causality |
| | LNMS does not Granger cause (LNSMC) | 0.5356 | 0.765 | No causality |
| | LNFDI does not Granger cause (LNSMC) | 0.3351 | 0.846 | No Causality |
| | LNINFL does not Granger cause (LNSMC) | 8.0350 | 0.018 | Causality |

| Endogenous variable | Null Hypothesis | Chi-squared | P-value | Direction of Causality |
|---|---|---|---|---|
| **LNMS** | (LNRGDP) does not Granger cause LNMS | 4.7741 | 0.092 | Causality |
| | (LNSMC) does not Granger cause LNMS | 1.3412 | 0.511 | No causality |
| | LNFDI does not Granger cause LNMS | 7.5606 | 0.023 | Causality |
| | LNINFL does not Granger cause LNMS | 3.8122 | 0.149 | No causality |
| **LNFDI** | (LNRGDP) does not Granger cause LNFDI | 0.27842 | 0.870 | No causality |
| | (LNSMC) does not Granger cause LNFDI | 0.4053 | 0.817 | No causality |
| | LNMS does not Granger cause LNFDI | 6.0104 | 0.050 | Causality |
| | LNINFL does not Granger cause LNFDI | 1.6032 | 0.449 | No causality |
| **LNINFL** | (LNRGDP) does not Granger cause LNINFL | 18.554 | 0.000 | Causality |
| | (LNSMC) does not Granger cause LNINFL | 0.3973 | 0.820 | No causality |
| | LNMS does not Granger cause LNINFL | 1.9595 | 0.375 | No causality |
| | LNFDI does not Granger cause LNFDI | 0.0625 | 0.969 | No causality |

The introduction of these control variables did influence the independence of the market capitalisation from economic growth. The observations made with economic growth being the endogenous variable showed that the null hypothesis that market capitalisation does not Granger cause economic growth was accepted; given the probability of 0.347. Thus, changes in economic growth are not explained by variations in market capitalisation. The implication of this result is that there exists no dependence of economic growth on the improvement in the market capitalisation. However, the null hypothesis that changes in economic growth Granger cause fluctuations in market capitalisation was rejected due to the p-value of 0.009. This means that there is a unidirectional causal relationship between market capitalization and economic growth which runs from economic growth to market capitalization in Zambia. The results, therefore, contradict the findings of Osamwonyi and Kasimu (2013) who indicated that in Ghana and Nigeria, there is no causality link between stock market development and economic growth; but in the Kenyan economy, there is bidirectional causality between stock market developments and economic growth. Again, the result contradicts the findings of Mazur and Alexander (2001), Azarmi *et al.* (2005), Sarkar (2007), Osuala *et al.* (2013), and Ofori-Abebrese *et al.* (2016) who indicated that there exists no causal relationship between market capitalisation and economic growth.

Also, the null hypothesis that the economic growth does not Granger cause variations in money supply was rejected at 10% level of significance, whereas the null hypothesis that the lags of

money supply do not Granger cause changes in economic growth was accepted due to the probability value of 0.243. Thus, there exists a unidirectional causality running from economic growth to the level of money supply in Zambia. This suggests that changes in money supply are not explained only by changes in its own lags, but also by the lags of economic growth. Yet, it was found that the variations in money supply do not influence economic growth during the period of the study. Similarly, foreign direct investment was found to have no predictive impact on economic growth.

Unsurprisingly, there is a bi-directional causal relationship between inflation and economic growth in Zambia. It was evident that the null hypothesis that changes in the rate of inflation do not Granger cause variations in economic growth was rejected at 1% level of significance. This implies that changes in the rate of inflation explain the variations in the growth rate of the Zambian economy. There is consistency in terms of the results since the null hypothesis that changes in economic growth do not Granger cause variations in the rate of inflation was also rejected, given the probability value of 0.000. The implication is that the variations in economic growth are explained not only by changes in its own lags but also by the lags of inflation and the opposite is also true considering the period of the study.

Additionally, the study found that short-run shifts in money supply have no significant predictive impact on the fluctuations in stock market capitalisation. The result contradicts the possibility that the level of money supply affects the share prices, hence influencing the number of shares issued. The finding disagrees with Keran (1971) who suggested that fluctuations in nominal money supply influences total expenditure, and as a result, impacting a corporate earning leading to fluctuations in share prices.

Finally, the null hypothesis of no causality from the rate of inflation to stock market capitalisation was rejected as a result of the probability value of 0.018. This implies that changes in market capitalisation are not explained only by the lags of market capitalisation but also by the lags of inflation. With the exception of inflation and economic growth, all other variables have no predictive impact on the stock market capitalisation during the period of the study.

***Impulse Response Function***

Impulse response function shows the dynamic responses of regressors in relation to the time of variation of regressand (Sims and Zha, 1999). The panel Figure 1 shows the impulse response function graph for the variables used in the VAR model.

The panel above figure 1 shows the impulse response of all endogenised variables to themselves and to other macroeconomic variables. For the purposes of satisfying the objectives of this study, the researchers first considered the response of market capitalisation to economic growth to find out the direction of causality among the variables. When the impulse is stock market capitalisation, there seems to be virtually no response of economic growth at the initial stages of the impulse to the third quarter time responsive period but exhibits a positive response afterward. When the impulse is inflation, every response of economic growth is all positive at each time responsive period. However, when the shock is foreign direct investment, there seems to be virtually no response from economic growth at all time responsive period. Also, when the impulse is the level of money supply, slightly more than half of the response of economic growth is negative.

A look at the panel reveals that the response of stock market capitalization shows a negative response from the first quarter to third quarter time responsive period, then it indicates positive response onwards when the impulse is economic growth. However, the panel reveals that a shock to inflation will influence stock market capitalisation to rise for a brief period, then maintains a constant positive respond afterward. The shock to foreign direct investment causes a little rise in stock market capitalization, and then maintains a constant positive response until it falls on the tenth time responsive period. The response of stock market capitalisation to shock in money supply is negative

at each time responsive period, except on the tenth period when stock market capitalization assumes zero response.

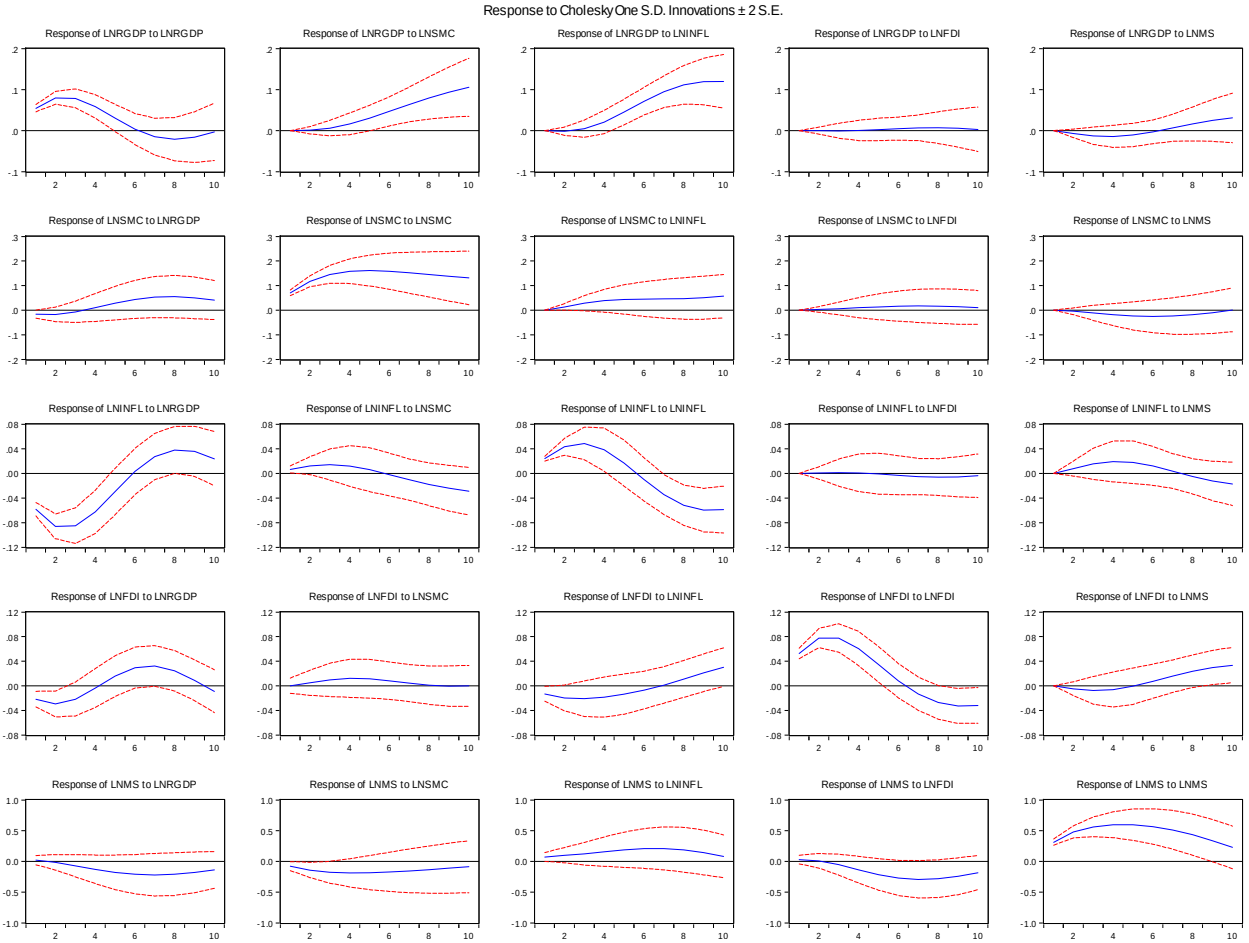


**Figure 1: Impulse Response Function**

## Conclusions

Stock market activities assume a crucial role in determining the level of economic activities in both developing and developed economies, by effectively facilitating capital for productive investments, providing a proper stage to incite best corporate practices that will bring about growing investments and hence leading to a rise in economic growth. However, the issue of whether or not there is a presence of a long-term interdependence between financial development and economic growth has not been empirically established. Another unsubstantiated area involves the association between stock market indicators and economic growth in the developing economies. Some studies have found a significant causal relationship between stock market development and economic growth, while others have indicated no correlation between stock market development and economic growth. As such, this study was premised on these debates to empirically examine the dynamic relationship between stock market development and economic growth with a particular focus on the Lusaka Stock Exchange (LuSE) in Zambia. Using vector autoregressive (VAR) model and Granger causality test on quarterly time series data spanning 1996Q1-2015Q4, the study discovered that there existed a unidirectional causality running from market capitalisation to economic growth. By

including certain macroeconomic variables as control variables, it was rather found that fluctuations in economic growth have significant predictive impacts on the current market capitalisation. The study further found that with the exception of inflation, changes in the level of money supply and foreign direct investment have no impacts on economic growth in Zambia.

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