Do Economic Policy Decisions affect Stock Market Development in Ghana?

Grace Ofori-Abebrese*, **Eugenia Amporfu and Daniel Sakyi**

Abstract

The Efficient Market Hypothesis proposes that macroeconomic policy actions do not influence stock market development but the Tobin's q theory argues otherwise. This paper uses the autoregressive distributed lag (ARDL) technique to investigate the impact of macroeconomic policy on the development of the Ghana Stock Exchange for the period 1991-2011. The paper finds government revenue and exchange rate reduce stock market development. A policy mix identified was that, the outcomes of government expenditure and government borrowing interest rate exert no influence on stock market development. For equity investors not to easily transfer their investments in response to changes in macroeconomic policies among others, the study recommends good macroeconomic management.

Keywords: Stock Market Development, Macroeconomic policy, Government spending, ADRL, Ghana, West Africa

JEL Classification: G2, E 6.

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* Corresponding Author. *Department of Economics, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, Email: ofori35@yahoo.com.*

1.0 Introduction

As stock markets grow broader and deeper in both developed and developing countries, a critical question that one asks is how government policies and institutions affect equity-market performance across countries. According to Lavelle (2004) and Sobel (1994) public and private sectors interact in the stock market for the acquisition of funds. Armijo (1999) and Obstfeld and Taylor (2004) also argue that, openness in the capital market provides governments with greater access to capital, since it allows them to sell their policies not only to voters, but also to (often foreign) investors. IMF (2006) firms this up by reporting that out of the world's GDP of $41.3 trillion in 2004, the total size of outstanding public debt securities were $23.1 trillion.

Imran Ali (2009) has outlined factors such as expansion in the country's economic activities, strength in the exchange rate, and decrease in lending interest rates and improvement in recovery of outstanding loans among others as having impact on the performance of stock markets. According to Jensen (2008), investors respond to policies and institutions so governments whose economy relies heavily on the stock market to finance its expenditures may face greater pressures for fiscal and monetary tightening especially when market capitalization of the stock market is relatively low (Mosley 2003). Garcia and Liu (1999) has explained that volatility in economic policies has significant impact on the performance of stock market. The reason is that, unexpected changes in monetary policy, fiscal policy, exchange rate policy and trade policy influence the profit situations of corporations.

In addition, Pardy (1992) asserts that macroeconomic and fiscal environment are deterministic factors of the success or otherwise of the securities market. Thus, a stable macroeconomic environment enhances business activities which impel them to access securities for sustained growth. Agenor (2000) highlights that high inflation, large fiscal deficits and real exchange rate over-valuation constraint private sector investment and savings and cause inefficient allocation of resources on the stock market which eventually affect its performance. Changes in interest rates compel investors to alter their portfolio investments. For instance, low interest rate on bank deposits or bonds would make investment in stocks more profitable and raise share price of affected equities on the exchange thereby enhancing the performance of the exchange. Fluctuation in the exchange rate also impact on the performance of stock exchange market.

Depreciation can result in outflow or capital flight which will deprive the stock exchange market and other domestic investment of fund. Fiscal deficits result in government interference in the financial markets with more attractive instruments. According to Pilbeam (1992) when government treasury bills rates are high, investors' re-adjust their portfolio balances and transfer domestic funds from the stock market to money market.

Moreover, studies such as Tobin (1969) and Blanchard (1981) among others insist that the outcomes of fiscal policy may cause changes in the rate of interest which would influence investors to revalue their portfolio and thus affect stock market development. According to Tobin (1969) the returns on stock serve as a linkage between the real and the financial sectors of an economy. He asserts that budget deficits lead to monetary growth and these have important implications on stock returns. He therefore concludes that fiscal policy actions do matter in stock market development. Blanchard (1981) also argues that fiscal policy being discretionary or non-discretionary may affect stock market returns due to associated policy lags.

Rogalski and Vinso (1977): Darrat and Brocato (1994); Bordo and Wheelock (2004); and Laopodis (2006) theoretically explain that the outcomes of fiscal policy actions (budget deficits or surpluses) such as changes in government expenditure or taxes are important determinants of asset prices. For instance, when government increases its tax rates with government expenditure unchanged, investors would be discouraged from further investing in the stock market and this would lower asset prices and returns which compels investor to revalue their portfolio. Muscatelli *et al*. (2004) also explain that the outcome of expansionary fiscal policy is often accompanied by accommodative monetary policies, which lower interest rates and therefore dampen their estimated response to the fiscal shock.

Stock Market Performance is influenced by the domestic economy's national income, monetary issues, political stability, international relations, balance-of-payment situation and others and company-specific issues. For instance, projected economic growth of the economy, positive monetary outlook of the central bank, decrease in fiscal deficit, good performance of a company in terms of profit, sales, among others, result in a bullish stock market. In the stock market, falling interest rates increase earnings because companies spend less maintaining their debts and

investors buy more stocks to earn an acceptable rate of return. When interest rates get very high; fewer investors are interested in stocks.

Humpe and Macmillan (2009) concluded that monetary policy affects stock market through the wealth effect. Increase in money supply lowers interest rate, makes investment in bonds unattractive and therefore raises stock prices and therefore increases the wealth of households. Hamburger and Kochin (1971) also argue that equities respond to monetary disturbance through an interest-rate effect, a corporate-earnings effect or a risk-premium effect. The works by Abdalla and Murinde (1997): Gunduz and Hatemi-J (2002) and Hatemi-J and Irandoust (2002) through the portfolio approach established that changes in stock markets influence exchange rates. Bahmani-Oskooee and Sohrabian (1992) and Granger, Huang and Yang (2000) stress that a rise in stock prices increase the domestic wealth of investors and facilitate a rise in the demand for money. Following the consequent rise in interest rates, capital is attracted into the domestic economy, appreciating the domestic currency. In addition, foreign portfolio investors pay close attention to timing their return conversions based on the anticipated exchange rate movement. Kasman (2003) indicates that stock indices and exchange rates move together in the long-run.

Empirical studies such as Robert (2008): Wongbampo and Sharma (2002) and Diacogiannis *et al.* (2001) have shown that changes in stock prices are linked with macroeconomic behaviour in advanced countries. Mayasami and Sims (2002) and Nasseh and Strauss (2000) have spelt out that macroeconomic variables including inflation, money supply and exchange rate determine stock prices.

However, Gan *et al.* (2006) base their study on the Efficient Market Hypothesis (EMH) and confirmed that stock market index does not reflect changes in macroeconomic variables. The proponents of EMH, Samuelson (1965) and Mandelbrot (1963) have argued that fiscal policy actions have no effect whatsoever on stock market activity since economic agents fully incorporate all publicly available information including fiscal policy information in their decision making. If this theory is applied to the stock market, it indicates that existing share prices always incorporate and reflect all relevant information and stocks therefore trade at their fair value on stock exchanges. The studies of Fama (1970; 1991) and Davidson and Froyen,

(1982) confirm this by concluding that stock prices fully reflect all publicly available information. The studies of Cooper (1974) and Rozeff (1974) also concluded that changes in money supply should not have any impact on stock market development.

Barro (1974) used the Ricardian equivalence proposition to explain that fiscal policy actions have no effect on stock market activity. The Ricardian proposition states that rational individuals anticipate future tax liabilities, resulting from current and expected deficits, and thus fully discount them currently. Here, investors are aware that any future government fiscal debt would be financed by future increases in taxation and would therefore not readjust their portfolios. Thus, if investors correctly discount future tax increases from current tax decreases, their worth would be unaffected and fiscal deficits would not influence their investment decisions.

Stock markets all over the world are regarded as financial institutions that raise long term funds to finance investment so as to achieve high-economic growth and hence development. Delving into the influence that macroeconomic policy has on the development of stock market is therefore imperative. Moreover, trends in macroeconomic variables in Ghana seem to have a link with the development of the Ghana Stock Exchange (see Kyereboah-Coleman and Agyire-Tettey (2008) and Adjasi *et al.* (2008)). Therefore whether economic policy has any effect on stock market activity or not is fundamentally an empirical question.The paper aims at examining the impact of macroeconomic policy on the performance of the Ghana Stock Exchange. It will also identify the policy mix necessary to enhance stock market growth.

Although some studies have been done in this area of study, none focused on the entire macroeconomic policy variables in a single study. Kyereboah-Coleman and Agyire-Tettey (2008) studied the effect of bank lending rates on stock market performance. The paper concluded that bank lending rates have adverse effect on stock market index. Adam and Tweneboah (2008) concentrated on foreign direct investment, Treasury bill rate, consumer price index, average oil prices and exchange rates and found a long-run relationship between these macroeconomic variable and stock prices in Ghana. Adjasi *et al.* (2008) also analyzed the effect of exchange rate volatility on stock market and found a long-run relationship between macroeconomic variable and stock prices. It is therefore clear the current paper assesses the

development of stock market from a different perspective, providing a spring board for further studies in this area.

2. Methodology

2.1Model Specification

The model for the study is specified as follow:

$$MC = f(GE, GR, M2, INTR, RER) \tag{1}$$

(GE and GR represent fiscal policy, M2 and INTR represent monetary policy and RER represent exchange rate policy).

Where: MC is market capitalisation (proxy for stock market development), GE is government expenditure, GR is government tax revenue, $M2$ is broad money supply, $INTR$ is interest on domestic bonds and RER is real exchange rate.

A log-linear functional specification is given as:

$$\ln MC_t = \beta_0 + \beta_1 \ln GE_t + \beta_2 \ln GR_t + \beta_3 \ln M2_t + \beta_4 \ln INTR_t + \beta_5 \ln RER_t + \varepsilon_t \tag{2}$$

Where: all variables are as previously defined except ε, which represents the usual error term, t, is time, $\beta_i (i = 1, 2, ...5)$ are the coefficients of the explanatory variables. ln denotes natural logarithm, β_0 is the coefficient of the constant. Variable definition, measurement, as well as expected signs are provided in Table 1 in the Appendix.

2.2 Data type and Sources

Annual time series data for the period 1991–2011 was used for the study. The data on market capitalization was taken from the Ghana Stock Exchange and World Development Indicators of the World Bank. Data on money supply, government expenditure, government tax revenue, interest rate and exchange rate were also taken from the Bank of Ghana annual bulletin for various years, the various issues of the State of the Ghanaian Economy, Ghana Statistical Service and World Bank's World Development Index (2012). The econometric tests and estimations were carried out using Eviews 7.1 and Microfit 5.1.

2.3 Estimation strategy

The estimation strategy begins with the examination of the stationarity properties of the variables in equation (2). This is necessary to ensure none of the variables is integrated of order two (I [2]) or even more, and also ensure estimates obtained are not spurious. Unit root investigations are done using the (DF-GLS) de-trending test proposed by Elliot *et al.* (1996). The paper tests the null hypothesis of unit root against the alternative hypothesis of no unit root. The test is done using a constant but no trend and a constant and a trend, at the levels and first difference. Next, the study examines cointegration using the autoregressive distributed lag (ARDL) bounds test technique and the error correction model (ECM) proposed by Pesaran *et al.* (2001). This method is appropriate for small sample study as well as for variables that are integrated of strictly order zero or one (i.e. I [0] or I [1]) or a mixture of the two. The null hypothesis of no cointegration is examined against the alternative hypothesis of cointegration. The decision is reached by comparing the F-statistic obtained from the estimation with the upper and lower critical bound values provided. There is cointegration if the F-statistic is greater than the upper bound critical value and there is no cointegration if the F-statistic is less than the upper bound critical value. There is inconclusive evidence of cointegration if the F-statistic falls between the upper and lower critical bounds values. As already stated, the ARDL and ECM are adopted to obtain long- and short-run estimates following evidence of cointegration.

3. Results and discussions

3.1 Unit root test results

The study employed Dickey-Fuller generalised least square (DF-GLS) de-trending test proposed by Elliot *et al*. (1996) to test for unit root in the variables. Results of the unit root tests are presented in Table 1. It must be noted that the test regression included both constant and linear trend as well as constant with no linear trend for the level as well as first difference levels of the variables. The lag length is selected using the Schwartz Information Criterion.

Table 1: DF-GLS Unit root test results

Variable	Level		First Difference	
	Constant	**Constant and Trend**	**Constant**	**Constant and Trend**
ln MC	-2.134**	-2.362	_	-3.371***
ln GE	-0.381	-6.303***	-3.527***	_
ln GR	-0.631	-1.880	-3.062***	-3.491***
ln $M2$	-0.153	-1.704	-4.034***	-4.556***
ln $INTR$	-0.280	-3.439***	-3.776***	_
ln RER	-1.806	-2.619	-3.849***	-4.007***

Note: ***, ** denotes the rejection of null hypothesis of unit root at the 1 and 5 per cent levels of statistical respectively

The DF-GLS test indicates government tax revenue, government expenditure, broad money supply, interest rate and real exchange rate are first difference stationary, implying they are integrated of order one (I[1]) when the test is done with a constant but no trend. Market capitalization is however, stationary at the levels, hence, integrated of order one (I [1]) when the test is done as described earlier. When the test is done with a constant and a trend, government expenditure and interest rates are stationary at the levels (hence, I [0]), while all other variables are stationary after first differencing. The unit root results imply the variables are stationary at least after first differencing. Hence, estimating the variables in equation (2) will not yield spurious results. Moreover, the mixed stationarity properties of the variables makes the using of the ARDL bounds test approach to investigating cointegration and subsequently obtaining long- and short-run results relevant and appropriate.

3.2 Cointegration test results

To test for a long-run relationship among the variables, the Bounds Test approach to cointegration was used. The results are presented in Table 2. The Schwarz Information Criterion was used to select the optimal lag length of the ARDL model. The optimal lag length used is lag 1.

Table2: Results of the Bound Test for Cointegration

Test Statistic	4.349187**

**Note: ** ** indicates the rejection of the null hypothesis of no cointegration at 5 per cent level of statistical significance. The ARDL model gives the 95 per cent upper and lower bound values as 2.62 and 3.79 respectively

From Table 2, the calculated F-statistic that the joint hypothesis of the lagged level variables of the coefficients is zero equals 4.349187. This figure is greater than the upper bound critical value at 5 per cent level of statistical significance (3.79). This means that the joint null hypothesis of all the lagged level variables of the coefficients being zero is rejected even at 5 per cent. This suggests that there is cointegration between market capitalisation and the independent variables.

3.3 The estimated long-and short-run results

With results of the Bound test clearly depicting long-run cointegration relationship among the variables, the ARDL was used to estimate equation (2). The long-and short-run results are shown in Tables 3 and 4, respectively.

Table 3: Estimated long-run coefficients using the ARDL approach

Regressors	Coefficient	Standard Error
$\ln GE$	0.71196	1.0051
$\ln GR$	-5.4694***	1.1702
$\ln M2$	3.3616***	0.84659
$\ln INTR$	0.58656	0.86189
$\ln RER$	-3.7577**	1.4674
C	43.9663**	13.3881

Note: ***,** indicates statistical significance at 1 and 5 per cent levels of statistical significance respectively

From Table 3, government expenditure is revealed to have a positive impact on stock market development. The coefficient is however not statistically significant. This is not surprising as more often than not government consumption expenditure levels are higher than its investment spending. It is however the latter that likely enhances activities of firms and as such the stock prices of their firms. However, government expenditure has a negative and significant impact on stock market development in the short-run (see Table 4). This is in contrast to the positive but insignificant result obtained in the long-run. This may be explained by the fact that government consumption expenditure may increase the level of economic activity and exert pressure on interest rate through increases in money demand and reduce stock prices in the short-run. The short-run and long-run results indicate that fiscal policy actions influence stock market development in Ghana. This finding confirms the conclusions of Bernhard and Leblang (2006) and McGillivray (2003).

Government revenue has a negative and statistically significant impact on stock market development in the long-run. The coefficient of GR is statistically significant at 1 per cent level of significance. This empirical finding conforms to the a priori expectation of the paper and reiterates the conclusion made by Laopodis (2006). That is, government increases its tax rates

with government expenditure unchanged, investors would be discouraged from further investing in the stock market and this would lower asset prices and returns. With the increases in tax rates in the country, high tax on capital gains may discourage investors from actively trading their shares and this may dampen the activities of the secondary market of the stock market and for that matter market capitalization. The short-run coefficient of government revenue is also negative but statistically insignificant.

Consistent with theory, broad money supply has a positive and significant impact on stock market development for the study period. The coefficient of $M2$ is statistically significant at 1 per cent level of significance. Increases in money supply depress interest rate which make investment in stocks more attractive and thus boost market capitalization. This confirms the study of Humpe and Macmillan (2009) and Park and Ratti (2000) which used the interest rate channel of transmission mechanism of monetary policy and concluded that changes in money supply initiate changes in interest rate. This causes changes in the wealth of investors and compels them to revalue their equity holdings. The short-run coefficient is also positive and statistically significant at 10 per cent level of significance.

Interestingly contrary to theory, interest on domestic debt ($INTR$) has a positive impact on stock market development. However, the coefficient is not significant. It also confirms evidence provided by Ologunde, Elumilade and Asaolu (2006) for Nigeria. The short-run results are similar to that of the long-run.

Contrary to the theoretical relationship between exchange rate and stock market development, the results of this paper reveal that real exchange rate impact negatively on stock market development in Ghana. The coefficient of RER is statistically significant at 5 per cent level of significance. Invariably, the continuous fall in the value of the cedi, enhances stock market development. This outcome confirms evidence provided by Adjasi *et al.* (2008) for Ghana. This relationship may be explained from the fact that depreciation increases the cost of outflows which compels domestic investors to patronize the stocks of the exchange. The short-run results confirm that of the long-run even though the short-run result is significant at 5 per cent level of significance.

Table 4: Short-run results using the ARDL approach

Regressors	Coefficient	Standard Error
$\Delta \ln GE$	-2.7886***	0.77693
$\Delta \ln GR$	-1.7493	1.9272
$\Delta \ln M2$	1.2725*	0.6396
$\Delta \ln INTR$	0.58656	0.86189
$\Delta \ln RER$	-3.7577**	1.4674
$ecm(-1)$	-0.5213***	0.1456

Note: ***,**,* indicates statistical significance at 1, 5, and 10 per cent levels of statistical significance respectively

The policy mix identified here is that in the long-and short-run, the outcomes of government expenditure and government borrowing interest rate do not impact on stock market development.

The error correction term which shows the speed at which adjustment occurs in the long-run equilibrium is negative and significant at 1 per cent level as expected. From the results in Table 5, the estimated coefficient of the error correction model is –0.5213. The negative coefficient of the $ecm(-1)$ confirms the existence of long-run equilibrium relationship of the model. This is an indication of joint significance of the long-run coefficients. Since the absolute value is less than one, it indicates a stable error correction mechanism which eventually converges to the long-run equilibrium level even when there is a deviation from the short run equilibrium level. The speed of adjustment to the long run equilibrium level is 52 per cent as shown by the coefficient of the error correction term. This reflects a relatively very high speed of adjustment to equilibrium after a shock. This is because approximately more than 52 per cent of disequilibria from the previous year's shock converge back to the long-run equilibrium in the current year.

4. Conclusions and policy implications

The study found a negative but significant relationship between government revenue and stock market development. Government expenditure was revealed to have a positive impact on stock market development. This indicates that fiscal policy in Ghana exerts influence on stock market development. Broad money supply has a positive and significant impact on stock market development. The government borrowing interest rate does not impact on stock market development. The long-run and short-run analysis of the study also reported a negative relationship between real exchange rate and stock market development of the Ghana stock exchange.

With these results, it is important to highlight that there is the need to implement prudent macroeconomic policies in order for the country to derive maximum benefits from stock markets. With the negative effect of government revenue on the development of stock market, it is prudent for the Ghana Revenue Authority to research and identify varied tax base to increase government revenue in order to reduce tax rates on few sources.

The Institute of Statistical, Social and Economic Research (ISSER) (2003) stated that the main source of employment in Ghana is the informal sector. It provides employment opportunities for at least 80 per cent of the labour force. According to the 2010 population and housing census (Ghana Statistical Service (May, 2012)) the private sector is the largest employer in the country, accounting for 93.1 per cent of the economically active persons (private informal, 86.1 per cent and private formal, 7.0 per cent). The public sector, which is the second largest employer, accounts for only 6.3 per cent. A survey conducted in Accra by Jobs and Skills Programs for Africa (JASPA) in 1990/91 established that the informal sector accounts for about 22 per cent of Ghana's real GDP (ISSER 2003). This presupposes that this sector makes significant contribution to the Gross Domestic Product (GDP) and so the sector could equally make a major contribution to the tax revenue instead of depending on the 13.3 per cent formal sector. This is because high taxes on few sources reduce investors' disposable incomes and for that matter funds for investment in stocks.

Government expenditure was revealed to have positive but insignificant influence on stock market development. Government consumption expenditure far exceeds its investment expenditure which enhances stock market development. The paper suggests that policy makers manage consumption expenditure. In addition, polices such as tax rebates, tax concessions given to foreign counterparts should be accorded to domestic entrepreneur to boost activities of the private sector. This can also help them to employ more people which may help reduce public sector employment in order to reduce personal emoluments being paid by the government.

Although interest rate on government bonds does not have any adverse impact on the stock exchange, the paper cautions policy makers on the spillover effects. When interest rate on government bonds is high, it may deprive the stock exchange of foreign investors especially new ones. It could be possible that investors are not selling their existing shares in order to buy bonds but they are buying bonds instead of buying new shares or adding to their portfolio.

The finding that real exchange rate impacts negatively on stock market development hints that the number of investors who will convert their dividends into other currencies may not be many on the exchange. This calls for more education and efforts to attract more foreign capital to boost the activities of the exchange. Studies such as Borensztein *et al.* (1998) and Levine (1999) have expressed the urgency of having access to foreign capital inflows. The presence of foreign investors on the exchange promotes capital accumulation and better corporate governance which indirectly reduces the cost of internal and external finance. It also exerts pressure to upgrade trading systems and modify legal frameworks to support a greater variety of financial instruments.

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Table 1: Description of variables

Variable	Definition and Measurement	Theoretical base/Expected sign
Market size	Measured as the ratio of market capitalization to GDP.	
Government expenditure	Measured as general government final consumption expenditure.	Muscatelli et al. (2004) +
Government revenue	Measured as central government revenues excluding grants	Laopodis, (2006) -
Money supply	Measured as M2	Friedman (1988) +
Interest rate	The paper considers interest on government bonds.	Pilbeam (1992) -
Real exchange rate	Measured as real effective exchange rate	+