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# Fiscal Policy, Monetary Policy and Stock Market Development in Ghana

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## Abstract

Abstract- The purpose of the paper is to investigate the influence of fiscal and monetary policy on stock market development in Ghana. The study adopted quantitative approach. Dynamic OLS regression technique was used for running the formulated model as well as Toda-Yamamoto Granger no-causality approach for the causal relationships. The first hypothesis fiscal policy (inflation) revealed a positive and significant effect on stock market development. The second hypothesis also revealed a negative and significant relationship between interest rate and stock market development. Monetary policy rate revealed a positive and significant relationship with stock market development. Thirdly, the causal model analyzed found two bi-directional relationships: between interest rate and monetary policy rate; and inflation and government revenue. The study recommends incorporate of both fiscal and monetary policies in a single model as their interaction exerts significant effect on the stock market development. Also, the study recommends moderate inflation which would propel the stock market to expand as the share prices increases.

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**Index terms**— single-digit inflation, dynamic ordinary least squares (DOLS), fiscal policy, monetary policy, stock market development,

## 1 I. Introduction

he impact of economic indicators on stock market prices has been a subject of investigation. This investigation is centered on varied theoretical postulations and inconsistent empirical evidences. Another issue has to do with the size and nature of this impact (Amarasinghe, 2015). The economic theory suggests that stock market development should reflect the expectations in the fiscal and monetary policies changes. Thus, for fiscal and monetary policies to be formulated correctly, the causal relations and dynamic interactions among the underlying economic indicators and stock market are very important.

Stock market is characterized by brokers who trade with shareholdings of listed firms (Karmal, 2013). In spite of the numerous studies on stock markets, there is still no consistent economic variable that have been approved as the only variable to measure stock market development. According to (wokoye and Oti (2018) using different types of indicators would reveal findings that would be consistent. Stock market development is described as a complex concept and this may be the reason for the varied variables applied in measuring it. Stock market development provides a plethora of advantages when it is established. Some of the merits include: ready access to capital, enhanced the firm's profile, attract high quality employees and finally it increases the firm's visibility when the IPO was a success. (Kunofiwa, 2018).

According to Havi and Enu (2014), fiscal policies can be grouped into number of applications. That is, expansionary fiscal policies and contractionary fiscal policies. Expansionary fiscal policy is adopted when an economy is experiencing a recession. The government in this case would lower tax rates and increase expenditure to cause an increase in the country's growth. The impact of this is that when producers and consumers pay lower taxes, they have more funds to spend, save and invest. This boosts aggregates demand or economic growth. Thus, governments seek their country's expansion by increasing expenditure. This is done by building more infrastructures such as schools, hospitals, roads and other essential capital-intensive projects. On the other

# 1 I. INTRODUCTION

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45 hand, contractionary fiscal policies are adopted in the face of galloping inflation. The government reduces its  
46 expenditure, basically through spending within the thresholds of its revenue.

47 In most countries, the government or the central bank decides on how much money should be circulated in the  
48 financial system. The US adopt a quasi-approach where the current government in power in conjunction with the  
49 central bank decides on how money to circulate, although it is the central bank that print the money. Government  
50 all over the world is face with monetary policies that would be suitable if applied well in the economy. Monetary  
51 policy is how the central bank or the government governs the money in circulation and prevailing interest rate in  
52 the country. Monetary policy is formulated based on inputs gathered from various macro-economic indicators,  
53 Geopolitical development, concern group's government and other credible sources (Cioran, 2014). The role of  
54 fiscal policy, monetary policy and stock market development are support by some theoretical arguments. Some  
55 of these theories may include efficient hypothesis, keynsian theory, fisher theory, and arbitrary pricing theory  
56 ??McCallum, 1974; Akosah, 2015; ??pho, 2016; Amata, Muturi & Mbewa, 2016). These theories argue out varied  
57 assumptions about the relationships among these subjects. For instance, the efficient market hypothesis has it  
58 that there is an insignificant relationship among these variables whereas arbitrage pricing theory opined that  
59 there is a significant association between these variables under consideration (Ball, 2009; ??nghelache, Jakova &  
60 Oanea, 2016).

61 Aside this, there is the empirical studies, which demonstrate that the study variables are still related and that  
62 prior studies have been conduct by some scholars in Ghana. These prior studies may include that of Antwi,  
63 Xicang and Mills (2020); Asante, Amporfufu and Sakyi (2017); Ofori-Abebrese (2016); Quartey (2014) and others  
64 on fiscal policy, monetary policy and the stock market development. However, both theoretical and empirical  
65 studies provide evidences which depict mixed results and as such further research in this subject area is still  
66 relevant (Ofori-Abebrese, 2016). Thus, this study views fiscal and monetary policy to be closely related and are  
67 at times they are referred to as sister policies ??Do & Need, 2020). This is because in both variables are aimed  
68 at achieving macroeconomic objectives. These objectives include, controlling inflation, consumption, boosting  
69 growth and liquidity.

70 The central banks of developed countries had to implement directives that prove to be different from what  
71 they were doing the past. They provided liquidity to a variety of agents including deposited taken institutions,  
72 money market and insurance companies. They also bought massive of governments bonds. These actions were  
73 necessary to boost aggregates demands. The central bank came to the realization that, a low and stable inflation  
74 rate was a necessary condition but not a sufficient condition for the stability in the economy. Thus, these central  
75 banks in their hard times did followed directives and regulations that were much less transparent and much less  
76 measurable than just a change in the policy rate ??Mishkin& Eakins, 2012). In addition, some directives and  
77 regulations issue out by the central banks may results the decline in economic growth due to a potential crisis they  
78 have envisage or forecasted. This action can spring up political pressure, on them. And in some cases, sovereignty  
79 of the apex bank was questioned. Although, the apex bank had the mandate of controlling the economy, two  
80 problems are seen here. One is implementing policies that are quite different from everyday policies that they  
81 implement. And two, having the government in power controlling and enacting policies (political economy) while  
82 the central bank is sidelined (Giannoulakis, 2017).

83 In Ghana, the central bank, Bank of Ghana has the mandates to pursue sound monetary policies that would  
84 result in a stable price and create employment and also create an enabling environment for continues economy  
85 growth. The price stability is explained to mean the medium-term inflation target 8% percent with a symmetric  
86 bond of + or -2 (%) percent. To achieve this target, the Bank of Ghana implement suitable monetary and  
87 fiscal policy framework is based on Inflation Targeting (IT). Inflation targeting is described as the application  
88 of policy rate as the main policy tool that provides guidance on monetary policy and ensuring stable inflation  
89 ??BoG, 2019). The fiscal development in Ghana in first quarter of 2019, revealed revenue short falls of 1.8%.  
90 The revenue under-performance was largely attributed to lower than expected cost-insurancefreight (CIP), using  
91 zero-rated cost-human-freight and tower-than anticipated personal income taxes. Furthermore, the 2019 annual  
92 fiscal and monetary reports revealed that monetary developments in the country were modest and consistent  
93 with the disinflation process. The reserve money growth was moderated in 2019 as compared with 2018. Annual  
94 growth in reserve money was reduced by half to 7.9% as compared with 14.8% in 2018. The increase in reserve  
95 currency was due to an increase in net foreign assets, which was offset by a decline in net domestic assets in the  
96 comparative period. The annual growth in broad money (M2+) grew by 18.5% in 2019. This growth in total  
97 liquidity reflects an increase in NFA. That notwithstanding, inflation remain within the medium-term target  
98 band of 8% + or -2%, as some marginal increases in inflation occurs, which is driven by passthrough effects of  
99 the currency depreciation. In same year the monetary policy rate remained unchanged that is 16% as compared  
100 with 18% in 2018 (BoG report, 2019).

101 Stock exchange composite index continued to trend downwards mainly by underperformance of banks due to  
102 the impact of the financial sector clean-up exercise. In 2019, the index was 32.82 as compared with 84.03 in  
103 2018. This decline caused the market capitalization to fall by 0.41. There is no doubt that the fall was a very  
104 significant loss in value of stocks. Evidently, these facts and figures indicate that fiscal and monetary policies  
105 are truly subjects of great importance in Ghana and its development as a nation. And policies and directives  
106 have an important relationship with stock market development. Also, these may be detrimental if it's wrongly

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107 applied. In light of these developments, this study seeks to examine the influence of fiscal and monetary policy  
108 on stock market development.

109 Additionally, this study seeks to fill a gap by examining the causal relationships that exists among the study  
110 variables. This is made possible by employing a robust technique known as Toda-Yamamoto estimation technique  
111 after employing standard vector-autoregressive (VAR) framework. The study would verify the The rest of the  
112 paper is organized as follows: theoretical literature, empirical literature, lessons learnt and gap summary, section  
113 2 outlines the method used; section 3 presents data source and properties; section 4 also presents empirical results  
114 and discussion; and Section 5 ends with the conclusion.

## 115 2 II. Theoretical Literature

116 The Keynesian theory was built around the assertions by John Maynard Keynes. Back then in the 1930s, he  
117 tried on several counts to use this theory to grasp the premises causing Great Depression. The theory essentially  
118 talks about the fact that, government can impact productivity levels in the macro-economy through the increase  
119 or decrease of taxes and expenditures. He argued that whenever government expenditures are increased through  
120 huge capital infrastructural expenditure, incomes are pumped into the pockets of the citizenry which in turn  
121 cause an increase in the overall economy. The theory also supports the fact that there is no one powerful tool  
122 that can move productivity and employment to the highest level. The Keynes concept is a broad concept where  
123 deployment of funds could be used to influence a country's sources of funds. The policy rate transmits by means  
124 of the rate of interest and focused on traditional Keynesian version of money for real interest rate movement.

125 Interest rate channel is a major way by which policy rates decisions that have implications on the economy  
126 are made. According to this channel, a change in the rate of interest will cause a change in the required rate of  
127 return, which in turn will affect the present value of the firms' future net cash flows, in this way, a high rate of  
128 interest will cause a low present value of future net cash flows, which in turn affects the present value of firms;  
129 future net cash flows (Chatziantoniou, Duffy & Filis, 2013).

130 Credit Channel is another monetary policy transmission medium. It has it that the Apex bank alteration  
131 of the rate of interest is the medium through which investment decision can be made. Thus, the share prices  
132 of firms on the exchange are determined by the level of corporate investment. This assertion by the Keynesian  
133 theory implies that where there is a rise in the firms' investments, automatically the firms' future cash flow would  
134 rise as well; thereby causing an upward movement of the demand for the firm's shares, this in turn pushes the  
135 firms' market value upward and by extension the stock price. On the other hand, if there is a fall in investment,  
136 market value of the firms' share prices also falls. Evidently, investment and market value are directly related  
137 (Adam & Tweneboah, 2008).

138 Equally, wealth effect is another transmission mechanism that affects stock market values of firms. The wealth  
139 effect asserts that when there is a rise in the cost of borrowing; fixed asset' value would depreciates. Likewise for  
140 share prices, the price falls. In similar way, the ability of the rate of interest to determine stock prices is such  
141 that an increase in the rate of interest will cause stock prices to fall.

142 Another transmission mechanism is the exchange rate. The exchange rate indicates the manner at which the  
143 rate of interest influences share prices. The effect of monetary policy on the stock market is expounded by the  
144 effect of the rate of interest on the foreign exchange system. In particular, an increase in the interest rate will  
145 lead to an increase in the domestic exchange rate, resulting in an increase in imports and decrease in exports.  
146 If imports are high and exports are low, this affects local industry and it leads to lower production; ultimately,  
147 it leads to lower commodity prices. Tobin (1969) argued that a higher rate of interest would lower the market  
148 value of firms listed on the stock exchange market.

## 149 3 III. Empirical Literature

150 Fiscal policy influences the price of listed firms' stock through the crowding out effect and aggregate demand effect,  
151 thus pushing prices of stock higher (Nwaogwugwi, 2018). This empirical study is very vital to the study. This is  
152 because there is an ongoing debate on whether to consider fiscal policies and monetary policies separately when  
153 making policy decisions or they are to be considered tandem. This calls further analysis and more investigation  
154 to reveal more conclusive evidences. This study provided evidence by estimating causality between the proxies  
155 for fiscal and monetary policies respectively. One major study done in Ghana by Havi and Enu (2014) digressed  
156 from stock market development but rather used economic growth. As such our attention is on the factors used  
157 in the study which includes money supply and general government consumption were the independent variables  
158 to that served as proxies for monetary policy and fiscal policy respectively. They also applied Ordinary Least  
159 Square (OLS) approach which in most case are associated with spurious results because the variable applied are  
160 not stationary. Their findings revealed that monetary policy relates positively to economic growth. The current  
161 study followed they in using money supply as measure for monetary policy, but it went further applied a different  
162 by estimating technique called Dynamic OLS instead of the ordinary least square (OLS).

163 Idowu, Bamidele, and Elumah (2020) examined the effects of monetary and fiscal policy on the stock market.  
164 Data on monetary and fiscal policy variables cover the period from 1985 to 2017. An ex-post facto research  
165 project was used. Monetary and fiscal policy

variables used were monetary policy rate, broad money, exchange rate, government revenue as a share of GDP, government spending as a share of GDP, and government budget balance as a share of GDP. The study shows that there is a long-term relationship between monetary policy, fiscal policy and the stock market. This indicates that fiscal and monetary policies have a significant impact on the stock market. This study used similar proxy variables when dealing with the research variables, but if the results prove to be similar, then a similar conclusion will be drawn, otherwise it remained inconclusive.

In addition, Nwaogwugwu (2018) studied the effects of macroeconomic policies and stock market behavior. He used ARDL frontier test and the results showed that money supply, government spending, taxation, and interest rate have a long-run and short-run relationship with the stock market. Similarly, Prukumpai and Sethapramote (2019) use structural vector autoregression (SVAR) models to estimate the effects of monetary and fiscal policies on the Thai stock market. Although they use different methods, they arrived at the same conclusion. They conclude that fiscal and monetary policies are related to the stock market. The first quarter shows that monetary policy has a greater impact on the stock market. The fiscal policy sector also shows that fiscal policy affects the stock market in the second and third quarters. The impact of fiscal policy is faster but shorter in duration compared to the impact of monetary policy. Thus, we can conclude that the Prukumpai and Sethapramote study supports the argument that fiscal and monetary policies go hand in hand, and the expectations of this study are also correct.

In the United States, Mbanga and Darrat (2015) studied the short-and long-term effects of fiscal and monetary policies on U.S. stock returns. Their findings suggest a strong long-run connection between stock prices and fiscal policy. For monetary policy, the results are reversed. Further tests show that fiscal policy is the main driver of relative stock market activity. While the results confirm this judgment and suggest that fiscal policy is transmitted through the stock market to the real economy. On the other hand, they do not indicate whether monetary policy is related to the stock market. Thus, the research in this area has been inconclusive and has not supported the consistent claim that the two policies move together. This contrasts with Idowu, Bamidele, and Elumah's (2020) study, which examined the same area and found that both fiscal and monetary policies affect the stock market. In our view, monetary policy refers to the control of the money supply by the central bank to ensure that the quantity and price of credit is consistent with specific national objectives.

In Ghana, Abaka (2009) also used the Johansen co-integration technique and Granger causality to examine the possible long-run and short-run effects between monetary policy and stock prices. The results suggest that there is a negative long-run relationship between interest rates and stock prices. In addition, an unexpectedly negative long-run relationship between money supply and stock prices is found. The results of the study further reveal an unexpected positive relationship between inflation and stock prices. The results of this study share the same expectation that there is a negative relationship between interest rate and stock market development. Earlier, Anokye and Tweneboah (2008) found the existence of a cointegrating relationship between macroeconomic variables and stock market index. Both studies showed that inflation is positively related to the stock market. This study took a different approach to see if the same conclusion could be drawn for the relationship between fiscal indicators and stock market performance. If the study finds the same result, it will argue that some of these earlier findings are still valid. Similarly, Echekoba, Okaro, Ananwude, and Akuesodo (2017) were Genuine empirical research has confirmed the fact that monetary policy variables affect stock market development. This finding occurred in the 1980s, coinciding with the development of statistical techniques such as co-integration and causality tests. Ho (1983) studied the impact of monetary policy on the stock markets of six countries -Australia, Hong Kong, Japan, the Philippines, Singapore and Thailand. He used monthly data on stock prices and measures of money supply M1 and M2. Co-integration and causality methods were used for the period 1975 to 1980. The study revealed a unidirectional causal relationship from money supply to stock prices in Japan and the Philippines respectively. A causal relationship also exists for money supply M2 in the stock markets of Hong Kong, Australia and Thailand. Singapore was found to be the only stock market country where a two-way relationship existed for both money supply M1 and M2. The Indian stock market reacts to unplanned and unexpected monetary policy announcements. ??huntingia and Khiremat (2019) assess the relationship between monetary policy announcements and stock returns in emerging markets. They focus on the expected component of planned announcements. They point out that in times of financial crisis and macroeconomic instability, central banks follow unplanned monetary policy announcements to stabilize markets. These unplanned monetary policy announcements forced market participants to change their behaviour, forcing most market participants to engage in jerk behaviour, which in turn have a considerable effect of unplanned monetary policy announcements on equity returns. They suggested that the monetary authorities should implement some additional policy initiatives on an ongoing basis to restore market efficiency.

motivated to look at the relationship between capital market performance and monetary policy. They used secondary data on all equity indices in the Nigerian capital market for the period 1986 to 2016 to conduct the test. They used the ordinary least squares (OLS) regression technique. The results of Ananwude and Akuesodo (2017) showed that the monetary policy rate has a negative and significant relationship with the stock market. This is consistent with the expectations of this study and, more importantly, supports the theoretical results. According to Yoshino, Taghiadeh-Hesary, Hassanzadeh, and Danu-Prasetyo (2014), the variables of monetary policy include the currency itself, the exchange rate, and inflation. They estimate the price response of Asian

229 stock markets to exogenous monetary policy shocks using a vector error correction model (VECM). The results  
230 show that the response of stock prices to an exogenous monetary policy easing is systematically increasing. The  
231 variance decomposition shows that 53% of TEPIX (Tehran Equity Exchange Price Index) stock prices are affected  
232 by an independent shock (US-Iran exchange rate).

233 In the sub-Saharan region, no research has been done on fiscal and monetary policy in the general market  
234 for financial assets in this region. Few studies have been done on economic development in this region. One  
235 such study was conducted by UbiAbi and Ekere (2018), who argue that governments should focus on designing  
236 and implementing programs to support product investment, trade, and an enabling environment. They reached  
237 this conclusion after examining the impact of fiscal and monetary policies on economic growth. A comparative  
238 analysis of the two policies showed that fiscal policy has a greater impact on economic growth than monetary  
239 policy. However, this study examines the same area in light of stock market developments and further reveals  
240 whether fiscal and monetary policies are moving in parallel.

241 Also, Perveen and Rahman (2018) examined the impact of fiscal and monetary policies on the stock market  
242 along with identifying the moderating role of political stability in Pakistan. The results indicate that there is a  
243 long-term relationship between fiscal and monetary policies and the stock market, while the short-term relationship  
244 exists only with respect to monetary policy measures and stock market functioning. They also showed that  
245 government spending, fiscal deficit, and money supply reflect a positive relationship with the stock market. On  
246 the other hand, tax revenue and interest rate showed a negative relationship with stock market performance.  
247 Moreover, political stability only moderates the relationship between interest rate and stock market performance,  
248 while the other relationships are not moderated by political stability. In the same country, an international study  
249 was conducted by Qureshi, Khan, Rehman, Qureshi, and Ghafoor (2019).

250 They examined effects of monetary and fiscal policies on bond mutual funds and the stock market. The  
251 results suggest an inverse bidirectional relationship between bonds and the stock market in the case of developed  
252 countries. Expansionary monetary policy is negatively related to bond mutual funds, while expansionary fiscal  
253 policy is positively related to bond mutual funds and the stock market. This shows that monetary policy signals  
254 an improvement in economic conditions. They argued that the interaction between fiscal and monetary policies  
255 is stronger in developed countries (Chatziantoniou, Duffy & Filis, 2013). The current study suggests reaching  
256 a similar conclusion only if a different estimation methodology is applied. International research supports the  
257 claim that fiscal policy, monetary policy, and stock market performance are all related (Chatziantoniou, Duffy  
258 & Filis, 2013). This part of the study shed light on the empirical studies that support this claim. It showed  
259 that the empirical results on attitudes are still inconclusive. There are few studies on the effects of fiscal policy,  
260 monetary policy, and the stock market. This study would serve as further research to provide these associations  
261 with more evidence.

## 262 5 IV. Methodology

263 This section discusses appropriate methods for addressing the research problem and achieves the objective of the  
264 study. The data collected at this stage were assigned to each respective specific hypothesis before the data been  
265 entered into the statistical package. E-Views software version 11.0 was used in analyzing the data collected. Data  
266 were summarized, analyzed, interpreted and presented to address the three research objectives of the study.

## 267 6 a) Dynamic OLS Estimation Approach

268 The present study started by estimating the dynamic ordinary least square (DOLS) regression to establish the  
269 type of connection among the variables of study. This study further contributed to empirical literature with use  
270 DOLS in regression estimation as against the use of OLS estimation technique.  $Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 Y_{t-2} + \alpha_3 Y_{t-3} + \alpha_4 Y_{t-4} + \epsilon_t$   
271  $Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 Y_{t-2} + \alpha_3 Y_{t-3} + \alpha_4 Y_{t-4} + \epsilon_t$   
272  $Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 Y_{t-2} + \alpha_3 Y_{t-3} + \alpha_4 Y_{t-4} + \epsilon_t$

273 Where;  $\ln(SDEV)$  it denotes natural logarithm of stock market development, and the independent variables were  
274  $\ln(GE)$ ,  $\ln(LGR)$ ,  $\ln(M2)$ ,  $\ln(LINT)$  denoted by natural logarithm of government expenditure, government revenue, money  
275 supply and interest rate respectively.  $\epsilon_t$  denotes error term. This study sourced data was the secondary data type.  
276 This type of data was appropriate and in line with the research design and method. Secondary data were chosen  
277 over primary data for four reasons. First, secondary data are easily available and accessible. Secondly, sources of  
278 secondary data such as International Monetary Fund (IMF) and Bank of Ghana (BoG) are more credible than  
279 primary data which may have been subjected to the researcher's bias. Thirdly, the study used secondary data  
280 because it is in line with research approach and most importantly prior empirical studies. Finally, it is difficult  
281 to construct primary data for some of the variables which were the subject of the investigation. Thus, it is  
282 appropriate to adopt secondary data for this research.

283 The data collected were annual series that spanned from 1991 to 2019. The key variables measured with this  
284 data were stock market development, government spending, government revenue or tax revenue, money supply,  
285 interest rate, inflation, monetary policy rate. The study treated stock market development as the dependent  
286 variable, while government spending, government revenue, money supply, inflation, monetary policy rate and  
287 interest rate were the exogenous variables. The endogenous variable which was stock market development was  
288 measured by stock market capitalization. Fiscal policy was measured by government expenditure and tax revenue

as adopted by Oresti and Napolitano (2016). Similarly, monetary policy was measured by interest rate and money supply (Haitsma, Unamis & De Haan, 2016). Summary of the variables, their proxies and sources are reported in Table 1.

## 7 i. Descriptive Analysis

The purpose of estimating descriptive analysis is to aid in understanding the features of the study data. This presentation is made possible by measuring the data and summarizing the data. This measure is divided into two parts: a measure of central tendency and a measure of variability (spread of the data). Measures of central tendency include the mean when the data exhibit ratio or range characteristics and the median when the data can only be grouped and ranked. In addition, measures of variability include standard deviation, minimum and maximum variables, and tests for skewness, the Jarque-Bera statistic and kurtosis.

The first preliminary test conducted was the normality of the variables under study. The reason for this test is to investigate mean error term. And see if the result would be zero. Then the variables were normally distributed. This test was conducted because nonnormality of the variable could lead to non-normality of the residuals which is a problem. Thus, to avoid this pitfall, normality test was conducted. In order for a variable to be normally distributed, its skewness must be close to zero, its kurtosis must be equal to three, and the Jarque-Bera statistics must be non-significant. From Table 2, skewness was less than one and closer to zero, signifying a normal distribution. None of kurtosis was equal to zero or close to three. Thus, based on the Jarque-Bera statistics, the data turned out to be not normally distributed and insignificant.

The measure of variability was determined by estimating the mean values of all variables considered for the purpose of this study. Source: Field Data (2020)

ii. Unit-Root Testing Unit root analysis is one of the methods used to establish the stability of data, assuming that the time series is stable (Dasgupta, 2012). It assumes that the time series is stationary (Dasgupta, 2012). In this study, both Augmented Dickey Fuller (ADF) test and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test were applied. ADF test is used to determine the presence of unit root in time series data. The null hypothesis states that there is a unit root in the series and the alternative hypothesis states that there is no unit root in the series. If the null hypothesis is not rejected, this test is evidence that the series is non-stationary. Augmented Dickey Fuller (ADF) unit root handles the correlation error of the test model by including sufficient regressive lags. On the other hand, the KPSS test is used to test the stationarity of the time series; the null hypothesis of KPSS indicates that the process is trend stationary. The null hypothesis of KPSS indicates that the process is trend stationary, while the alternative hypothesis indicates that the process is not trend stationary. In order to ensure that the series is truly stationary, it is desirable to apply both tests. In this case, non-stationary differences in the time series description can be used to correct the problem.

The results in Table 4 confirm the study's expectation of estimating time series data I (1) that are stationary and integrated to one. Therefore, we reject the null hypothesis and accept the alternative hypothesis that there is no unit root. Therefore, LGEXP, LGR, LINF, LINT, LM2, LMPR, and LSDEV are stationary at 1% in both ADF and KPSS unit root tests. C V.

## 8 Correlation Analysis

Correlation analysis is the technique used in this study to justify whether or not the study variables have multicollinearity problems. For a study variable to be highly correlated, the coefficient should not exceed 0.9. The results of the correlation coefficients for this study are presented in Table 3. The regressors, monetary policy rate and government revenue, showed a strong positive relationship with inflation and government spending. The reason being that government revenue was directly spent by the government at the consumption stage.

Interest rate and money supply variables form the basis for setting the monetary policy rates by the Apex bank. The monetary policy rate exhibits a strong direct relationship with interest rates. The interest rate This study uses this estimation technique to address the proposed research question. The dynamic OLS technique is suitable for revealing the nature of the relationship. Thereby, dynamic OLS explained the extent to which policies affect the development of the exchange market. DOLS involves augmenting regression with leads and lags so that the resulting residual equations are orthogonal to the overall estimated model (Mehonood, Feliceo & Shahid, 2014). When estimating DOLS, certain assumptions need to be established, essentially, making it a better choice than OLS. Firstly, dynamic ordinary least squares improve OLS by coping with small samples and bias from dynamic sources. Secondly, misspecification of one equation does not affect the other. Thirdly, the variables in the study are integrated to first order (Al-Azzam & Hawdon, 1999). The DOLS regressions to be estimated must satisfy the Gauss-Markov conditions. The first condition is that the residual value should be anticipated value of zero. This means that the positive residual values cross out the negative residual values. The mean of the residual value then becomes zero. Secondly, there is no autocorrelation between the residuals so that some of the properties of dynamic ordinary least squares are not violated. In addition, the error terms or residual value have equal variances. Finally, regression specification model is correct, with no missing or incorrect functional forms (Gujarati, 1998) Table ?? reports statistics from the dynamic regression analysis. The reported R<sup>2</sup> provides estimates of the degree of impact or change in stock market development attributable to changes in government spending, government revenue, money supply and interest rates as explanatory variables and two

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349 control variables: inflation and monetary policy rate. The model estimates from Table ?? reveal an R<sup>2</sup> of 0.6064  
350 and an adjusted R<sup>2</sup> of 0.5741. Again, the R<sup>2</sup> statistic indicates a positive relationship between endogenous  
351 and exogenous variables. In this case, the endogenous variable is stock market development and the exogenous  
352 variables are government spending, money supply, government revenue and interest rate. The policy rate and  
353 inflation rate are good indicators of monetary policy and are included in the exogenous variables. Thus, R<sup>2</sup>  
354 explains 60.64% of the variation in stock market development that is caused by these independent variables.  
355 In addition, these independent variables as well as the control variables explain 57.42% of the total variation  
356 in stock market development. This finding is supported by reported adjusted R<sup>2</sup> of 57.42% in the estimated  
357 models. When estimating such models, researchers are often confronted with the problem of autocorrelation and  
358 usually use the Durbin-Watson test statistic as a basis for demonstrating the presence of autocorrelation. In  
359 contrast, the DOLS estimation technique is a superior approach when estimating regressions because it solves  
360 the autocorrelation problem by selecting lags and leading lines. With this in mind, Table ?? reports that the  
361 dynamic ordinary least squares (DOLS) estimation technique omits the Durbin-Watson statistic and provides  
362 the assumption that there is no autocorrelation in the regression. DOLS is also a non-stationary estimation  
363 technique. In addition, the study used the standard error of regression (S.E.R.) to determine the mean distance  
364 of the observations from the regression line. The rule of thumb is that the smaller the S.E.R. value, the better  
365 the model is estimated. This indicates that the observations are closer to the regression line. The S.E.R. reported  
366 from Table 6 is 0.03609, which indicates that the fitted mean stronghold is approximately 0.03% body fat. The  
367 revealed S.E.R. value is very small, less than 1%. The study concluded that the regression model was relatively  
368 close to the regression line.

369 A previous discussion cites government expenditure and government revenue as proxies for measuring fiscal  
370 policy. The results for these two variables are therefore fundamental proof of the kind of the association between  
371 stock market development and fiscal policy. First, Table ?? reports government expenditure and shows a positive  
372 coefficient of 0.1015 with a probability value of 0.2984, which is not significant at the 10% level. Therefore, the  
373 null hypothesis which states that there is no significant relationship between government expenditure and stock  
374 market development is accepted. Technically speaking, there is no relationship between government expenditure  
375 and stock market development. This implies that a rise in government expenditure does not lead to a change  
376 in stock market development. Similarly, government revenue reports a positive coefficient of 0.1183 with a  
377 probability value of 0.2897. The probability value for government revenue is also insignificant at 10%. Therefore,  
378 there is no relationship between government revenue and stock market development. This implies that an increase  
379 in government revenue does not have an impact on the development of the stock market.

380 These results are inconsistent with research expectations. Based on the literature review, the study expected  
381 fiscal policy to have a significant positive impact on stock market development. Apparently, the results found  
382 by applying government expenditure and revenue as proxies for fiscal policy showed an insignificant positive  
383 relationship with stock market development. In particular, the study is inconsistent with the theory of market  
384 efficiency. The theory of market efficiency implies relevant information, which includes data on individuals,  
385 firms, investors and governments ??Fama, 1970). When markets are efficient, then all the information has been  
386 incorporated into the stock price. Therefore, all this information influences the development of the market and  
387 makes it efficient. As an example, the development of the market is influenced by fiscal policy.

388 Similarly, inflation is a control variable for the application of fiscal policy. Table ?? reports a coefficient of  
389 0.0353 with a p-value of 0.0615 at the 10% level of significance. In other words, a 1% change in stock market  
390 development leads to a 3.53% change in the inflation rate. Inflation rate has a positive and significant effect on  
391 stock market development, while government expenditure and revenue do not provide any significance or support  
392 any theoretical hypothesis. Although, the underlying theories such as Keynesian theory and market efficiency  
393 theory support that the implementation of fiscal policy helps to boost aggregate demand and employment.  
394 Therefore, when aggregate demand increases; employment increases and in turn stock market capitalization  
395 increases. Economic growth in Ghana is very low because the highest bank of authority has adopted a single-  
396 digit inflation strategy to stabilize the inflation and maintain good currency depreciation. However this study  
397 shows that when inflation is allowed to increase, it will lead to an increase in the development of the stock market  
398 in this country as well as the overall economic growth. The Bank of Ghana should therefore look at the drawbacks  
399 of this inflation In all sectors of the economy, capital is important to sustain and avoid economic collapse. With  
400 this in mind, this study shows that funds are not flowing to the sectors of the economy that would have boosted  
401 aggregate demand. The agricultural sector is the one sector of the economy that would have improved, as growth  
402 in GDP leads to growth in the overall economy, which includes all private and public consumption, government  
403 spending, investment and external balance of payments trade. Thus, most of government expenditure and revenue  
404 generation could have been concentrated in this sector. Furthermore, Ghana does not generate enough revenue  
405 from taxes and international grants to support the economy and lead to further development of the stock market.  
406 Nevertheless, this study affirms the findings of inflation and concludes that fiscal policy is positively associated  
407 with stock market development.

408 From a recent study by Idowu, Bamidele and Elumah, (2020), there is empirical consistency from the  
409 perspective of fiscal policy and stock market. Idowu, Bamidele and Elumah, (2020) found that when they  
410 used an unrestricted vector autoregressive model, there was a positive significant relationship. The same results  
411 were obtained in this study when dynamic ordinary least squares were used. Similarly, Foresti and Napolitano

## 9 B) OBJECTIVE TWO: EFFECTS OF MONETARY POLICY ON STOCK MARKET DEVELOPMENT

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412 (2017) establish evidence of a negative correlation between fiscal policy and the stock market. This is in contrast  
413 to the results of this study. Truly, the study variables on fiscal policy exhibited a direct influence on the stock  
414 market development. Irrespective of the fact that fiscal income and deficit testified an insignificant coefficient;  
415 the coefficients implied a direct relationship. Previous studies by Amo-Yartey (2014), Havi and Enu (2014) and  
416 Afonso and Sousa (2009) affirm the position that fiscal policy, when properly applied, has a positive impact on  
417 the exchange market and the economy. Interestingly, Asamoah, (2017) explains that fiscal deficit as a sizable and  
418 powerful effect induced by fiscal spending leads to revenue shortfall. The current study supports this assertion  
419 that government expenditure is greater than revenue leading to fiscal deficit. This is evident from the comparative  
420 percentages of their coefficients of fiscal expenditure and fiscal revenue of 11% and 10% respectively.

421 The implication of the findings of this study is that government revenue comes from taxation and unsecured  
422 international grants. So basically, it is taxes and loans or debt. This directs attention to how the government  
423 finances its debt. If government spending is financed through higher taxes, then the increase in taxes may offset  
424 the increase in spending and aggregate demand will not increase and there will be no impact on stock market  
425 development. Ghana's debt ratio suggests that our government spending is not entirely financed by taxes. The  
426 results of this study show that the government revenue rate is lower than the government expenditure rate.  
427 Therefore, higher spending can lead to crowding out. Crowding out is when government spending is higher but  
428 has the effect of reducing private sector spending. For example, if the government borrows or sells treasury bills  
429 to individuals, individuals will have less investment savings.

430 A further implication of this finding found government spending coefficient to be insignificant. Although, in  
431 free market economy, spending should be significant enough to have an effect on the market or the economy. If  
432 this is not the case, it leads to inefficient government spending. This, in turn, is caused by poor information  
433 systems and lack of incentives, which leads to misallocation of resources and lower economic growth, which in  
434 turn leads to low stock market performance.

### 435 9 b) Objective Two: Effects of Monetary Policy on Stock 436 Market Development

437 The results of interest rate analysis have affirmed the theoretical views of some academics. The discounted  
438 dividend theory, for example, argues that the performance of the stock market is seen as the discounted value of  
439 future dividends. In turn, an appreciation in price causes an increase in the risk-free rate, leading to a decrease  
440 in the value of the stock price. Miller and Modigliani (1961) argue that the interest rate is one of the key  
441 determinants of stock prices, to the extent that the efficiency of the market depends on it. This suggests that  
442 an increase in the level of interest rates reduces the level of stock market development. Again, the results of this  
443 study do support this view as it reveals a negative and significant coefficient for the interest rate, which is the  
444 main proxy for measuring monetary policy.

445 In line with empirical contribution, the findings of this study under the second specific objective are consistent  
446 with some previous studies. Wong, Khan and Du, (2005) find that the stock market in Singapore moves in  
447 tandem with interest rates. They used multiple regression methods and Granger causality. The study concluded  
448 that the coefficient on interest rates was inversely related to stock market development. The difference lies in the  
449 methodology used. This study uses dynamic regression analysis and the Toda-Yamamoto method.

450 The specific objective stated in Chapter one is to attempt to determine the relationship between monetary  
451 policy and stock market development in Ghana. In testing the existence of this relationship, a null hypothesis was  
452 formulated in order to achieve this objective. The coefficients of the monetary policy On the other hand, there  
453 is a positive and significant relationship between monetary policy interest rate and stock market development.  
454 Table ?? shows that the t-statistic is 4.738 with a coefficient of 0.2377 and a p-value of 0.000 at the 1% level of  
455 significance. The positive relationship implies that when the stock market level increases by 1%, the monetary  
456 policy rate will increase by 23.77%. This result for the monetary policy rate does support the theoretical  
457 hypothesis. The expectation of the study is that there is an inverse relationship between the two variables. In  
458 fact, the Bank of Ghana uses the monetary policy rate to control inflation, unemployment and economic growth.  
459 The result of this study implies that when the Bank of Ghana increases the policy interest rate, it induces an  
460 increase in stock market development as well. In order for the stock market to develop, the Bank of Ghana should  
461 increase the policy interest rate. This restrictive policy action may not be welcomed by commercial banks and  
462 other financial institutions because it becomes expensive to borrow more money. This approach is used in the  
463 context of strong economic growth and possible high inflation. There is also a tendency for investors to shift their  
464 investments from treasury bills to the stock market due to higher policy rates, which in turn would increase the  
465 cost of borrowing from these financial institutions, thus reducing their return on investment. At the same time,  
466 the price of the stock market will increase, thus attracting investors to the market. With the Bank of Ghana  
467 reducing its policy interest rate, commercial banks and other financial institutions will turn to borrow more  
468 money because of the low cost of borrowings. This action results in a reduction in stock market development as  
469 well. Obviously, some listed companies will shift their investments from the stock market to other investment  
470 vehicles due to the decline in stock prices. For most listed companies, it is difficult to raise investment capital.  
471 This is because as share prices fall, it becomes more difficult to raise equity capital by issuing shares, which  
472 also reduces investment. In terms of confidence factors, falling share prices can erode consumer and business



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473 confidence. A continuation of this situation would indicate impending economic turmoil, and expansionary action  
474 should be taken to correct the situation.

475 Another relevant finding is the study by Eckoba, Okaro, Ananwude and Akuesodo (2017) which investigates the  
476 actual impact of monetary policy on stock market. The results showed that monetary policy rate has an inverse  
477 and significant effect with stock market. This result is not in line that of monetary policy rate, in this study.  
478 This is because it reveals a positively significant relationship rather than a negatively significant relationship.  
479 Therefore, it is consistent with the results of this study especially for the money supply and rate of interest.

480 On the contrary, Havi and Enu (2014) studied the importance of monetary policy on the economy. They  
481 reveal that monetary policy is positively related to economic growth. The similarity of this study is that the  
482 methodology applied is closely related to that of the present study. The OLS estimation method was not applied  
483 in this study because of its associated bias. The main difference is in the dependent variable used. As this study  
484 may use stock market development this related literature uses economic growth variables.

485 Still on the conclusion that is inconsistent with the results of this study, Ubi-Abi and Ekere (2018) reached this  
486 conclusion in their investigation of the impact of monetary policy on economic growth. They applied GMM and  
487 Dumitrescu-Hurlin causality. They explain that economic policy affects the stock market to a large extent through  
488 economic growth. Their results show that monetary policy is positively related to economic growth, which in turn  
489 affects the stock market. The differences in the results may be attributed to the methodology applied and to the  
490 differences as proxy variables. Similarly, Iddrisu, Harvey and Amidu (2017) had the same inconsistent results.  
491 They establish that stock markets in 12 African countries are positively influenced by monetary policy through  
492 the interest rate channel. In contrast to this study, the findings of Iddrisu, It is evident from the dynamic ordinary  
493 least squares regression estimates that money supply and interest rate are the main measures of monetary policy,  
494 while the monetary policy interest rate is included as a control variable for measuring monetary policy. Interest  
495 rate shows a negative and significant relationship with stock market development in Ghana. The significance  
496 level of interest rate indicates that monetary policy has a significant effect on stock market development. The  
497 results show that the coefficient of interest rate is -0.1433 with a significance level of 1%. The negative coefficient  
498 indicates a negative connection between interest rates and stock market development. In addition, it shows that  
499 a 1% change in the development of stocks leads to a 14.33% decrease in the level of interest rates, all other  
500 things being equal. Applicabilitywise, this indicates that when the level of monetary policy deepens, the level  
501 of stock market development decreases. Similarly, the negative coefficient of money supply is -0.1369 with a  
502 p-value of 0.1822, which is not significant. This implies that there is no relationship between money supply and  
503 stock market development. Although, coefficient is depicting an inverse relationship; the results were in line with  
504 expectations of the study for interest rates. Therefore, money in circulation or money supply does not have any  
505 significant influence on the stock market.

506 Harvey and Amidu (2017) are derived from 12 different African countries and in each country; they differ in  
507 interest rates, policy rates, exchange rates and other macroeconomic variables. Given this, their results should  
508 reflect these differences, but their report shows a different picture.

509 The empirical implications of the results of this study will help to understand the implications of some of  
510 these findings. Initially, the flow of money plays a crucial role because it predicts movements in prices, output  
511 and employment. The role of the central bank is to provide money for commercial banking and other service  
512 transactions, avoiding the need for a barter system. When the money supply is negative, it affects the profitability  
513 of any economy. Individuals, households and investors will find it difficult to obtain external financing. This  
514 will cause them to cut back on spending. In addition, a negative money supply coefficient indicates the need for  
515 measures to create a stronger market. This is because the underlying causes may be intrinsic. These intrinsic  
516 causes include increased spending on input costs, natural disasters, wars, increased taxes, and low labor wages.

## 517 10 VII. Conclusion and Implication

518 In addressing the salient hypotheses, the following conclusions are drawn. The study identifies a direct connection  
519 between stock market development and fiscal policy. It shows that fiscal policy is implemented to boost aggregate  
520 demand, which in turn boosts the stock market. The study showed that when inflation is allowed to increase,  
521 it will lead to an increase in stock market development as well as the overall economic growth of the country.  
522 Therefore, the Bank of Ghana should look at the drawbacks of this single-digit inflation targeting technique and  
523 implement policies that will boost the economy and the stock market by causing periodic price increases. This  
524 study supports the notion that government expenditure is greater than revenue, which leads to fiscal deficit.  
525 This is evident from its coefficient comparison percentages of 11% and 10% for fiscal expenditures and revenues,  
526 respectively. The study concludes that the government's revenues are mainly derived from taxes and unsecured  
527 international grants, and once the revenues collected do not match the projected budget, the functioning of  
528 the entire economy becomes problematic and affects stock market investments. Interestingly, there are some  
529 inconsistencies with research expectations. The following variables provide some unexpected insights. They are  
530 government spending, government revenue and money supply. Although, these variables do establish that they  
531 have an impact on stock market development. These variables provide insignificant results. This could be due  
532 to the inefficiency of the market.

533 In addition, monetary policy shows a negative relationship with stock market development when interest rates  
534 are used as a proxy for monetary policy. This suggests that when the level of monetary policy deepens, the

## 12 VIII. RECOMMENDATIONS

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535 level of stock market development decreases. Therefore, any change in interest rates can cause difficulties for  
536 investors and affect the profitability of listed companies, which can lead to stock price volatility. On the other  
537 hand, the study also applies the monetary policy interest rate as an alternative measure of monetary policy. The  
538 study established a positive association between monetary policy and stock market development. This led to  
539 the conclusion that whenever the Bank of Ghana increases the policy interest rate, it turns to increase the stock  
540 market development. This restrictive approach is used by the Bank of Ghana, which is used in a strong economy  
541 and not in a depressed economy. In addition, there is a strong tendency for listed companies to shift their  
542 investments from treasury bills to the stock market due to the increase in the policy interest rate, which in turn  
543 increases the borrowing costs of these financial institutions, thus reducing their investment returns. At the same  
544 time, the price of the stock market will rise, thus attracting investors to the market. Nonetheless, in the event  
545 that the Bank of Ghana reduces the policy rate, commercial banks and other financial institutions will turn to  
546 increase their borrowing because of the low interest rates. This leads to a reduction in stock market development  
547 as well. This means less investment wealth, difficulty in raising equity capital and weakened consumer and  
548 business confidence.

549 Furthermore, the first double causality between interest rates and the monetary policy rate implies that because  
550 commercial banks' interest rates depend on the interest rate at which the central bank is willing to lend them  
551 money. This explains the causal relationship between the flow of monetary policy to the interest rate. On the other  
552 hand, the central bank sets the lower and upper limits of the policy rate, and commercial banks can vary within  
553 the lower and upper limits. These changes in interest rates for commercial banks and financial services explain  
554 the causal effect of interest rate flows to the monetary policy rate. In addition, the second bi-causal relationship  
555 between inflation and government revenue implies that inflation affects government revenue, especially when  
556 inflation is unanticipated. Unanticipated inflation benefits the government because the government is a larger  
557 debtor and gains from taxes as nominal revenues increase. The findings on the unidirectional causality from  
558 inflation to interest rates provide evidence to as to role that nominal and real interest rates play in the financial  
559 system. This provides evidence to support the understanding that nominal interest rates move in tandem with  
560 expected inflation rates in the case of time series data.

### 561 11 C

562 Finally, a second uni-directional relationship from inflation to stock market development provides evidence that  
563 firms interested in income-producing stocks are less attractive in the face of high inflation than in periods of low  
564 inflation. Inferentially, a third uni-causal relationship from stock market development to interest rates provides  
565 evidence for the dividend discounting model, demonstrating that the discount rate is negatively related to stock  
566 returns.

## 567 12 VIII. Recommendations

568 Although the outcomes of fiscal and monetary policies have proved to be asymmetric in most countries, it should  
569 be noted that monetary and fiscal policies are interdependent. Therefore, a consistent and sustainable policy  
570 mix framework is needed to avoid possible inconsistencies. From a policy perspective, the findings suggest the  
571 need to adopt a single model. This single model would comprise of fiscal policies and monetary policies together.  
572 This is because the interactions between these policies have a significant impact on the development of the stock  
573 market. The two policies should therefore be considered in tandem, rather than in isolation.

574 The study recommends a moderate inflation rate rather than a single-digit inflation rate. The reason for this  
575 is that moderate inflation drives stock market expansion as well as stock prices. The study encourages the Bank  
576 of Ghana to apply a moderate inflation to help the exchange market. Moderate inflation will force the Central  
577 Bank to expand its purchases of government bonds and other assets. This is done by increasing the money in  
578 circulation. This action raises consumers and businesses expectations, thereby encouraging them to spend more  
579 than they save. This moderate inflation is therefore more appropriate than maintaining a low inflation rate First  
580 of all, when general prices barely move, many consumers and businesses would postpone purchases because prices  
581 is seemingly different or barely changes to the extent that it would affect their forecasted budgets. Secondly, when  
582 there is low inflation salaries and wages do not increase. By so doing, there is no reason for labour union and  
583 other stakeholders to argue for increase in remuneration. This is not the case when moderate inflation is adopted.  
584 Moderate inflation provides reason for increase in wages and salaries which in turn would cause an increase stock  
585 market development. Thirdly, with low inflation or single-digit inflation, debt burdens are magnified. In the  
586 case, where income is stable overtime, paying interest on loans becomes a heavy financial burden. This has been  
587 one of the reasons for Ghana experiencing heavy burden with interest loans. Thus, if Bank of Ghana follows this  
588 recommendation and adopts moderate inflation, the country would reap benefits such as reduction in real value  
589 of debt; allowing prices to adjust and attain real price; allowing relative wage adjustment and finally causing  
590 increase in the stock market development.

591 Furthermore, this study recommends that Ministry of Finance in collaboration with the parliamentary budget  
592 committee provide stringent fiscal rules. This system would guide the fiscal management above and beyond  
593 regular annual budgeting. This system also aims at providing clear performance indicators on government debt,  
594 borrowings, deficit and expenditure. They have to pay attention to the country's debt rules. By establishing an

595 explicit maximum debt level of which they do not go beyond and for expenditure rules certain specific sub-sets  
 596 of expenses that are in absolute terms should be limited to specified percentage limits.

597 It is deemed important for the government to resource Ghana Revenue Authority with adequate training and  
 598 development in the areas of expanding tax brackets, revenue collection and accurate data on taxpayers. This  
 599 would help improve the revenue and expenditure differences. That is having the revenue being higher than the  
 600 expenditure. Also, the country should focus other sectors such as agriculture and manufacturing in the economy  
 601 that would bring income into the country. This would help to avoid the problem of Dutch disease.

602 Finally, the study recommends that bond analyst and policy makers to assign the due attention to monetary  
 603 policy rates and interest rates. This is because these variables prove to be highly related and that anytime,  
 604 policy rate changes, interest rate also changes and the other way round. Therefore, these two variables cannot be  
 605 disentangled when they are doing their analysis. This proves the point that when bond analyst considers these  
 policies together the decisions they make would depict exactly the market trend. <sup>1</sup>

**1**

Variables		Proxies/Measurement	Sources of Data
Stock Market Development		Market Capitalization	Ghana Stock Exchange
Fiscal policy	Government Expenditure	Natural log of Government spending	Bank of Ghana
	Government revenue	Natural log of Government tax revenue	Bank of Ghana
	Inflation	Annual Inflation rate	International Monetary Fund
Monetary policy	Interest rate	Natural log of 3-month Treasury Bills	Bank of Ghana
	Money supply	Natural log of Broad Money supply (M2)	Bank of Ghana
	Monetary policy rate	Annual Monetary policy rate	Bank of Ghana

Source: Field Data (2020)  
 c) Diagnostic Tests

Figure 1: Table 1 :

**2**

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Figure 2: Table 2 :

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Variables	ADF		KPSS		Order
	T-Statistics	P-Value	T-Statistics	P-Value	
LGEXP	-3.09	0.03	3.38	0.00	I (1)
LGR	-2.66	0.08	3.64	0.00	I (1)
LINF	-5.24	0.00	97.29	0.00	I (1)
LINT	-5.72	0.00	108.37	0.00	I (1)
LM2	-12.54	0.00	9.01	0.00	I (1)
LMPR	-4.51	0.00	179.77	0.00	I (1)
LSDEV	-13.57	0.00	579.32	0.00	I (1)

Source: Field Data (2020)

Figure 3: Table 3 :

4

	LGEXP	LGR	LINF	LINT	LM2	LMPR
LGEXP	1					
LGR	0.53	1				
LINF	0.13	0.26	1			
LINT	0.07	0.15	-0.09	1		
LM2	0.13	0.14	-0.24	-0.34	1	
LMPR	0.36	0.36	0.05	0.69	0.03	1

Source: Field Data (2020)

VI. Analysis using Dynamic Ordinary Least Square (DOLS) Regression

Figure 4: Table 4 :

5

Variable	Dynamic Regression Estimation			
	Coefficient	Std. Error	t-Statistic	Prob.
LGEXP	0.101476	0.097275	1.043192	0.2984
C	4.324764	0.223050	19.38921	0.0000
LINT	-0.143339	0.027592	-5.194875	0.0000***
LINF	0.035262	0.018726	1.883090	0.0615*
LGR	0.118254	0.111312	1.062368	0.2897
LM2	-0.136888	0.102170	-1.339803	0.1822
LMPR	0.237783	0.050185	4.738129	0.0000***

: R<sup>2</sup> 0.606, Adjusted R<sup>2</sup> 0.574176, Mean dependent var of 4.996, S.D. dependent var of 0.055308, S.E. of regression 0.036, Sum squared resid of 0.207, Long-run variance of 0.0014. \*, \*\*and \*\*\* denote 10%, 5% and 1% significance level. Source: Field Data (2020).

Figure 5: Table 5 :

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## 12 VIII. RECOMMENDATIONS

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