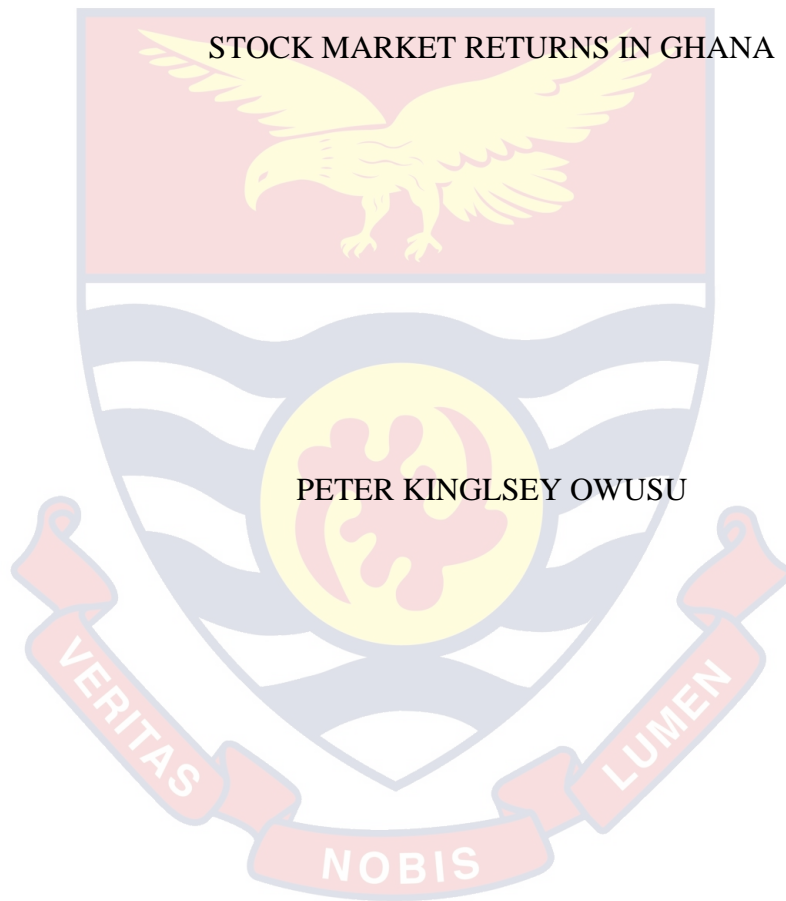UNIVERSITY OF CAPE COAST

MACROECONOMIC VARIABLES, CONTROL OF CORRUPTION AND

STOCK MARKET RETURNS IN GHANA

PETER KINGLSEY OWUSU

2021

UNIVERSITY OF CAPE COAST

MACROECONOMIC VARIABLES, CONTROL OF CORRUPTION AND

STOCK MARKET RETURNS IN GHANA

BY

PETER KINGLSEY OWUSU

Dissertation submitted to the Department of Finance of the School of Business,

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Award of Master of Business Administration Degree in Finance

AUGUST 2021

DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature ………………………… Date ……………………..

Name: Peter Kinsley Owusu

Supervisor's Declaration

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the University of Cape Coast.

Supervisor's Signature ………………………… Date ……………………….

Name: Patrick Kwashie Akorsu

ABSTRACT

The study assessed the relationship among macroeconomic variables, control of corruption and stock market returns in Ghana. The specific objectives were to first analyse the relationship between macroeconomic variables and stock market return and also to examine whether control of corruption influences such relationship. Data on stock market returns, inflation, money supply and GDP were sourced from the International Monetary Fund Website, Ghana Stock Exchange and World Bank and Worldwide governance indicators for the period 1996 to 2018. Quantitative research method was employed as the approach and the explanatory research design was used. The data collected were analyzed using autoregressive distributed lag (ARDL) model and the bound's test. The overall conclusion deduced from this study is that there is a long run and short run relationship among macroeconomic variables and stock market return in Ghana. In the short run, the study concludes that money supply has a significant positive influence on stock market return while inflation negatively influences stock market return. In the long run, the study concludes that inflation has a negative effect on stock market returns while GDP and money supply had a significant negative effect on stock market returns. Finally, corruption enhances the positive effect of all the macroeconomic variables on stock market returns. The study recommends that both current and potential investors should pay close attention to the inflation, money supply, GDP and corruption dynamics before making investment on the Ghanaian Stock exchange.

KEY WORDS

Inflation

Money Supply

Stock market returns

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DEDICATION

To my Wife, Parents, Siblings, and Friends

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LIST OF ACRONYMS

CRP   Control of Corruption

GDP   Log of Gross Domestic Product

INF   Inflation

LMS   Log of Money Supply

SMR   Stock Market Return

CHAPTER ONE

INTRODUCTION

Given the importance of the Ghana stock exchange to economic growth in Ghana, some extant literature has established relationships between macroeconomic variables and stock market movement in Ghana. However, these empirical studies have largely proven to be inconclusive. The difference in findings could be as a result that there is limited empirical literature on the conditions under which macroeconomic variables will enhance stock market returns. Thus, this study explains control of corruption as one of the factors that could enhance the relationship between macroeconomic variables and stock returns in Ghana.

Background to the Study

The stock market of an economy is a vital area in the finance sector that requires attention and careful study. Stock market is a market that mediates the transaction between buyers and sellers of stocks. A well-functioning stock market is said to assist the development process of an economy, most especially by boosting savings and allowing efficient resource allocation (Alshogeathri, 2011). As part of its importance to an economy, a well-functioning stock market values the profitability of a company's shares and through this activity, the status of a company can be determined as performing and also be compared with other companies (Alshogeathri, 2011).

Alshogeathri (2011) posited that volatility in the stock market characterizes the behaviour of the market. That is, the relative rate at which there

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is an upward (increase) or downward (decrease) movement in the prices of stocks within the shortest period of time determines the status of the market. Frequent movement in the market will obviously avert the smooth performance of financial markets and the economy as a whole.

Stock market returns is explained as income generated from stock market (Baffour, 2016). This is very relevant to the economy of Ghana because most studies have stressed on a positive influence of stock market returns on the economic growth in Ghana (Owusu & Odhiambo, 2014; Asante, Agyapong, & Adam, 2011). Thus, most researchers have paid much attention to factors that influence stock market returns (Winful, Sarpong & Agyei- Ntiamoah, 2016; Issahaku, Ustarz & Domanban, 2013). Most of these studies have been on the relationship between macroeconomic variables (which includes: gross domestic product, inflation, interest rate and money supply) and stock market (Prempeh, 2016; Baffour, 2016; Kpanie & Esumanba, 2014; Mireku, Sarkodie, & Poku, 2013; Adam & Tweneboah, 2008).

While the performance of stock market is of interest to investors, financial analyst and management of businesses, the attention of researchers is not only focused on the performance of the market but also, how macroeconomic variables determine the performance of the market. Literature on the relationship between macroeconomic variables and stock market movement has presented inconclusive findings (Winful, Sarpong & Agyei- Ntiamoah, 2016; Issahaku, Ustarz & Domanban, 2013; Prempeh, 2016; Baffour,2016; Kpanie & Esumanba, 2014; Mireku, Sarkodie, & Poku, 2013; Adam & Tweneboah, 2008). While some of

these studies indicate that there is a significant and positive relationship, (Domanban, 2013; Prempeh, 2016; Baffour,2016) others also suggest no significant impact (Winful, Sarpong & Agyei- Ntiamoah, 2016; Issahaku, Ustarz & Domanban, 2013). However, few studies have reported that the relationship between these variables will be significant when enhanced with another variable. Macroeconomic variables such as interest rate, inflation rate, and exchange rate among others have been found significant to determine stock market movement.

Ming, Jais, Rahim and Che-Ahmed (2018) argued that economic factors are not the sole variables that affect movement in the stock market, and that their impact are being influenced by secondary factors being it political and/or psychological. Ming et al. (2018) added that macroeconomic and institutional factors are the two major factors that influence stock market development and volatility. Institutional factors are best understood as human constraints that structure political, social and economic interactions. These factors are aimed at ensuring orderliness and mitigating uncertainties associated with business transactions in an economy.

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In recent times, some empirical studies have shown that there is a high level of corruption perception in Ghana (Drama, 2020; Damoah, Akwei, Amoako & Botchie, 2018). According to Hussain, Sabir and Meo (2017), corruption continues to exist in developing countries due to weak governance structures, and this is likely to affect stock market activities. Therefore, studies conducted on the relationship between corruption and stock market return in Ghana have largely shown a positive relationship between control of corruption and stock market returns in Ghana, which implies a negative relationship between corruption and stock market returns (Winful, Sarpong & Agyei-Ntiamoah, 2016). While there are many macroeconomic factors that affect stock market returns, the new institutional theory posits that institutional arrangement such as corruption influence the effectiveness of macroeconomic policies.

Given this, there is value in conducting a study that examines how macroeconomic interacts with corruption perception to influence stock market returns. In this regard, this study is purposed to investigate the role that corruption factors play on the macroeconomic-stock market nexus. Ghana is of a particular interest to conduct this study due to a number of reasons. First, according to several empirical studies, developing countries such as Ghana are bedeviled with corruption (Agbloyor, Gyeke-Dako, Kuipo, & Abor, 2016), and thus corruption

may undermine the effectiveness of stock market transactions. Also, literature on macroeconomic variables and stock returns have ignored how corruption may affect such relationship (Winful, Sarpong & Agyei-Ntiamoah, 2016; Issahaku, Ustarz & Domanban, 2013; Prempeh, 2016; Baffour,2016; Kpanie & Esumanba, 2014; Mireku, Sarkodie, & Poku, 2013; Adam & Tweneboah, 2008) .

Statement of the Problem

Given the relevance of stock markets to economic growth in Ghana, extant literature has established relationships between macroeconomic variables and stock market movement in Ghana (Prempeh, 2016; Baffour, 2016; Kpanie & Esumanba, 2014; Mireku, Sarkodie, & Poku, 2013; Adam & Tweneboah, 2008). However, the empirical findings have largely proven to be inconclusive. The difference in findings could be as a result that there is limited empirical evidence on the conditions under which macroeconomic variables will enhance stock market returns.

Corruption continues to be major issue in many developing countries and feeds into the development of their financial markets (Baek, 2016). In Ghana, Winful et al. (2016) provided evidence that there is a negative relationship between level of corruption and stock market returns, due to the high level of corruption in Ghana. Given that the effectiveness of macroeconomic variables depends on institutional structures such as the control of corruption (Welsch & Kuhling , 2016), it will be worthwhile examining how corruption affects the relationship between macroeconomic variables and stock market returns. Thus, this study, differs from extant studies that have examined the relationship between

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macroeconomic variables and stock market return in isolation, to examine the role that corruption plays in such a relationship.

Purpose of the study

The main objective of the study is to examine the relationship between macroeconomic variables, corruption and stock market movement in Ghana.

Research Objectives

Specifically, the study seeks to:

1. Examine the relationship between macroeconomic variables and stock market movements in Ghana.

2. Analyse the moderating role of corruption on the relationship between macroeconomic variables and stock market movements in Ghana.

Hypotheses

1. H_o: there is no significant relationship between macroeconomic variables and stock market movement in Ghana.

2. H_0: there is no moderating effect of control of corruption on relationship between macroeconomic variables and stock market movement in Ghana.

Significance of the Study

This study in the view of the researcher could be useful for the policy makers in Ghana to provide appropriate policies that will help enhance macroeconomic indicator as well as discourage corruption. In addition, it would contribute to literature because of the added corruption which would close the obvious research gap that already exists in the literature. It will also serve as a

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point of departure for further research in addition to providing information to future researchers who may be interested in studying these variables in Ghana.

Delimitation of the Study

This study examines the macroeconomic variables, corruption and stock market movement in Ghana using annual time series data set for the period 1990 to 2017. The study utilizes the Johansen's approach to co-integration within the framework of Vector Autoregressive (VAR) model developed by Sims (1987). The study employs the following main variables: gross domestic production per capita, inflation, money supply, control of corruption and stock market return.

Organization of the Study

This study is organized into five chapters. Chapter One, which is the introductory chapter, presents a background to the study, statement of the problem, purpose of the study, the hypotheses, significance, and delimitation of the study as well as organization of the study. Chapter two contains the review of relevant literature; both theoretical and empirical literature that underpins the study. Chapter three presents the methodological framework and techniques employed in conducting the study. Chapter four examines and discusses the results and main findings with reference to the literature. The final chapter presents the summary, conclusions and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

Introduction

The overall purpose of this chapter is to shed more light on related literature on the role of corruption in macroeconomic variables and stock market nexus in Ghana. That is, getting related theory and empirical review for the study. This chapter is organized into two main sections. The first section deliberates on theoretical literature on the role of corruption in macroeconomic variables and stock market nexus in Ghana. The second section in this chapter presents a review of empirical literature on the role of corruption in macroeconomic variables and stock market nexus in Ghana.

Theoretical review

This section concerned itself with theoretical review, which is theories that support the study.

Arbitrage Pricing Theory

Arbitrage pricing theory is a general theory of asset pricing that has become influential in the pricing of assets (Azeez & Obalade, 2019; Demir, 2019; Ibrahim & Musah, 2014). The theory was introduced mainly by Stephen Ross, an economist, in 1976 as an alternative to Sharpe's (1964) capital asset pricing model (CAPM). It is a multi-factor model in which every investor believes that the stochastic properties of returns of capital assets are consistent with factors structure. Ross (1976) argued that if equilibrium prices offer no arbitrage opportunities over static portfolio of assets, then the expected returns on the assets

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are approximately linearly related to the factor loadings or beta. This implies that, the expected returns of a financial asset can be modeled as a linear function of various macroeconomic variables or theoretical market indices, where the sensitivity to change in each factor is represented by a factor – specific beta coefficient. The model-derived rate of return would then be used to price the asset correctly and the asset price should equal the expected end of period price discounted at the rate r, implied by the model. If the price diverges, arbitrage should bring it back into line (Ibrahim & Musah, 2014).

The theory relates to this study because this study argues that stock market return is influenced by macroeconomic variables. This conform with Ross (1976) argument that in the arbitrage pricing theory, investors believe that the stochastic properties of returns of capital assets are consistent with macroeconomic factors.

The New Institutional Economics (NIE) Theory

The New Institutional Economics is a rapidly growing interdisciplinary field combing economics, law, organization theory, political sciences, sociology, and anthropology. It is helpful to "understand the institutions of social, political and commercial life" (Klein, 2005). The founding father of the New Institutional Economics is Ronald Coase, who, in 1937, wrote an article entitled "The nature of the firm". The term was coined by Olivier Williamson, who wanted to highlight the differences between the new economic ideas and the "old" institutional economics (Landreth & Colander,2005). The main idea of the new institutional economics theory posits that institutional structures have become increasingly blatant in economic activities.

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This new direction of economics deliberates that the cost of transacting is determined by institutions and institutional arrangements are key to economic performance (Nutassey, 2018). It was then argued that the institutions of a country such as its political, legal, and social systems determine its economic performance and financial market (Gatsi & Kyeraa, 2016). In other words, the nature of institution in Ghana has an impact on the financial market (stock market). This further implies that stock market return is influenced by corruption which is one of the indicators of institution. Simply, for stock market return to be high in Ghana, it needs a lower level of corruption (Gatsi & Kyeraa, 2016).

Empirical review

This section also reviewed prior study that are related to this study:

Macroeconomic variable and stock market movement

Azeez and Obalade (2018) argued that for stock market to contribute effectively and efficiently in its role of capital formation, the macroeconomic environment in which it operates must be conducive and growth supportive. Therefore, they conducted a study on macroeconomic determinant of stock market development in Nigeria for the period of 1981 to 2017. The study employed the Auto Regressive Distributed Lag bound testing technique to investigate the long run and short run relationship between the dependent variable (stock market development) and independent variables (Gross Domestic Product, banking sector development, stock market liquidity, foreign direct investment, inflation rate and savings rate). The result of the study showed that in both the short run and long run, key macroeconomic determinants of stock market

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development in the context of the Nigerian Stock Exchange Market are banking sector development, stock market liquidity, foreign direct investment and to an extent the income level (GDP) while inflation rate which measures macroeconomic stability, and savings rate do not significantly explain stock market development.

Also, Demir (2019) analyzed the impacts of some macroeconomic factors on the Turkish Stock Market index, BIST-100 (Borsa Istanbul-100). The study stated that for centuries, and mostly since the 20th century, stock markets are players of economies. It went further to explain that presently the largest economic crises arise from the stock market instabilities and thus, the stock markets are the focus of interest of the economy. Economists, investors, and policymakers try to predict the tendency of share prices, which substantially depend on foreign and domestic macroeconomic factors.

Hence, the study investigated the impact of some selected macroeconomic factors on BIST-100 index over the first quarter of 2003 to the fourth quarter of 2017. The findings obtained from the quarterly data via the ARDL bounds test suggested that economic growth, the relative value of the domestic currency, portfolio investments and foreign direct investments raise the stock market index while interest rate and crude oil prices negatively affect it. The results again revealed that the Istanbul Stock Exchange Market needs stronger domestic currency, higher international capital inflows, and lower energy and investment costs.

Again, Tsaurai (2018) undertook a study to explore the determinants of stock market development in emerging markets using the pooled ordinary least squares (OLS), fixed and random effects approaches with data ranging from 1994 to 2014. The emerging markets used in the study included Argentina, Brazil, Colombia, Mexico, Peru, Czech Republic, Greece, Poland, Portugal, Russia, Turkey, China, Hong Kong, Indonesia, India, Malaysia, Philippines, Republic of Korea, Thailand, Singapore and South Africa. The major factors influencing stock market development in line with empirical literature included Foreign direct investment (FDI), economic growth, infrastructural development, savings, inflation, trade openness, exchange rates, banking sector development and stock market liquidity. The impact of these factors on stock market development in emerging markets was then tested using an empirical model.

FDI, savings, economic growth, trade openness, exchange rates, banking sector development and stock market liquidity to a larger extent had a positive impact on stock market development in emerging markets. Majority of the findings on the determinants of stock market development resonate with theoretical literature. More so, a comparative analysis of macroeconomic variables and stock sarket performances in Africa (2000-2015) was studied by Worlu and Omodero (2017). The study aimed at evaluating the impact of macroeconomic variables on stock market performance in Africa from the period of 2000 to 2015. Four major African countries investigated were: Ghana, Kenya, South Africa and Nigeria. The specific objectives were to establish the extent to which GDP, inflation rate and real exchange rate affect the stock market

performance represented by share price index. Time series data were employed and analyzed using multiple regression and t-test for hypotheses testing. The result revealed negative impact of GDP, inflation and real exchange rate on Stock Price Index in Nigeria. Insignificant relationship of all the variables was also observed. The result for South Africa's stock market showed that GDP and inflation had a negative impact on stock market and real exchange rate has no impact on the stock market. The impact of GDP on Ghana's stock market was negative while the others had no impact. Real exchange rate had negative impact on Kenyan stock market, but GDP and inflation had no impact. The researchers therefore conclude that macroeconomic variables have to be checked by the government of African countries to avoid this scenario of negative effects since they are major determinant of the success of the stock markets in every economy.

Furthermore, Owiredu, Oppong and Asomaning (2016) examined macroeconomic determinants of stock market development in Ghana for the period 1992 to 2012 using annual secondary data from Bank of Ghana Quarterly Economic Bulletins, Ghana Statistical Service, Ghana Stock Exchange Market Statistics, the World Bank and International Monetary Fund's International Financial Statistics. The macroeconomic indicators such as the real income (GDP per capita income), domestic saving, stock market liquidity, financial intermediary growth, macroeconomic stability (inflation) and private capital flows with stock market capitalization used as a proxy were collected and used for the analysis. These variables were examined to establish a relationship with stock market developments based on a linear regression model. The regression analysis

found stock market liquidity to be statistically significant to stock market developments as opposed to other determinants (such as macroeconomic stability), real income and domestic savings and private capital flows) which were found to be non-significant. This result suggests that macroeconomic stability real income, domestic savings and private capital flows proved to have no significant impact on stock market development, since their regression coefficients were not statically significant at 5% level of significance.

Similarly, Tieku (2016) sought to investigate the effects of macroeconomic variables in Ghana Stock Exchange using time series analysis from the period of 2000-2013. Five macro-economic variables were used which include exchange rate, inflation rate, T-bill rate (proxy for interest rate) and Broad money supply (M2). Stock price was proxy as the All –share index where all these variables were obtained from the Ghana Stock Exchange and the Bank of Ghana as a secondary source. A test for unit root using Augmented Dickey Fuller was performed. This showed that the variables exhibited the presence of unit root at 95% confidence interval. Further Johansen and Julius trace and maximum Eigen value tested for co-integration came out to test for the existence of Long run relation among the variables where lastly this was followed by the estimation of vector error correction module of the short and long run impact relationship among the selected macroeconomic variables and stock price.

In addition, Prempeh (2016) empirically examined the impact of some macroeconomic variables on stock price volatility on the Ghana Stock Exchange (GSE) using annual time series data over the period of 1990-2014. Secondary data

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on the performance of the stock exchange (GSE-All Shares index) macroeconomic variables were used. The macroeconomic variables used in this study are inflation rate, real gross domestic product growth rate and interest rate. The Granger causality test was employed to determine the causal link between stock prices and macroeconomic variables in Ghana. The results of the Granger causality test showed that at 10% significance level, real gross domestic product rate causes stock price but stock price does not granger cause real domestic product rate. There is, therefore, a unidirectional causality running from real gross domestic product growth rate to stock price. Other variables: inflation rate and interest rate do not granger cause stock prices. This shows that a shock in real domestic product growth rate affects stock price volatility in Ghana.

Prempeh (2016) recommended that the Ghana Stock Exchange should track likely factors that are responsible for stock price volatility and also stabilize stock price movement; real gross domestic product growth rate should be one of the main factors to be addressed apart from other internal factors that affect liquidity such as stock market liquidity and volume of shares. Laws and regulations governing the operations of the stock exchange should be strengthened to protect the interest of buyers and sellers on the stock market. This will increase the confidence of investors as well as boost domestic investor participation and enlarge stock ownership base in the economy.

Moreover, Rakhal (2018) investigated the effect of selected macroeconomic factors (remittances, money supply, exchange rate, and interest rate) on stock market performance based on literatures available in international

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and Nepalese context. The study demonstrated that remittance and money supply positively affect the stock market whereas interest rate and exchange rate negatively affect the stock market performance. However, there is lack of consensus on the effect of each macroeconomic variables on stock market performance.

Also, Barnor (2014) examined the relationships between selected macroeconomic variables and their effect on the stock market returns on the Ghana stock market. The research questions addressed whether macroeconomic variables had significant effect on stock market returns in Ghana within the specified period. The target sample was all 36 listed firms on the Ghana stock market. Data were obtained from the Bank of Ghana bulletins, the Ghana Statistical Service, and the GSE. Time-series data analysis was used to determine whether there was a statistically significant relationship between stock market returns and inflation rate, exchange rate, interest rate, and money supply. The findings revealed that interest rates and money supply had a significant negative effect on stock market returns. However, exchange rates had a significant positive effect on stock market returns. Moreover, inflation rate did not significantly affect stock market returns in Ghana.

Again, Isshaku, Ustarz and Domanban (2013) assessed the existence of causality between macroeconomic variables and stock returns in Ghana. The study employs monthly time series data spanning the period January 1995 to December 2010. Unit root test was performed using ADF, PP and KPSS tests. Then, Vector Error Correction (VECM) model was used to establish long-run and

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short-run relationship between stock performance and macroeconomic variables. In order to determine the existence or otherwise of causality, the Granger Causality tests was performed. Impulse response functions and forecast error variance decomposition are used to assess the stability of the relationship between stock returns and macroeconomic variables over time.

The study revealed that a significant long run relationship exists between stock returns and inflation, money supply and foreign direct investment (FDI). In the short-run also, a significant relationship exists between stock returns and macroeconomic variables such as interest rate, inflation and money supply. In the short-run the relationship between stock returns and FDI is only imaginary. The VECM coefficient showed that it takes approximately 20 months for the stock market to fully adjust to equilibrium position in case a macroeconomic shock to occur. Lastly, a causal relationship running from inflation and exchange rate to stock returns has been established. Then also, a causal relationship running from stock returns to money supply, interest rate and FDI has also been revealed. The findings imply that arbitrage profit opportunities exist in the Ghana stock market contrary to the dictates of the Efficient Market Hypothesis (EMH).

According to Ofori – Abebrese, Amporfu and Sakyi (2016), the efficient market hypothesis proposes that macroeconomic policy actions do not influence stock market development but the Tobin's Q theory argues otherwise. The study used ARDL technique to investigate the impact of macroeconomic policy on the development of the Ghana Stock Exchange for the period 1991-2011. It found that government revenue and exchange rate reduce stock market development. A

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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.

Finally, Kyereboah-Coleman and Agyire-Tettey (2008) aimed at examining how macroeconomic indicators affect the performance of stock markets by using the Ghana Stock Exchange as a case study. Quarterly time series data covering the period 1991-2005 were used. Cointegration and the error correction model techniques were employed to ascertain both short- and long-run relationships. Findings of the study revealed that lending rates from deposit money banks have an adverse effect on stock market performance and particularly serve as major hindrance to business growth in Ghana. Again, while inflation rate was found to have a negative effect on stock market performance, the results indicated that it takes time for this to take effect due to the presence of a lag period; and that investor's benefit from exchange-rate losses as a result of domestic currency depreciation.

From the above review study, it was identified that none of the studies have included the role of corruption in the relationship between macroeconomic variable and stock market in Ghana. Thus, this study fills the research by examining how corruption moderates the relationship between macroeconomic variables and stock market returns in Ghana.

Control of corruption and stock market movement

Boadi and Amegbe (2017) investigated the relationship between quality of governance and stock market performance within the context of international markets. The study employed the fixed effect model using 23 countries with complete relevant data for the period spanning from 1996 to 2014. Findings from their study revealed that, quality of governance as captured by voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law and control of corruption significantly affect stock market performance in Ghana. Therefore, control of corruption influence stock market performance. Thus, this study considered the unique features of Ghana stock exchange.

Conceptual Framework

The framework revealed the role of corruption in the relationship between macroeconomic variable and stock market movement in Ghana. In other words, this study argues that for macroeconomic to fully cause a positive movement in the Ghanaian stock market, the corruption rate in Ghana need to controlled. Therefore, both macroeconomic variables and corruption is required to bring a profitable stock market in Ghana. This is shown in the conceptual framework.
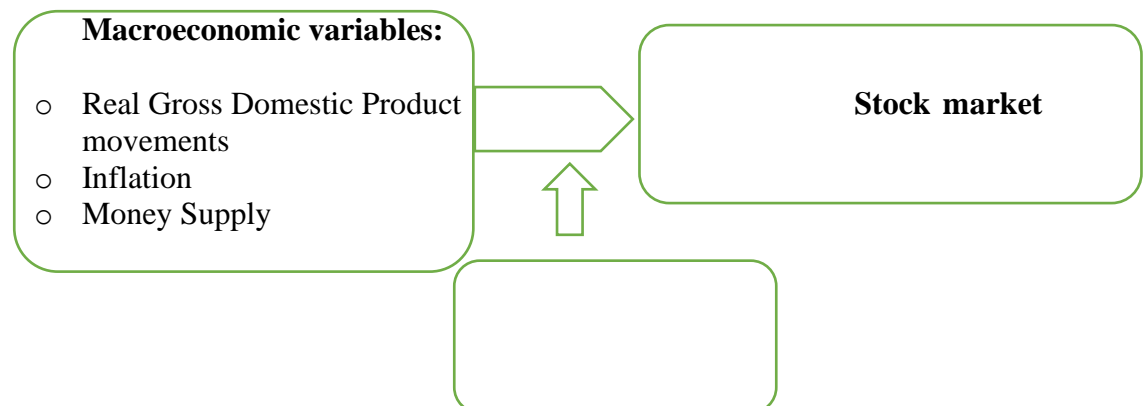
Corruption

Figure 1: Conceptual Framework of the study
Source: Author's own construct (2020)

Chapter Summary

This chapter started by reviewing theories that underpins the relationship between macroeconomic variables and stock market returns in Ghana: the role of corruption. Specifically, the study reviewed arbitrage pricing theory and new institution theory. While arbitrage pricing theory explained that movement in stock market return is influence by macroeconomic variable, the new institutional theory threw more light on the how corruption affect stock market. The second section also concentrated on empirical review that is studies related to this study which were conducted earlier. After reviewing the studies above, it was realized that no study has yet been conducted in Ghana that has analyze the role of corruption in macroeconomic and stock market nexus. Thus, this study intend contributing to literature by conducting this topic in the context of Ghana.

CHAPTER THREE

RESEARCH METHODS

Introduction

This chapter presents the methodology employed in the study. Precisely, it gives a detailed description of the study design, specification of the model, definition and measurement of variables in the model, estimation techniques, sources of the data, and tools for data analysis.

Research Paradigm

According to Hallebone and Priest (2008), research paradigm reflects the philosophy of a scientific research and the scientific approach that is considered most appropriate to the purpose, context and focus of the research task. Basically there are two main traditional paradigms to undertaking a study, namely, the positivist and constructivist method. The opinion of these two traditional approaches about the way a study is conducted plays a vital role in finance research as well as business research in general (Saunders, Lewis & Thornhill, 2009). Positivist paradigm is explained by Buchanan and Bryman (2009) as objective epistemological viewpoints that apply the methods of natural sciences to social reality study and beyond.

Proponents of this approach believe that knowledge is shaped deductively from a theoretical or hypothetical point of view; therefore, theories are tested hypothetically with the notion to either reject or fail to reject a theory. Under this approach, phenomena are subjected to theories that are propounded in a logical means by way of empirically testing the applicability of the theory by using

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inductive and deductive hypotheses formulated (Wahyuni, 2012). The positivist approach is adopted for this study due to the fact that constructs being researched could be objectively described and measured, analyzed and interpreted using theoretical models (agency and institutional models). The study as well is purely quantitative and had developed two hypotheses based on theoretical models hence the choice of the positivist paradigm.

Research Design

Research design can be exploratory, descriptive or explanatory (Saunders, Lewis & Thornhill, 2009). The study employed the explanatory research design. Explanatory research design investigates the cause and effect of one or a set of variables (independent) on another variable (dependent) in a theoretical model that is developed (Saunders et al., 2012). Explanatory research design places importance on studying a situation to explain the relationships between variables. The study is grounded on explanatory research design since it sought to examine the cause and effect of macroeconomic variables, corruption and stock market movement in Ghana. quantitative method is appropriate for this study since it would develop a mathematical model and ensure objective analysis. Implementing a quantitative method provides results that could be reduced to statistics; countenancing statistical comparison between entities; results are precise, definitive and standardize (Sukamolson, 2005). Quantitative study favours deductive approach which confirms, validates and test hypotheses about a theory (Leedy & Ormorod, 2010).

Models Specification

The study adopted the autoregressive distributed lag (ARDL) model to investigate the objectives of this study which assess the relationships (short and long term) among macroeconomic variables, corruption and stock market returns. To model data appropriately and extract long run and short run relationships, the ARDL model is a good choice (Adam & Owusu, 2017). The ARDL model combines the features of both autoregressive (AR) and the distributed lag (DL) models to manage a more general dynamic regression model. Lagged values of explanatory variables or of the dependent variable (or both) may capture important dynamic structure in the dependent variable that might be caused by a number of factors.

Pesaran and Shin (1998) and Pesaran, Shin and Smith (2001) itemised some features of the ARDL or bounds testing methodology of cointegration to include the following: that the data being modeled must be stationary at level I(0) or at first difference I(1) but not at the second difference I(2); that the model involves just a single-equation set-up, making it simple to implement and interpret; different values can be assigned different lag-lengths as they enter the model.

To use the ARDL model, the researcher must ensure that none of the variables are integrated at the second difference I(2) and the unrestricted error correction model be formulated. The appropriate lag structure was determined for the ARDL model by using the Akaike Information Criterion. Serial correlation test was checked to ensure that the errors of the model are serially independent.

Also, parameter stability test was conducted by using the CUSUM test to ensure that the model is dynamically stable (Pesaran & Shin, 1998). Bound testing was performed to see if there is evidence of a long run relationship between the variables in question. When the evidence of long run relationship was found between the variables, the long run level models were estimated as well as a separate restricted Error Correction Model (ECM) (Pesaran, Shin & Smith, 2001). Finally, the results of the long run levels model as well as the restricted ECM were used to measure short run dynamic effects, and the long run equilibrating relationship between the variables. The compact form of the ARDL model is indicated in equation 2.

$$\Delta SMR_t = \beta_1 + \sum_{i=1}^{a} \beta_2 \Delta SMR_{t-i} + \sum_{i=0}^{b} \beta_3 \Delta INF_{t-i} + \sum_{i=0}^{c} \beta_4 \Delta LMS_{t-i}$$

$$+ \sum_{i=0}^{d} \beta_5 \Delta GDP_{t-i} + \emptyset_1 SMR_{t-1} + \emptyset_2 INF_{t-1} + \emptyset_3 LMS_{t-1}$$

$$+ \emptyset_4 GDP_{t-1} + \mu_t \qquad (2)$$

- Where SMR = Stock Market Return (Dependent variable)

- INF = Inflation

- LMS = log of money Supply

- GDP = Log of Gross domestic Product

- t = Time series,

- β_1 to β_5 and $\emptyset_1$ to $\emptyset_4$ = Coefficient of the independent variables,

- $a\ to\ d$ represent the highest lag length for the variables, and μ = Error term.

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Next, to test the moderating effect of control of corruption on the relationship between macroeconomic variables and stock returns, the study interacted the macroeconomic variables with the control of corruption variable. The model is presented below:

$$SMR = \emptyset_1 INF_t + \emptyset_2 LMS_t + \emptyset_3 GDP_t + \emptyset_4 CRP_t + \emptyset_5 (INF * CRP)_t + \emptyset_6 (LMS * CRP)_t + \emptyset_7 (GDP * CRP)_t + \mu_t$$

Where SMR = Stock Market Return (Dependent variable), INF = Inflation, LMS = log of money Supply, GDP = Log of Gross domestic Product, CRP is control of corruption t = Time series, $\emptyset_1$ to $\emptyset_7$ = Coefficient of the independent variables, and μ = Error term.

Definition and Measurement of Variables

For the purpose of this study, the following measurement and operational definitions would be used for the variables being examined.

Dependent Variable

The study sought to examine how corruption affects the relationship between macroeconomic variables and stock returns. Thus, the dependent variable of the study is stock market return.

Stock market movement

Stock market movement is measured by Ghana stock exchange log return representing stock performance. The equally weighted return index is used to compute return Index following Aga and Kocaman (2006).

Independent variables

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The study sought to examine how corruption affects the relationship between macroeconomic variables and stock returns. Thus, the independent variables of interest were inflation, real gross domestic product, money supply and corruption.

Inflation (INFL)

Inflation is defined as a sustained increase in the general level of prices for goods and services. It is measured as a percentage change in the cost to the average consumer of acquiring a fixed basket of goods and services at specified intervals, such as yearly, monthly, daily etc. Continuous increases in the general price level of the economy may result in uncertainty about the future profitability of stock market. This is because higher prices of consumer goods and services may dampen demand for goods and services in the economy and for this reason, stock market return may be affected negative, since this would to lower levels of investment and economic growth. A number of studies have established negative relationship between inflation and stock market performance (Al- Abbadi & Abdul- Khaliq, 2017; Khan, 2004).

Real GDP Per Capita

GDP is the total output of a country. This is used as a proxy for market size and it will be measured as the real GDP divided by the total population (WDI, 2019). By removing internal barriers to trade, a free trade area or customs union gives firms the opportunity to serve an integrated market from one or a few production sites, and thereby to reap the benefits of scale economies. This can have a pronounced impact on the stock market return at least while firms are

restructuring their production activities. There is fairly a strong evidence of association between economic growth and stock market returns (Prempeh, 2016; Mireku, Sarkodie & Poku , 2013).

Money supply

It embodies the broad money supply in the Ghanaian economy. An increase in money supply would increase the liquidity in the economy resulting in an increase in the purchasing power of the citizenry (Issahaku, Ustarz & Domanban, 2013). This means that more money would be available not just for consumption but also for investment and thus, translate into the stock market. Positive nexus of money supply and stock market has been proven (Baffour, 2016; Kpanie & Esumanba, 2014).

Interacting variable

Control of Corruption explain the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests (WDI, 2019). Many studies have argued that corruption have great impact on stock market movement (Boadi & Amegbe, 2017; Winful, Sarpong & Agyei – Ntiamoah, 2016)

Estimation Techniques

Based on the recommendation of Adam and Owusu (2017), this study explored the stationarity properties of the variables using the Augmented-Dickey-Fuller (ADF) test procedure. This test was done in order to avoid spurious regression which is a common problem among most of the governance indicators whose data generation processes follow a time trend. The ADF test tests the null

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hypothesis that the variables have unit root as against the alternative hypothesis that the variables are stationary. The study then resorted to the ARDL framework to estimate the long run and short run relationships between macroeconomic variables and stock market returns.

Time Series Properties of the Variables

The variables were tested for their time series properties by using unit root test. The test for unit root in the variables was investigated by using the Augmented Dickey Fuller (ADF) test. The ADF was tested on the null hypothesis that the variable has a unit root (non-stationarity). The preliminary test revealed that GDP is stationary at level and all the other variables were stationary at level and at first difference. This means that stock returns and the independent variables could be used in the ARDL model. The ADF test was defined as:

$$\Delta y_t = B_1 + B_2 t + B_3 y_{t-1} + \sum_{i=1}^{m} a_i \Delta y_{t-i} + e_t \quad (3)$$

Sources of Data

In this study, stock market return was used as the dependent variable and some macroeconomic variables were the independent variables. All the variables used in the models were based on the existing literature reviewed on the topic, economic theory, and whether they fit well in the models in statistical terms. The time span covered in the study was from 1996 to 2019 and annually time series data was used. The data used for this study are secondary data. Data on stock market return was from Bank of Ghana, control of corruption from worldwide governance indicators, and the macroeconomic variables (real gross domestic

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product, inflation and money supply) were collected from the World
Development Indicators (World Bank, 2019).

Chapter Summary

This chapter discussed the research methods used in this study. This study
was mainly quantitative in it approach. It also used the explanatory research
design because it investigates the cause and effect of one or a set of variables
(independent) on another variable (dependent). The data was from WDI and Bank
of Ghana. The study adopted the ARDL econometric model. The tool used to run
the analysis was E-View 10.0

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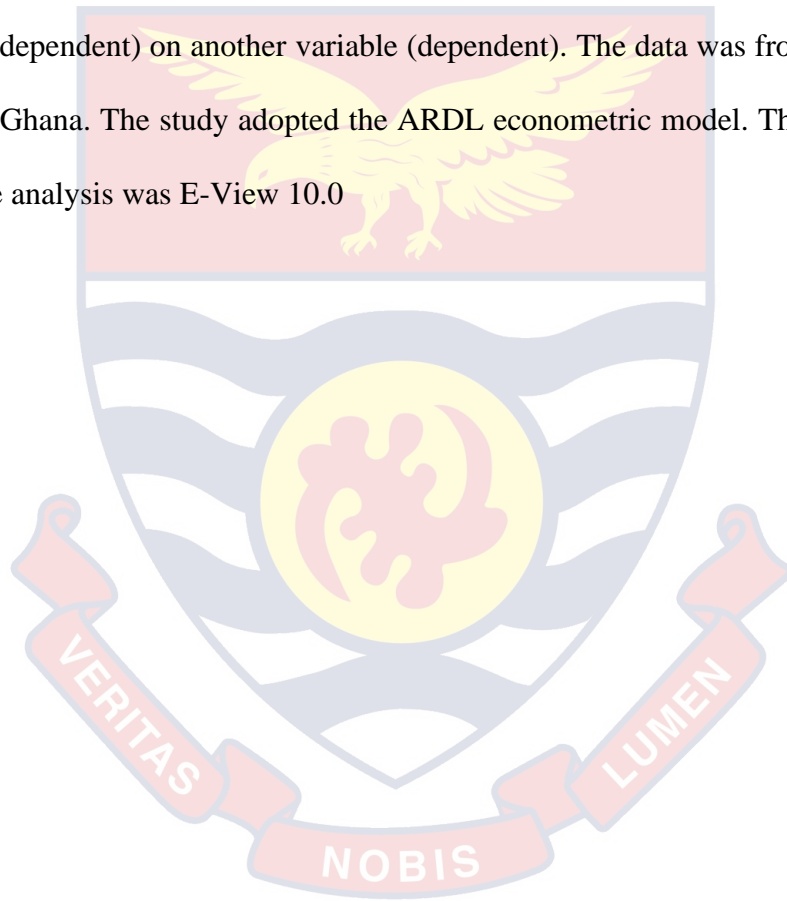
CHAPTER FOUR

RESULTS AND DISCUSSIONS

Introduction

This chapter focuses on the results obtained on the various objectives. The chapter also discusses the results in relation to each objective. The study examined the short run and long run relationships among macroeconomic variables, corruption and stock market returns in Ghana. ARDL model was used in analysing the objectives and data were collected from the IMF website from 1996 to 2019 but was quaterlised to generate enough data point.

Descriptive Statistics of Variables

Table 1 present the descriptive statistics of the variables. It provided information on mean, standard deviation, minimum and maximum. The total number of observations was 92. The dependent variable Stock market return has a mean (20.612) that is greater than its standard deviation (3.762) which implies, there is less variability around the mean. The mean value of the Money Supply is 31.843 with a standard deviation of 6.451. Log GDP and INF have mean values of 1013.811 and 20.139 that are greater than their standard deviation of 12.633 and 1.377 respectively. Therefore, both variables of interest and control variables are less variability around the mean. The rate of inflation had a minimum value of 8.727 with a maximum value of 59.462 which suggest that the series characterised a period with high inflation rate in the country.

Table 1: Descriptive Statistics of Variables

Variable	Mean	S. D.	Min.	Max.	No. of Obs
SMR	10.612	3.762	4.080	17.480	92
MS	31.843	6.451	15.994	76.048	92
GDP	013.811	12.633	100.615	1301.073	92
INF	20.139	1.377	8.727	59.462	92

Source: Author's Construct (2020)

Unit root Test

The study tested for the stationarity of the variables used in the study by using the Augmented Dickey Fuller (ADF) test. The ADF test is tested under the null hypothesis that the variable in question has unit root against the alternative hypothesis that the variable has no unit root. Each ADF test was tested at alpha level of 5%. The summary result for the unit root testing is shown in Table 1.

Table 2 indicates that the null hypothesis for ADF was rejected and the conclusion of stationarity was achieved for Gross Domestic Product (GDP) at I(0) and I(1) for Inflation (CPI), Money Supply and Stock Market Return. This means that Gross Domestic Product is stationary at levels whereas Consumer Price Index (CPI), Money Supply and Stock Market were stationary at first difference. With respect to the autoregressive distributed lag (ARDL) model, if a variables is integrated at order 2 it cannot stay in the ARDL model. But once the stationarity test for the variables were a mixture of I (0) and I (1), there is no problem when they are modeled together in the ARDL test for co-integration.

Table 2: Unit root tests

Variable	ADF	Probability
GDP	I(0)	0.0001
INF	I(1)	0.0000
MS	I(1)	0.0000
SMR	I(1)	0.0001

Source: Author's Construct (2020)

Autoregressive Distributed Lag (ARDL) model

The study used ARDL model to assess the cointegration relationship between macroeconomic variables and stock market return. The ARDL model selects the optimal model which has the least information criterions. The study found that the best selected model is ARDL (1, 3, 4, and 4) with the Akaike Information Criterion (AIC) value of 3.3. To ensure that ARDL (1, 3, 4, and 4) is the best model, it could be seen from Figure 1 that ARDL (1, 3, 4, and 4) has the least AIC value of 3.3 as compared to all other lag orders making it the best model. Thus, stock market return being the dependent variable has lag length of 1, inflation has lag length of 3, money supply has lag length of 4, and GDP also has lag length of 4.

The ARDL result is displayed in Table 3. From Table 3, the current level of stock market return is determined by the first lag of stock market return, the current level of inflation and first to the third period lags of inflation. The current level, first to the fourth period lags of both money supply and gross domestic product influence the current level of stock market returns in Ghana.
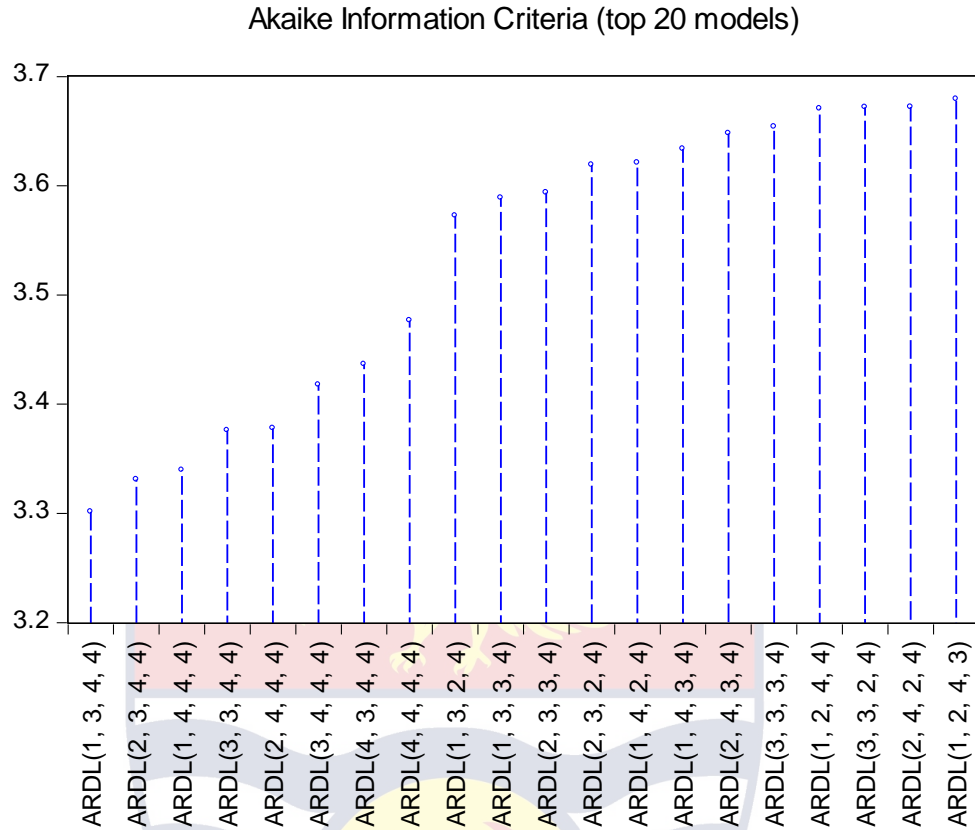
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Figure 2 : AIC lag selection graph
Source: Author's Construct (2020)

From the result, nine out of fifteen of the regressors were found to influence stock returns at 5% significant level. The first period lags within the ARDL (1, 3, 4, 4) model represents the long run components within the model.

Table 3: ARDL (1, 3, 4, 4) model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SMR(-1)	0.410282	0.117236	3.499620	0.0026
INF	-0.376041	2.713795	-0.138566	0.8913
INF(-1)	-1.047341	3.181427	-0.329205	0.7458
INF(-2)	-8.865900	2.644060	-3.353139	0.0035
INF(-3)	-13.47639	5.612409	-2.401178	0.0274
MS	0.077503	0.025681	3.017915	0.0074
MS(-1)	0.069090	0.025481	2.711421	0.0143
MS(-2)	0.084188	0.026770	3.144893	0.0056
MS(-3)	0.032335	0.023082	1.400862	0.1783
MS(-4)	0.048413	0.022572	2.144855	0.0459
GDP	0.116176	0.091512	1.269525	0.2204
GDP(-1)	0.296695	0.156909	1.890875	0.0748
GDP(-2)	1.214427	0.317686	3.822721	0.0012
GDP(-3)	0.115310	0.311996	0.369587	0.7160
GDP(-4)	-0.907936	0.314495	-2.886967	0.0098
C	-7.066660	3.234388	-2.184852	0.0424

R square:	0.831898
F-statistic:	5.938520
Prob. F-Statistic	0.000284
Durbin-Watson Stat.:	2.044070

Source: Author's Construct (2020)

Diagnostics on ARDL

Table 3 shows the results on the autoregressive distributed lag model. The key motivation for the ARDL model is that even if some of the variables are non-stationary as suggested by the ADF and Phillips-Perron unit root test, then, a linear combination of these variables will make the stationary. Again, it was evidenced from the from the ADF test that many of the variables used in the model have autocorrelation. That is the lags of these variables must be taken into consideration in the estimation of the model which OLS fail to do.

Interestingly, the money supply and the rate of inflation are both not significant in the ARDL model. Again, it can be observed that current or present GDP as well it lags were all statistically significant.

Test for Serial Correlation

The study tested for the existing or non-existence of serial correlation and heteroscedasticity in the ARDL (1, 3, 4, 4) model. The Durbin-Watson (DW) statistic of 2.044 is a good indication of no serial correlation, but a further test with Breusch-Godfrey Serial Correlation LM Test was conducted and the result is shown in Table 4. From Table 4, the probability of the F-statistic = 0.093467 is 0.9100 which is greater than 0.05 significant level. The study cannot reject the null hypothesis of no serial correlation in the error terms at the 5% level of significance. In other words, the study found no serial correlation in the error term of the ARDL (1, 3, 4, 4) model.

Table 4: Breusch-Godfrey Serial Correlation Test of ARDL (1, 3, 4, 4) model

F-statistic	0.094367	Prob. F(2,303)	0.9100
Obs*R-squared	0.196709	Prob. Chi-Square (2)	0.9063

Source: Author's Construct (2020)

Test for Serial Heteroscedasticity

The study tested for the assumption that the ARDL (1, 3, 4, 4) model has a constant variance (homoscedasticity). The study used the Breusch-Pagan-Godfrey test to ascertain if there is constant variance at alpha level of 5%. To this extent, the Breusch-Pagan-Godfrey test of heteroscedasticity was conducted at 5% sig level and under the null hypothesis of constant variance as against alternative hypothesis of no constant variance in the ARDL model. The result of heteroscedasticity is displayed in Table 5.
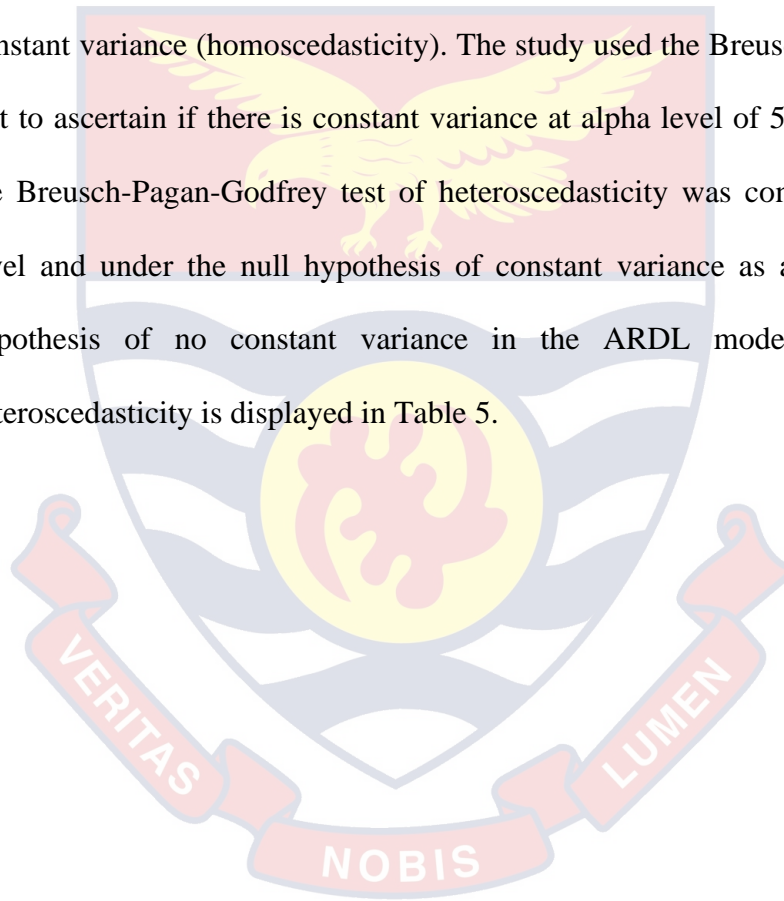
Table 5: Breusch-Pagan-Godfrey test of heteroscedasticity

F-statistic	0.778716	Prob. F(15,18)	0.6846
Obs*R-squared	13.38057	Prob. Chi-Square (15)	0.5729
Scaled explained SS	3.862268	Prob. Chi-Square (15)	0.9982

Source: Author's Construct (2020)

From the Breusch-Pagan-Godfrey test of heteroscedasticity shown in Table 5, the probability value of the F-statistic of 0.778716 is 0.6846 which is more than 5%. The study therefore, fails to reject the null hypothesis of homoscedasticity. In effect, the study concludes that there is constant variance in the error term of the ARDL (1, 3, 4, 4) model.

Test for Model Stability

The study also tested for the stability of the ARDL model and the result is indicated by Figures 2 and 3. Pesaran (1997) argued that it is extremely important to ascertain the consistency of the long run multipliers by testing the error correction model for the stability of its parameters. Brown, Durbin, and Evans (1995) introduced the commonly used tests for this purpose as the cumulative sum (CUSUM) test and CUSUM of squares test. As Figures 2 and 3 reflects, the ARDL (1, 3, 4, 4) is stable over time since the thick dark line falls within the two dotted bounds. Therefore, the stability of the ARDL model is not questionable given that both the CUSUM curve which lie within the 95% confidence boundaries.
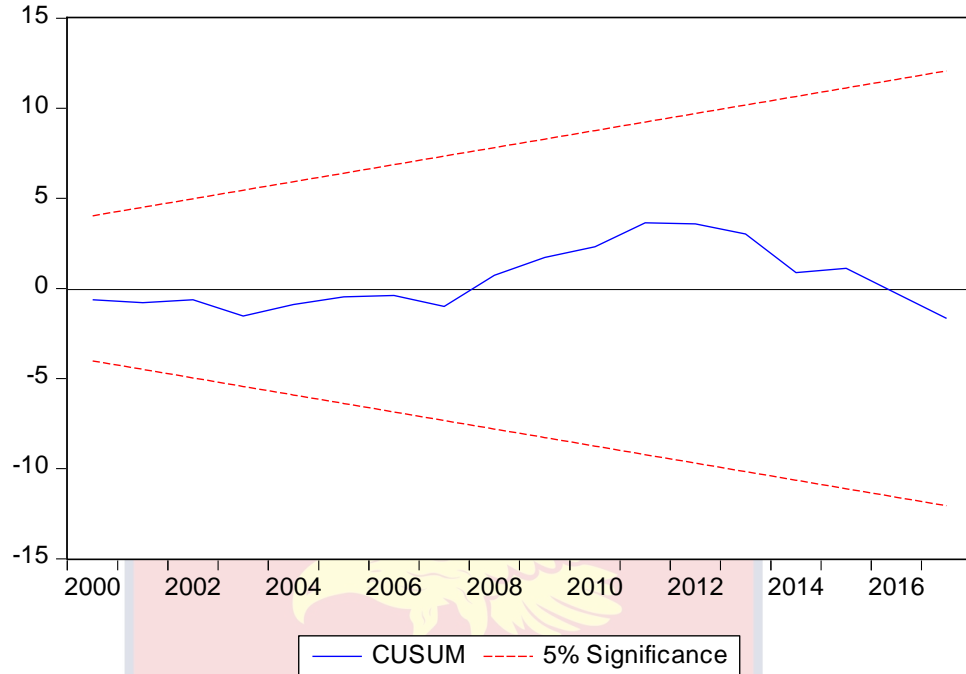
Figure 3: *CUSUM Test of stability*
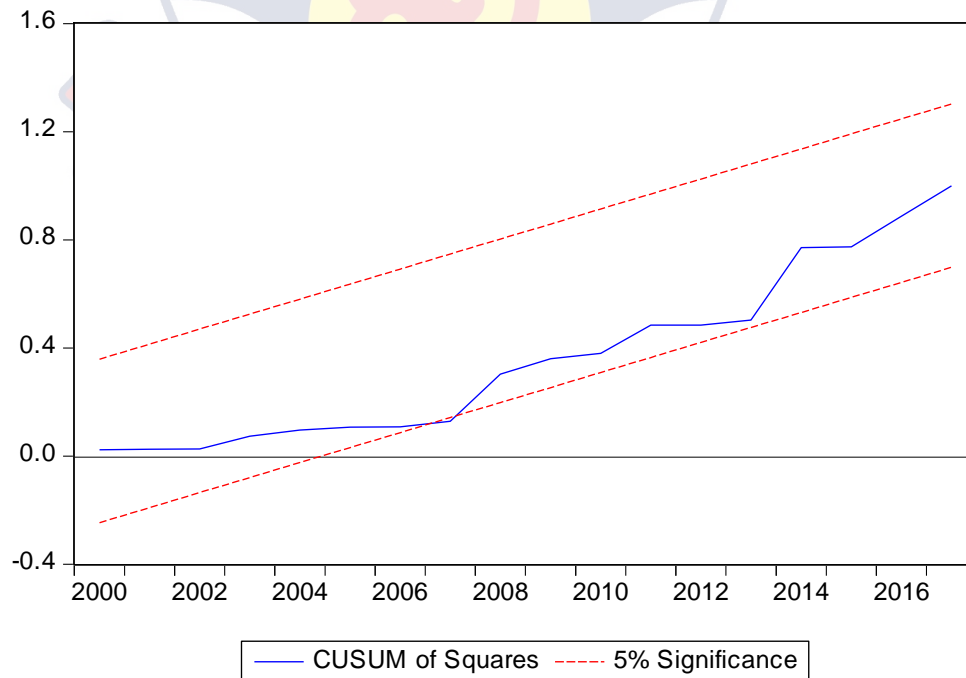Source: Author's Construct (2020)

Figure 4: *CUSUM of Square Test of stability*
Source: Author's Construct (2020)

Goodness of fit test

The study tested for the degree to which the independent variables in the model fit or explain the dependent variable in the ARDL (1,3,4,4) model. A cursory look at the $R^2 = 0.83$ in Table 3 with the probability of the F-statistic (P-value = 0.000284) is an indication that the regressors put together do a good job by explaining the variation in the dependent variables. In other words, the variation in stock market returns is explained by approximately 83% by the regressors put together. Only 19% of the variation in stock market returns cannot be accounted for by the all the independent variables. The study therefore concludes that there id goodness of fit in the ARDL (1,3,4,4) model.

Short run relationship between macroeconomic variables and stock market return

The first objective of this study examined the relationships between macro-economic variables (short and long run) and stock market returns. The study used the least square regression method and the result of the short run relationship is displayed in Table 5. Included in the short run model is the error correction term (ECT) which a lag of one which is an indication of the speed of adjustment towards long run equilibrium in the market. The least square linear regression model was used in analysing the short run relationship. The dependent variable was stock market returns with the macroeconomic variables being the independent variables.

Table 6: Short run model and error correction term

Dependent Variable: EG

Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistics	Probability
C	3.656098	1.351365	2.705484	0.0113
INFL	-3.183168	1.250944	-2.544612	0.0165
MS	0.074112	0.025171	2.944337	0.0063
GDP	0.027604	0.030389	0.908345	0.3712
ECT(-1)	-0.906913	0.352805	-2.570579	0.0156
R-squared	0.399731	Durbin-Watson stat		1.725227
F-statistic	4.827911			
Prob (F-statistic)	0.004152			

Source: Author's Construct (2020)

From Table 6, the study noted that the coefficient of the error correction term, ECT (-1) is negative and significant and this is appropriately so since there is a cointegrating relationship amongst the variables. The magnitude of the ECT is approximately 0.91 (that is, 91%). This implies that nearly 91% of any disequilibrium in the market is corrected within one year. In generic terms, the coefficient of the ECT (-1) is the parameter indicating the speed of adjustment to the equilibrium level after a shock. This means that the whole system correct itself back to equilibrium in the long run at a speed of 91%. In other words, it takes 1.1 (that is, $\frac{100\%}{91\%} = 1.10$) years for the market to adjust to long run equilibrium. As a rule of thumb, the coefficient of the ECT must be negative and statistically significant to ensure convergence of the dynamics to the long-run equilibrium.

Table 6 further indicates that inflation and money supply significantly influences stock market return in Ghana in the short run. GDP was found not to be statistically significant in influencing stock market return at least in the short run. From Table 6, a unit inflation of the cedi will decrease stock market returns by 3.183168% while a unit increases in money supply will increase stock market returns by 7.41%. The estimated regression equation for the short run is thus indicated by equation (5).

$$SMR = 3.656098 - 3.183168INF + 0.074112MS \qquad (5)$$

The result of this study has shown that in the short run, inflation negatively influences stock market returns while money supply and GDP positively influences stock market return. This results is in line with that of Worlu and Omodero (2017) who found that GDP and money supply had a positive effect on inflation while inflation had a negative impact on stock market and real exchange rate has no impact on the stock market. Again the results is in sync with that of Owiredu, Oppong and Asomaning (2016) who found that GDP, although positive, had no significant effect on stock market returns. Further, the results corroborates that of Barnor (2014) who found that contradicts that of Prempeh (2016) who found that at 10% significance level, real gross domestic product rate granger causes stock price but other variables like money supply and inflation rate do not granger cause stock market returns.

Diagnostics on the short run model

The result in Table 6 produces an R-square of 0.399 with an F-statistic = 4.827 and P-value of 0.004152. The value of the R-square implies that the

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regressors in the model accounts for up to 39.9% of the variation in the dependent variable (stock market returns). The probability of the F-statistic of less than 5% implies that the R-square value is statistically significant. Furthermore, a Durbin Watson value of 1.7 (approximately 2) implies that there is no serial correlation in the error term of the short run model produced in Table 6.

Furthermore, the study assessed whether or not the error term in the model has a constant variance. This test was conducted using the Breusch-Pagan-Godfrey test of heteroscedasticity under the null hypothesis that the error term has a constant variance. The result is displayed in Table 7. From the result, the probability of the F-statistic = 0.453653 is P(0.6401) > 0.05. The study therefore cannot reject the null hypothesis of constant variance in the error term. This result confirms that the model indicated in Table 6 is a good one.

Table 7: Breusch-Pagan-Godfrey test of heteroscedasticity

F-statistic	0.453653	Prob. F(2,27)	0.6401
Obs*R-squared	1.105389	Prob. Chi-Square (2)	0.5754

Source: Author's Construct (2020)

The study also tested for the stability of the short run model and the result is indicated by Figure 4. Pesaran (1997) argued that it is extremely important to ascertain the consistency of the long run multipliers by testing the error correction model for the stability of its parameters. Brown, Durbin, and Evans (1995) introduced the commonly used test for this purpose as the cumulative sum (CUSUM) test. As Figure 4 reflects, the short run model is stable over time since the thick dark line falls within the two dotted bounds. Therefore, the stability of

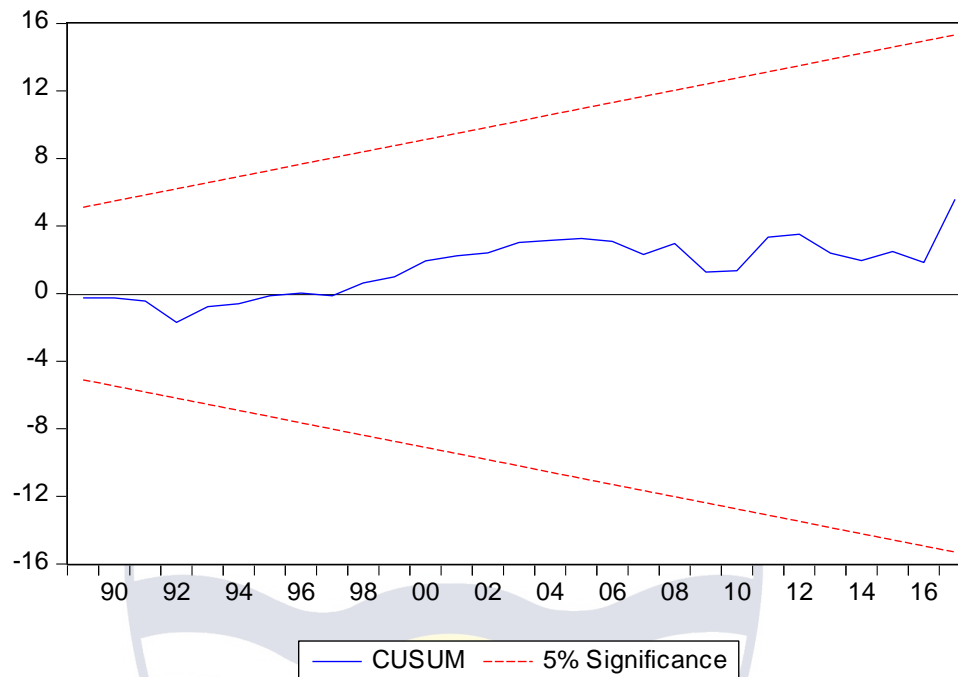the short run model is not questionable given the CUSUM curve which lies within the 95% confidence boundaries.

Figure 5 : *CUSUM Test of stability*
Source: Source: Author's Construct (2020)

Long run relationship between macroeconomic variables and stock market return

The second objective of this study examined test the moderation role of corruption on the relationship between the macroeconomic economic variables and stock returns. To enable this, the study first examined the presence of a long run relationship between the macroeconomic variables and stock returns using the ARDL bounds testing. The Bounds test produces an indication of whether long run relationship exists in a model. The bounds test was performed under the null hypothesis that no long-run relationship exist as against the alternative hypothesis that long run relationship exist. The result of the Bound test is displayed in Table

8. From Table 8, the F statistic value = 30.02. This value is greater than the lower I(0) and upper bounds I(1) values at 10% and 5% alpha levels. The study therefore rejects the null hypothesis of no long run relationship. In summary, the study confirms that a long run cointegration exists among the macroeconomic variables and the stock returns.

Table 8: ARDL Bounds Test

Null hypothesis: No long run relationship exist			
Test statistic	Value	K	
F statistic	30.01899	3	
Critical value bounds			
Significance	I0	I1	
10%	2.37	3.2	
5%	2.79	3.67	
2.5%	3.15	3.08	
1%	3.65	4.66	

Source: Author's Construct (2020)

Having satisfied that a long run relationship exists, the study proceeded with the long run test using the least square multiple linear regression to examine the effect of each of the macroeconomic variables on stock returns. Further, each of the macroeconomic variables was interacted with the corruption index to examine whether corruption influences the relationship between the macroeconomic variables and stock market returns. The result of the long run model is produced in Table 9. From the result, it is clear that inflation again

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negatively affect stock market return in the long run. Money supply was also found to exert a positive influence on stock market return in the long run. Finally, GDP was found to have a positive influence on stock market return in the long run.

Table 9: Long run model

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	0.600891	2.214658	0.271324	0.7878
INF	-4.479938	2.202476	-2.034046	0.0498
MS	0.113143	0.043844	2.580584	0.0144
GDP	0.066499	0.030900	2.152071	0.0302
R^2	0.251939			
F statistic	3.816939			
Prob (F-statistic)	0.018489			
Durbin Watson	2.105968			

Source: Source: Author's Construct (2020)

The estimated regression model for the long run is indicated by equation (6).

$$SMR = -4.479938INF + 0.113143MS + 0.066499\ GDP \qquad (6)$$

The long run model in Table 9 indicates that a percentage increase in Inflation will decrease stock returns by 4.4799%. Furthermore, a percentage increase in money supply will increase stock market return by 0.113143%. Lastly, a percentage increase in GDP will increase stock market returns by 0.066499%. The result of this study is confirmed by the study of Issahaku et al (2013) who

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posited that all the macroeconomic variables such as inflation, GDP and money supply all affect stock market return significantly.

Statistical diagnostics on the long run model

The long run result produced in Table 8 produced an R^2 of 25.19% with a corresponding F statistic = 3.817 and P-value (0.018489) < 0.05 alpha. Since the P-value is less than the alpha level, the study concludes that the R^2 is significant in the long run model. Thus, the independent variables are able account for the variation in the dependent variable by 25.19%. A Durbin Watson statistic of 2.10 also indicates that there is no serial correlation in the error term of the long run model. This is so for the study because the DW value of 2.10 is approximately 2.0 which is a mark indication of zero correlation in the residual.

The CUSUM of Square test in Figure 5 also shows the stability of the long run model. As Figure 5 indicates, the long run model is stable over time since the blue contour line falls within the two red dotted bounds. Therefore, the stability of the long run model is not questionable given that the CUSUM of square curve lies within the 95% confidence boundaries.
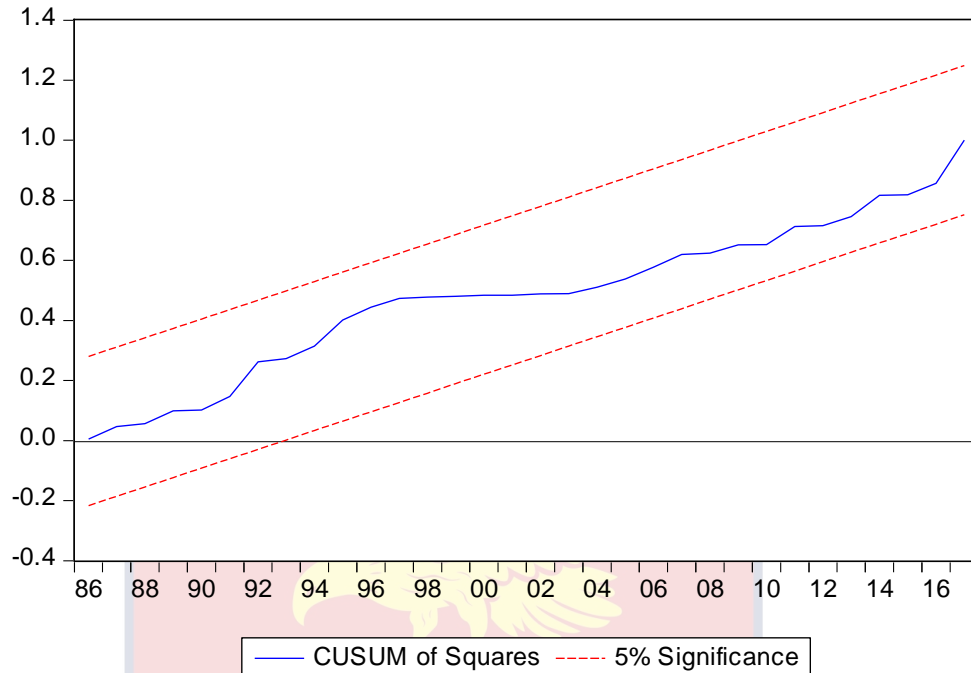
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Figure 6: CUSUM of square test of stability
Source: Source: Author's Construct (2020)

The long run effect of macroeconomic variables and stock market return:

The moderating role of corruption.

Each of the macroeconomic variables was interacted with the control of

corruption index to examine whether corruption influences the relationship

between the macroeconomic variables and stock market returns. The result of the

interaction terms are presented in the table below:

Table 10:Macroeconomic variables and stock market return: The moderating role of corruption

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	0.902894	2.615688	0.345184	0.8789
INF	-3.228995	1.152895	2.800771	0.0368
MS	0.122358	0.023386	5.232105	0.0012

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GDP	0.128868	0.028540	4.515347	0.0019
COR	- 0.00258	0.001250	-2.06400	0.0385
INF*COR	0.022185	0.005968	3.717325	0.0299
MS*COR	0.004788	0.001897	2.523985	0.0302
GDP*CO0R	0.001255	0.000494	2.540485	0.0311
R^2	0.5528963			
F statistic	8.2865789			
Prob (F-statistic)	0.0012583			
Durbin Watson	2.3885766			

Source: Author's Construct (2020)

The results in Table 10 reveal that on the overall, control of corruption will improve a positive effect of macroeconomic variables on stock performance. First, the introduction of the control of corruption variable led to a reduction in the negative coefficient of inflation as compared to the results in table 9. Also, the introduction of the control of corruption variables brought about an improvement in the positive effect of money supply and GDP on stock market returns.

Meanwhile, due to the high levels of corruption in Ghana, the absence of corruption coefficient was negative. Further, all the interaction terms between absence of corruption coefficients and the macroeconomic variables were positive. This shows that on the overall, low levels of corruption will improve stock market performance or return. This result is in line with that of Boadi and Amegbe (2017) who found that control of corruption positively influences stock market performance.

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Effect of corruption on macroeconomic variables and Stock market returns

The long run result produced in Table 9 produced an R^2 of 55.28963% with a corresponding F statistic = 8.2865789 and P-value (0.0012583) < 0.05 alpha. Since the P-value is less than the alpha level, the study concludes that the R^2 is significant in the long run model. Thus, the independent variables are able account for the variation in the dependent variable by 55.29%. A Durbin Watson statistic of 2.39 also indicates that there is no serial correlation in the error term of the long run model. This is so for the study because the DW value of 2.10 is approximately 2.0 which is a mark indication of zero correlation in the residual.

Chapter Summary

The chapter four of this study dealt with the results and discussion for the objectives of the study. The chapter used the Bounds test to ascertain the existence of the long run relationship in the ARDL model. The chapter also found both short run and long run relationship between macroeconomic variables and stock market return with a speed of adjustment of 91%. The chapter also performed statistical diagnostics on both the short run and the long run model.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Introduction

This chapter outlined the summary, conclusion and recommendations for the study. The main conclusion deduced from the study is that there is a relationship among macroeconomic variables, control of corruption and stock market returns.

Summary

The main purpose of the study was to assess the relationship macroeconomic variables, control of corruption and stock market returns in Ghana. The specific objectives were to analyse the relationship between the macroeconomic variables and stock market returns and also examine the moderation effect of corruption on that relationship. Data was collected on stock market return, GDP, inflation, and money supply all from the International Monetary Fund, Ghana stock exchange and World Bank websites from 1996 to 2018. The motivation was due to recent expose of corruption scandal in the legal system (Anas, 2015) which has confirm high corruption in Ghana and the recent interest of empirical literature on the role of corruption in stock market (Boadi & Amegbe, 2017;Hooper, Sim, Uppal, 2009).Quantitative research method was employed as the approach and the explanatory research design was used. The data collected were analyzed using autoregressive distributed lag (ARDL) model and the bound test.

Summary of findings

The summary of this study was premised on the two major objectives of the study.

Short run relationship between macroeconomic variables and stock market return

In the short run relationship, the study found that inflation negatively influence stock market returns in Ghana. Money supply was found to have positive influence on stock returns. Gross Domestic Product was found to have no effect on stock market returns in the short run. In the short run when there is a deviation in the market from the equilibrium path, the market will converge to long run equilibrium at a speed of 91% per year.

Long run relationship macroeconomic variables and stock market return

In the long run, the study found stock market returns to be positively influenced by money supply and GDP while the effect of inflation still remained negative in the long run.

The moderating effect of corruption on the relationship between macroeconomic variables and stock market returns

The results show that on the overall, low levels of corruption will improve stock market performance or return and will also enhance a positive effect of the macroeconomic variables on stock market returns. Specifically, it will reduce the negative effect of inflation on stock market returns and will improve the positive effect of Money Supply and GDP on stock market returns.

Conclusion

The overall conclusion deduced from this study is that there is a long run and short run relationship between macroeconomic variables and stock market returns in Ghana. Based on the first hypothesis, the study concludes that there is a significant positive of macroeconomic variables on stock market movement in Ghana. Specifically, in both the long run and the short run, relation be money supply has a significant influence on stock market return while inflation negatively influence stock market return. In the long run, the study concludes that money supply and GDP has a positive effect on stock market returns while inflation had a significant negative effect on stock market returns. Based on the second hypothesis, the study concludes that there is significant positive moderating effect of control of corruption on the relationship between macroeconomic variables.

Recommendation

Based on the findings of the study, the study recommends that both current and potential investors should pay closely to the inflation, money supply and GDP dynamics before making investment on the Ghanaian Stock exchange.

Further, the study recommends to the government and the Central Bank of Ghana should enforce regulations and laws on corruption on the stock exchange and also to check the activities of black marketers in the economy. This will in part cause the macroeconomic variables to favorably effect stock market performance.

Suggestion for Future Study

Future studies could examine the moderating effect of pertinent governance variables like rule of law, political stability, regulatory quality and property rights on the relationship between macroeconomic variables and stock returns.

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