

Fiscal Policy, Monetary Policy and Stock Market Activity in Ghana

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DECLARATION

I hereby declare that this submission is my own work towards the CEMBA and that to the best of my knowledge, it contains no material published by another person nor materials which have been accepted for the award of any other degree of the university, except where due acknowledgement has been made in the text.

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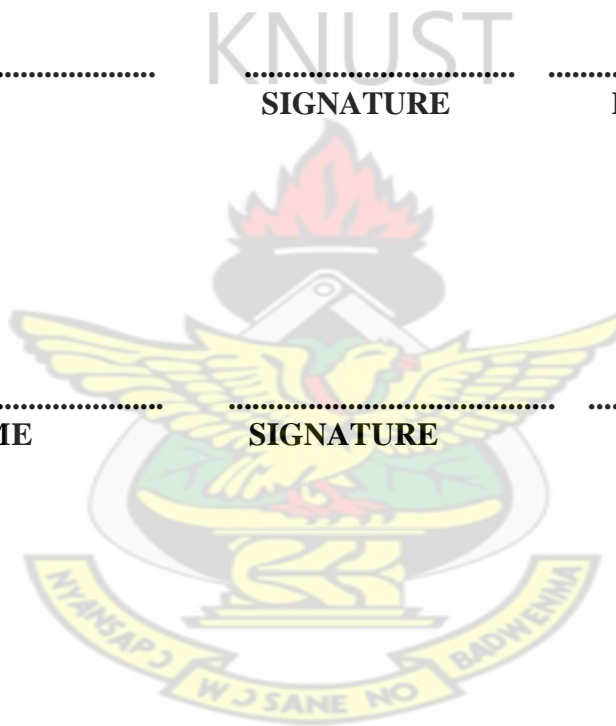
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DEDICATION

To my lovely wife and daughter Emefa and Delaena.

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First of all, I would like to thank my colleague and sister Edith Ama Agbeko. Without her, I am pretty sure I would not have been able to continue to this level. You really mean so much to me.

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I am fully responsible for all mistakes in this dissertation. If I have any success in the future, I dedicate it to all the people mentioned above. Finally, I made it.

ABSTRACT

The study examined the impact of fiscal and monetary policy actions on the stock market in Ghana. In pursuing this I probed the inter-temporal interaction between fiscal policy, monetary policy and stock market activities in Ghana and investigated the efficiency of the stock market with respect to fiscal and monetary policy information. The theoretical contention of the Keynesian Economics that a policy mix of fiscal and monetary policy is the best in achieving macroeconomic objectives informed the study.

Empirical evidence supported the proposition but its interaction with interest rate suggests that such policies may have concurrent effect on stock market activities. Stock market activity is either enhanced or disrupted as a result of changes in any of the policy effects.

It was found that, both from common correlation analysis to recent econometric modeling; indicate fiscal policy actions have significant effects on stock market activities and not the other way round. In addition, there is a unidirectional causal effect of fiscal policy actions on stock market activity. It was thus concluded that the fiscal policy actions do matter in the activities of stock market activities and, perhaps, becoming more important over time. Thus such actions should be incorporated in the pricing of securities in the market to eliminate all inefficiencies in the market and build investor confidence.

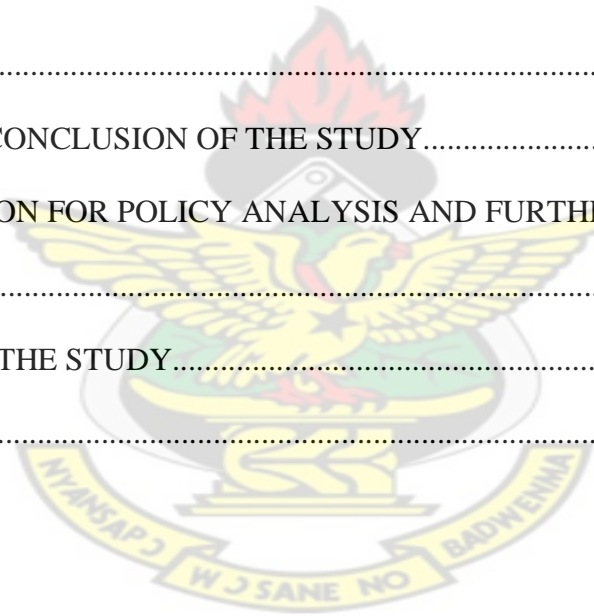
The study recommends that government must synchronizes its fiscal policy actions with activities in the stock market among other

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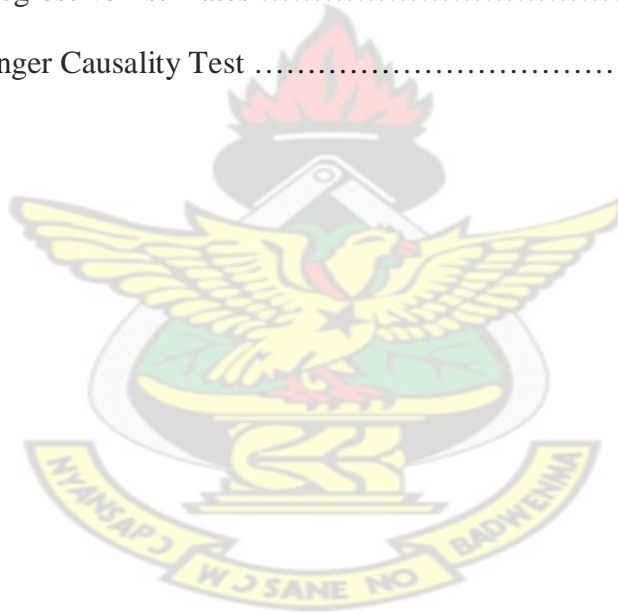
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CHAPTER ONE

INTRODUCTION

1.0 Background to the study

There is substantial theoretical evidence from the Keynesian paradigm that fiscal or monetary policy actions cannot be separately effective in achieving desirable macroeconomic objectives. Hence a policy mix, where some suitable level of fiscal policy is accompanied by another suitable level of monetary policy, is emphasized.

While there is equally irresistible empirical evidence about this Keynesian proposition, the inter- relations between fiscal and monetary policy actions and interest rates from the typical IS-LM framework suggest analysis of stock market activities cannot be completely independent of such policy influences. This is the case as changes in any of the fiscal or monetary policy instruments (like government spending, taxes and money supply) change market interest rates instantaneously in the framework and forces investors to revalue their equity holdings. In other words, the value of the wealth of investors (which includes equity holdings), given by the sum of the discounted future cash flows (and/or dividends), is affected by an easing or tightening fiscal or monetary policy either through the discount rate or expected earnings or both. Thus it may be more appropriate to examine the influences of all these policies concurrently when analyzing stock market activity.

Unfortunately, this has not been the case in the literature, at least for the developed world. Attempts at analyzing stock market activities considered fiscal policy actions (e.g., Rogalski and Vinso, 1977; Darrat, 1988; Darrat and Brocato, 1994; and Lee, 1997) separately from monetary policy actions (see, for instance, Bordo and Wheelock, 2004; and Laopodis, 2006) for obvious reasons (one being the underlying theoretical literature). Relatively few studies have attempted to combine both policies to examine how such policy actions interact intertemporally with stock market activities.

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The evidence is no different for developing countries. For instance, no study could be found for the case of Ghana, where an attempt is made to analyze stock market activities intertemporally with fiscal and monetary policy actions.

However, such a focus is crucial both from a theoretical and an empirical point of view. Theoretically fiscal policy actions (changes in expenditures or taxes resulting in budget deficits or surpluses) play a significant role in the determination of asset prices. Increases in taxes (with government spending remaining unchanged), for instance, lowers expected asset returns (or prices) as they discourage investors from (further) investing in the stock market. Also, increases in government borrowing raise the (short-term) interest rate which, in turn, lowers the discounted cash flow value from an asset (like a share) and thus signals a reduction in stock market activity (aside from other adverse effects in the general economy). In the latter case, higher interest rates threaten future economic activity, thereby forcing monetary authorities to reverse this

undesirable situation; leading to an interaction between fiscal and monetary policy. From an empirical point

of view also, a policy mix builds investor confidence and motivates investor decisions.

It is thus the purpose of this study to fill the gap in the empirical literature in Ghana by investigating the extent to which stock prices (or returns) incorporate all publicly available information on fiscal and monetary policy actions.

This was done by using quarterly time series data between 1991 and 2006 and employing a cointegration and causality test procedures on the above stated relation.

1.1 Statement of the Problem

The important role that stock markets play in the financial development of many countries basically has to do with the liquidity it affords investors given its competitive nature – an attractive feature of investing in stocks, compared to other less liquid investments such as real estate. Thus while rising share prices, for instance, tend to be associated with booming business investment activities, increases in the prices of shares also affect the wealth of households and their consumption; and ultimately growth.

Unfortunately, the nonexistence of an empirical intertemporal interaction between fiscal and monetary policy actions, and stock market activities present a challenge. First, this non-existence raise questions about certain theories that postulate the stock market to be relatively more

efficient to any other market and their other conclusions. Second, it provides relatively little evidence as to whether policy actions directed at liberalizing the financial market, and particularly the capital market, has achieved its desired objectives since there is no evidence to this effect. Lastly, it provides little basis for investor confidence in stock market activities. These intend have varied implications for the volatility and the risk of complete bankruptcy of securities on the stock market.

In Ghana, though a lot has been done to create an enabling environment for the successful operation of the stock exchange, addressing the issue of the intertemporal interaction between fiscal and monetary policy actions and stock market activities provide answers to the above challenges and fundamentally build investor confidence. It is thus the purpose of this study to investigate this issue.

1.2 Objectives of the Study

The general objective of the study is to examine the impact of fiscal and monetary policy actions on the stock market.

The specific objectives of the study include

1. To probe the intertemporal interaction between fiscal policy, monetary policy and stock market activities in Ghana
2. To investigate whether the stock market is efficient with respect to fiscal policy information.
3. To investigate whether the stock market is efficient with respect to monetary policy information

1.3 Research Questions

The study intends to answer the following research questions;

1. Is there an intertemporal relationship between fiscal policy, monetary policy and the stock market in Ghana?
2. Is the stock market efficient with regards to fiscal policy information?
3. Is stock market is efficient with regards to monetary policy information?

1.4 Justification of the Study

First, it would be interesting to find out whether the stock market offers an important channel for transmitting (the impact of) fiscal policy to the financial (and real) side of the economy. Second, if the stock market is not efficient with respect to fiscal policy information then private sector investor actions could profitably exploit the stock market, at least in the short-run. Finally, from the perspective of businesses, large budgetary deficits undercut investments in financial assets like stocks and bonds and real assets like plant and equipment by driving interest rates higher (that is, we have the so-called ‘crowding-out effect’) which, in turn, curtail economic growth.

1.5 Organization of the Study

The study is in five chapters. This current chapter discussed the background of the study, statement of the problem, objectives, research questions and the justification of the study. The second chapter dealt with the review of relevant literature: both theoretical and empirical. Chapter three discussed the research methodology. Chapter four dealt with the analysis of the study and the last chapter (chapter five) discussed the conclusions and recommendation of this study.

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CHAPTER TWO

REVIEW OF RELEVANT LITERATURE

2.0 INTRODUCTION

This section explores the literature on fiscal and monetary policy and stock market activities. This was done in three sections, with each addressing the respective substantial issues. The first section explores the theoretical literature on fiscal policy and stock market activity. This is followed by a review of literature on monetary policy and the stock market. Finally, an empirical literature review and concluding remarks was provided. The literature review served as the basis for which the methodology of the study will be formulated and also provide the framework for the analysis of results.

2.1 THEORETICAL LITERATURE

2.1.1 Fiscal Policy and Stock market Activity

The issue about whether government fiscal deficits have any effect on stock market activity has been a topical issue among financial economists. While some argued that fiscal policy actions have no effect on stock market activity due to the efficiency of stock markets, others disagree, and insisted that fiscal deficits may affect stock market activity through changes in the rate of interest which triggers a portfolio revaluation by investors. The former view is referred to as the Ricardian equivalence proposition attributed to Barro (1974). The Ricardian proposition states that rational individuals anticipate future tax liabilities, implied by current and expected deficits, and thus fully discount them currently. Therefore, investors would not readjust their portfolios since they are aware that any future government debt would be financed by future increases in taxation. Thus, deficits do not matter if individuals correctly expect and discount future tax increases from current tax decreases thus leaving their net worth unaffected. The Ricardian equivalence view is supported by stock market efficiency (SME) hypothesis. In its semi strong

form, the SME hypothesis contends that stock prices fully reflect all publicly available information (Fama, 1970; 1991; Davidson and Froyen, 1982).

Contrary to the Ricardian equivalence proposition and SME argument, Tobin (1969) and Blanchard (1981) among others found that fiscal policy actions do matter in relation to the stock market. In his general equilibrium approach, Tobin (1969) asserted that stock returns serves as a linkage between the real and the financial sectors of the economy and depicted how both budget deficits and money growth could have important effects on stock returns. At the theoretical level, fiscal policy actions such as changes in government expenditure or taxes (resulting in budget deficits or surpluses) are important determinant of asset prices. For instance, increases in taxes with government expenditure unchanged would lower asset returns (or prices) due to the fact that such a policy action may discourage investors from further investing in the stock market (Laopodis, 2008). Moreover, government fiscal policy in relation to capital gains tax has some implication for the stock market. Investors will only pay capital gains taxes as they offload their shares to other prospective investors. Thus high capital gain taxes may discourage investors from actively trading their shares which may dampen the liquidity of the stock market.

Besides increases in government borrowing would lead to a rise in the short term interest rates, which in turn lower the discounted cash flow value from an asset. This may culminate in a decline in stock market activity due to lower expected returns. However, with respect to high interest rate, which threatens to crowd out the private sector culminating in a decline in investment and economic activity, the central bank may take action by increasing the money supply.

Moreover, Blanchard (1981) argues that fiscal policy may be motivated by other economic and political considerations. Thus, certain fiscal policy measures may be unanticipated by economic agents and therefore can be described as a fiscal policy shocks which may affect stock market returns. Even when fiscal policy action is anticipated by economic agents, it may still have some effect on stock market activity due to lags in policy. Two main lags, the decision lag and the implementation lag may account for this development. The decision lags, refers to the time it takes policy makers to effect a change in policy in response to shocks while implementation lags constitute the time it takes for policy changes to be implemented.

2.1.2 Monetary Policy and Stock Market Activity

There is some disagreement among financial economists on the neutrality of monetary policy on the stock market. Proponents of the efficient market approach believes that all past information incorporated in the money supply data is reflected in current stock returns and so money supply changes should have no impact on stock returns (except, perhaps, a contemporaneous effect (Cooper, 1974; and Rozeff, 1974)

On their part, Boudoukh, Richardson, and Whitelaw (1994) asserted that whether monetary policy affects the real economy, and whether its effects are quantitatively important, is an empirical question.

The second perspective suggests that investors attempt to hold an equilibrium position among all assets, including money and equities. An exogenous shock that increases the money supply would temporarily disturb this equilibrium until investors substitute money for other assets

(including stocks). So, equities respond to monetary disturbance with a lag (and that lag could, theoretically, be linked to an interest-rate effect, a corporate-earnings effect, a risk-premium effect (see Hamburger and Kochin, 1971,))

In economic literature, the effect of monetary policy on stock market returns is analyzed from two main channels, namely through the money supply or the interest rate (prime rate). A change in the money supply for example may lead to changes in market interest rates which would trigger a portfolio readjustment by investors. This may be explained by the fact that, changes in the market interest rate affects the value of wealth – the sum discounted future cash flows (and /or dividends) – thereby compelling investors to revalue their equity holdings. Thus, monetary policy may impact on stock market activity through valuation of physical assets relative to their replacement cost (Tobin, 1969).

2.2 EMPIRICAL LITERATURE

There is an overwhelming empirical literature on the issue of monetary policy and stock market behavior for advanced economies. For developing countries research on the issue has been sparse, but has been rising in recent times.

In his seminal work entitled, “A General Equilibrium Approach To Monetary Theory” Tobin (1969) emphasized stock returns as an important link between the real and financial sides of the economy. In that model, Tobin depicted how stock returns may respond to changes in the monetary and fiscal policy variables of the model.

Rozeff (1974) tested the efficient market hypothesis against what he termed the “predictive monetary portfolio model”. Developed by Bruner (1961), Friedman (1961) and Friedman and Schwartz (1963), among others, the monetary portfolio model views money as any other asset in the portfolio of investors. Monetary policy shocks will then trigger substitution money and other assets in an attempt to restore their desired money holdings. But it is important to know that investors will respond with a lag, which would imply that money could help predict stock market returns. The findings from Rozeff’s (1994) study showed that lagged money supply do not predict future movements in stock prices. However Rozeff argued that, publication lag must be accounted for to find out precisely the particular time that the money supply information is made available to investors. On the contrary his findings lend credence to the fact that stock returns are related to contemporaneous and future changes in the money supply.

Rogaslki and Vinso (1997) improved Rozeff’s (1974) study by synchronizing the money supply data and ensured that money supply data is generated at the same interval as stock return data by accounting for autocorrelation. The findings from their study indicated that there is a unilateral causality running from stock prices to money supply but not the other way round.

Blanchard (1981) analyzed the interaction of output and policy actions on the stock market. He argued that the effect of a change either in current or anticipated policy is a discrete change in the stock market due to the change in the anticipated sequence of profits and real interest rates. According to him, the stock market is not the "cause" of the increase in output, no more than the increase in output is the cause of the initial stock market change. They are both the results of changes in policy. Blanchard (1981) further argued that whether policies are anticipated or not is important; the announcement itself will usually lead to a change in anticipated profits and

discount rates, leading to a change in the stock market. Under plausible assumptions, the announcement of an expansionary fiscal policy may have a perverse effect, decreasing output before the actual implementation of the policy.

Friedman's study 1988 also provided great insight into the effect of money on stock market returns. Although, Friedman's study was basically on money demand rather than supply, the evidence provided is important because in estimating the money demand function the basic assumption is that money supply equals money demand at equilibrium. Thus the money stock is employed in studies involving estimating either the money supply or money demand function. Friedman's (1988) study was motivated by a chart prepared by a financial institution showing a strong inverse relation between the level of the Dow Jones stock market index and the velocity of the monetary aggregate (M2). Friedman (1988) revealed that the real quantity of money demand relative to income is positively related to variation in stock prices, but negatively related to the contemporaneous stock market returns.

According to Friedman, the inverse relation between equity prices and velocity can be explained as; a wealth effect, a risk spreading effect, and a transaction effect. A rise in equity prices results in increased nominal wealth, which in turn leads to a higher wealth to income ratio, culminating in higher money to income ratio. Secondly, higher equity prices and higher expected equity excess returns on equity could reflect higher risk. Investors in an attempt to diversify their portfolio would reduce equity holdings in favour of lower risk assets, which include money. Finally, higher equity prices would imply a higher dollar volume of transactions which requires increased money balances to finance these transactions.

Bernanke and Blinder (1992) explore the effect of monetary policy actions on stock market activity by employing the VAR approach, and the federal funds rate as measure of monetary policy. Evidence from variance decompositions and Granger causality tests indicate that the funds rate forecasts unemployment, industrial production, and other real variables well over the period 1959 – 1989. This is consistent with the hypothesis that monetary policy exerts an important effect on real variables and consequently impacting on stock market returns.

Darrat (1998) investigated the validity of the SME hypothesis that current stock returns fully incorporate all past policy actions for Canada. Using quarterly data for the period 1960-1984, and utilizing Ordinary Least Squares (OLS) regression, Darrat (1998) found that past monetary policy actions have an insignificant effect on current stock prices in Canada - evidence of stock market efficiency. However, the results further indicated that changes in fiscal policy stance play an important role in determining stock market returns, even when the interest rate path is excluded from the model. Darrat (1998) revealed that after controlling for the effects of fiscal policy on the required return to capital, the empirical results indicate the presence of a significant lagged relationship between fiscal measure and current stock prices. A further test suggest that fiscal policy actions anticipated from an ex ante equation have significant lagged effects on current stock returns in addition to those of required returns. The findings of Darrat (1998) therefore do not support stock market efficiency hypothesis with respect to available information on fiscal policy. The findings implies that, a cautious fundamental analysis of Canadian fiscal policy could potentially increase the returns of a diligent investor, although the prospects of

earning abnormal returns may fade out as increasing number of investors begin to utilize available fiscal policy information.

Laopodis (2008), examined the dynamic linkages among the federal budget deficit, monetary policy and the stock market for the 1960 to 2004. The findings from the study indicated that deficits matter for the stock market, contrary to the Ricardian equivalence proposition. Further analyses using taxes and government spending confirmed a higher sensitivity of the stock market to taxes relative to spending. When market returns is replaced with before- and after-tax corporate profits and excess market returns, several economically significant results were reported. The study lend credence to the fact that unexpected increases in the fed funds rate lower expected stock returns leading to lower corporate profits and, thus, ultimately lower corporate tax revenues. Besides, explicit modelling of inflation along with the deficit, fed funds rate and stock prices indicated a negative response of the stock market to innovations in inflation which suggest that the stock market assimilates inflation information before pricing assets. However, the study could not support the hypothesis that monetary policy actions affect stock market activity, thus confirming the stock market efficiency hypothesis.

2.3 CONCLUSION

The chapter explored the theoretical underpinning and empirical literature on the dynamic interaction between fiscal policy, monetary policy and the stock market with the aim of providing the framework for the methodology and the analysis of results. In the first section, the theoretical literature on the various schools of thought concerning fiscal policy effects on stock market activity is analyzed. Proponents of the stock market hypothesis argued that fiscal policy

actions have no effect whatsoever on stock market activity since economic agents fully incorporate all publicly available information including fiscal policy information in their decision making. On the other hand, some economists disagree and insisted that fiscal deficits may affect stock market activity through changes in the rate of interest which triggers a portfolio revaluation by investors.

Like the effect of fiscal policy actions on the stock market, those who believe in the efficient market approach, asserted that all past information incorporated in the money supply data is reflected in current stock returns and so money supply changes should have no impact on stock returns. Critics of the SME approach suggested that investors attempt to hold an equilibrium position among all assets, including money and equities, as such exogenous shocks that increase the money supply would temporarily disturb this equilibrium until investors substitute money for other assets, including equities.

The empirical literature on fiscal and monetary policy actions on the stock market has been mixed. While some found evidence of significant impact of both policies on stock market returns, others confirm the SME hypothesis. Therefore whether fiscal and monetary policy actions have any effect on stock market activity is fundamentally an empirical question.

CHAPTER THREE

OVERVIEW OF THE CAPITAL MARKET IN GHANA

3.1 Summary of Capital Market Developments in Ghana

The Ghana Stock Exchange is considered the nucleus of Ghana's capital market. The exchange has become a vehicle for mobilizing long-term capital for economic development and has provided the platform for companies and investors around the globe to meet their financial and investment needs. The GSE symbolizes Ghana's commitment to provide an enabling environment for private sector growth (Ghana Stock Exchange, 2000)¹. Besides, the GSE has provided the platform for integrating the national economy into the global economy. Unlike the equity market which is quite developed, the bond market is in its embryonic state. However, some analysts believe that the oversubscription of Ghana's first international bond in 2007 is an indication of the confidence investors have in the Ghanaian economy which would be translated into increased inflow of investment.

¹ Adopted from 10th Anniversary brochure of the Ghana Stock Exchange

The capital market in Ghana in the early 1990s can be described as underdeveloped when analyzed in terms of instruments traded and the spectrum of investors. This assertion was supported by Yartey's (2006) study, which showed that the stock market performed poorly for the four years of operations. However, in the mid 1990s, stock market performance improved tremendously. For instance, one important indicator of stock market development, stock market capitalization in proportion to GDP reached a record peak of 35 percent which is close to the world average of 38.2 percent.

3.2 Historical Background – The Ghana Stock Exchange

Several attempts have been made since late 1960s under different governments to establish a stock market for the country, but never materialized. In 1968, a report by Commonwealth Development Finance Company recommended the establishment of a stock exchange in Ghana within ten years and suggested ways of achieving it. To this respect a rudimentary market, the Accra Stock Exchange Company was incorporated in 1971 but experienced a false start (Ghana Stock Exchange, 2000).²

However, in 1989, the idea of setting up a stock exchange received special attention from government when a ten member committee under the chairmanship of Dr. G.K. Agama, the then Governor of the Bank of Ghana was set up. The work of the committee was to consolidate all previous work connected to the stock exchange project and work out modalities towards the actual establishment of the exchange. In July 1989, the Ghana Stock Exchange was incorporated as a company limited by guarantee under the companies' code, 1963. The council of the exchange was inaugurated on November 12, 1990 and trading commenced on the floor of the

² See Ghana Stock Exchange 10th Anniversary Brochure.

exchange the same day with 11 listed companies. In April 1994, a resolution was passed at the annual general meeting (AGM) to alter regulations of the exchange as a private company limited by guarantee to that of a public company limited by guarantee under the companies code 1963(Act 179).

3.3 Objectives of the Ghana Stock Exchange³

The exchange was established to:

1. provide facilities to the public of Ghana for the purchase and sale of bonds, stocks, shares and other securities of every kind and for the investment of money;
2. control the granting of quotations on the securities market in respect of bonds, shares, and other securities of any commodity, corporation, government, municipality, local authority or other body corporate;
3. regulate the dealings of members with their clients and with other members;
4. coordinate the stock dealing activities of members and facilitate the exchange of information for their mutual advantage and for the benefit of their clients and to offer facilities whereby the public can be informed of the prices of securities dealt in by members and;
5. cooperate with the associations of stockbrokers and stock exchanges in other countries, and to obtain and make available to members information and facilities likely to be useful to them or to other clients. (See Ghana stock Exchange 10th anniversary brochure).

3.4. The Legal and Regulatory Framework

³ Extracted from Ghana Stock Exchange 10th Anniversary Brochure

The bedrock of an efficient stock exchange is the enforcement of rules and regulation governing its operation. Investor confidence in the stock market hinges largely on the framework of laws and regulations. The securities industry law (SIL), (PNDCL 333) 1993 is the main legal framework that regulates the securities market in Ghana. Under the securities industry law, the apex regulatory body for the securities market is the Securities and Exchange Commission (SEC). The functions of SEC includes maintaining surveillance over securities business to ensure orderly, fair, and equitable dealings in security registering, authorizing and regulating the stock exchange, investment advisors, securities dealing etc; and protecting the integrity of the securities market against any abuse arising from the practice of insider trading. The GSE operates within a set of rules, including membership, listing, trading, clearing & settlement and depository. These are collectively referred to as the GSE rule book.

Membership Rules

These state the criteria for membership of the GSE, code of conduct for members, among others. Members of the GSE are classified into three main categories namely licensed dealing members, associate members and government securities dealers (PDs). Licensed dealing members deals in all securities and are usually corporate bodies licensed by the exchange. Associate members by comparison are individuals or corporate bodies which have satisfied the exchange's membership requirements but are not licensed to deal in securities. PDs are corporate bodies approved by the Bank of Ghana and registered by the exchange to deal only in government securities.

Listing Rules

The Ghana Stock Exchange listing regulation 1990 (LI 1509) provides the framework for regulating transactions on the exchange. The listing regulations prescribe among others; criteria for listing securities, application procedure, content application and prospectus and continues obligation of the listed companies.

Trading and Settlement Rules

These rules govern the floor trading procedures and settlement issues on the exchange. It entails the adoption of a continuous auction system of trading as well as order of trading, clear guidelines about bidding procedure and responsibilities of authorized dealing officers directed towards the prohibition of fraudulent transactions.

Market Index⁴

The GSE all-share index is set up to provide a composite measure of the stock market for the benefit of investors as well as all market operators who are concerned with general price movements. It consists of equity shares listed on the Ghana Stock Exchange. It is basically a measurement of changes in the average capitalization of the listed shares, which is adjusted to eliminate the effects of capitalization changes, new listings and delistings. The market capitalization of each equity is obtained by multiplying its price by the number of shares listed. The aggregate market capitalization which is the sum of the total individual market capitalization is then expressed as a relative of the base period market capitalization⁵.

3.5 Market Performance and Major Developments

The GSE had witnessed increased market activities in its primary and secondary markets.

⁴ See GSE Factbook, 2000

⁵ The base market Capitalization of the GSE all share index is the average market capitalization of all listed equities between 1990 and 1993.

3.5.1 Primary Market Activities

During the first ten years of its operations, the GSE recorded a total of GH¢ 23.35 million and \$11 million through various primary market activities such as initial public offering (IPO), right issue and bond issue. The table below presents detailed primary market activities for the period 1990-2000.

Table 3.1 Summary of primary market activities, Equities (1990-2000)

| Company | Description | offer Period | Amount raised (GH¢) |
|------------------------------|--------------|-----------------------|---------------------|
| Super Paper Products Co. ltd | IPO | Dec. 1991-Feb. 1992 | 63,000 |
| Mechanical Lloyd Co. Ltd | IPO | Dec. 1993-Feb.1994 | 46,816 |
| Ashanti Goldfields Co. Ltd | IPO | March-April, 1994 | 5,984,000 |
| Ashanti Goldfields Co. Ltd | IPO | May-June, 1994 | 281,510 |
| Home Finance Co. Ltd | Placement | Jan. 1995 | 131,245 |
| Pioneer Aluminium Co. ltd | IPO | May-July, 1995 | 76,270 |
| SSB Bank Limited | IPO | Sept.- Oct. 1995 | 1,202,095 |
| Accra Brewery Ltd | Rights Issue | June- August, 1992 | 144,000 |
| Aluworks company Ltd | Placement | Sept.- Nov, 1996 | 330,750 |
| UTC Estates Ghana Ltd | OFS | Oct. 1994-Mar.1995 | 240,000 |
| PZ Ghana Ltd | Rights Issue | Sept.-Oct., 1995 | 960,000 |
| Ghana Commercail Bank Ltd | IPO | Feb.-March, 1996 | 3,421,924 |
| Guiness Ghana Ltd | Rights Issue | May-June, 1996 | 493,400 |
| Mechanical Lloyd Co. Ltd | Rights Issue | Oct.-Nov., 1997 | 199,048 |
| Home Finance Co. Ltd | Rights Issue | Oct.-Nov., 1998 | 570,059 |
| Accra Brewery Ltd | Rights Issue | November, 1998 | 994,467 |
| Metalloplastica Ghana Ltd | Rights Issue | Jan.18 -Feb. 19, 1999 | 216,000 |
| Camelot Ghana Ltd | IPO | August 9-20, 1999 | 70,000 |
| Produce Buying Co. Ltd | IPO | Dec.1999-Mar.2000 | 5,919,000 |
| Accra Brewery Ltd | Rights Issue | Dec., 2000 | 2,011,203 |
| Total | | | 23,354,787 |

Source: Ghana Stock Exchange factbook, various issues

In the bonds market, a number of primary market activities were undertaken during the period. The GSE commemorative registered stock, 1995 was issued by the Government of Ghana in 1990 amounting to GH¢ 0.5 million. Apart from the government, the Home Finance Company Ltd issued a series of bonds between the periods 1996 to 2000 valued at GH\$11.

3.5.2 Secondary Market Activities

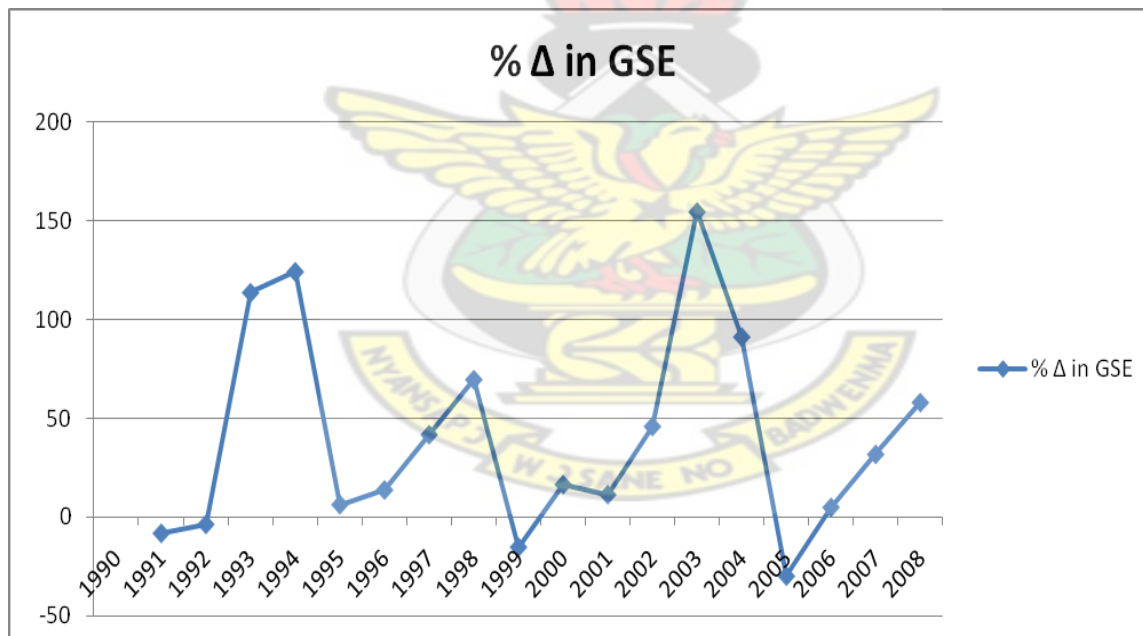
The secondary market is the market in which shareholders can resell their shares to other interested buyers on the stock exchange or in the over-the-counter market.

GSE All-Share Index

For almost two decade of operations, the performance of the Ghana stock exchange can generally be described as impressive. With an end of period index of 70.25 points in December 1990, the GSE all-share index rose to 857.98 points by the end of December 2000. During the first ten years the market also peaked at an all-time high of 1201.19 points on May 6, 1998. The exchange however experience poor results during the first three years of operation. From 70.25 points in 1990, the index fell two conservative times in 1991 and 1992 with an index of 64.17 points and 62.17 points representing a loss of -8.17% and -3.63% respectively. The poor performance during the early years of operation was attributed to inadequate public awareness of the activities of the exchange. However, since 1993 the performance of the exchange has been remarkable. In 1994, the market recorded a gain of 124% making the exchange one of the best performing markets in Africa and the world as a whole. In 1998, the market realized a gain of 69.7% and was voted again as one of the best performing exchange on the continent (Ghana stock exchange, 2000).

The exchange continues its impressive performance under the second decade starting from the year 2000 up to the current period. During this period, there was increased volume of trading and continuous rise in market capitalization. The performance of the market in 2003 has been the best so far in the history of the exchange. A record year-to-date gain of 154.67% was achieved by the end of December 2003. The GSE All-share index ended the year with 3553.42 points compared with 1395.31 in 2002. Apart from the year 2005 where the market recorded its lowest performance of -29.85%, all the years have recorded moderate gains starting from 2000 up to 2008.

Figure 1: Percentage change in the GSE All-share Index (1990-2008)



Source: Ghana Stock Exchange factbook, various issues

Market Capitalization

Market capitalization for the period under review has been on a rising trend. From a minute value of GH¢ 3.05 million in 1990, market capitalization rose to GH¢ 365.50 million in 2000

and later at GH¢17,895.10 million in 2008. During the first decade, market capitalization hits a record of GH¢ 196.84 million in 1994 compared to the previous year's figure of just GH¢ 9.65 million representing 1939.6% increase. The sudden jump in the figure is caused by the listing of Ashanti Goldfields Company on the GSE in March 1994. Moreover, there was a significant increase in the capitalization figure from GH¢ 1,261.66 million in 2003 to GH¢ 9,761.48 million in 2004.

Table 3.5 Summary of Secondary Market Activities (1990-2008)

| Period | Volume Traded (million) | Value Traded (GH¢ m) | Market Capitalization (GH¢ m) | GSE All-Share Index | |
|--------|-------------------------|----------------------|-------------------------------|---------------------|----------|
| | | | | End of Year | % change |
| 1990 | 0.22 | 0.006 | 3.046 | 70.25 | - |
| 1991 | 1.83 | 0.01 | 2.962 | 64.51 | -8.17 |
| 1992 | 2.04 | 0.017 | 4.375 | 62.17 | -3.63 |
| 1993 | 37.95 | 0.318 | 9.651 | 132.88 | 113.74 |
| 1994 | 93.04 | 7.309 | 196.843 | 298.1 | 124.34 |
| 1995 | 55.84 | 2.709 | 239.902 | 316.97 | 6.33 |
| 1996 | 35.75 | 2.788 | 286.272 | 360.76 | 13.82 |
| 1997 | 125.63 | 9.335 | 255.278 | 511.74 | 41.85 |
| 1998 | 91.45 | 13.501 | 324.561 | 868.35 | 69.69 |
| 1999 | 49.57 | 6.961 | 320.539 | 736.16 | -15.22 |
| 2000 | 30.72 | 5.062 | 365.504 | 857.98 | 16.55 |
| 2001 | 55.3 | 9.228 | 390.403 | 955.95 | 11.42 |
| 2002 | 44.12 | 8.941 | 618.384 | 1395.31 | 45.96 |
| 2003 | 96.33 | 38.93 | 1,261.66 | 3553.42 | 154.67 |
| 2004 | 104.35 | 65.59 | 9,761.48 | 6798.59 | 91.33 |
| 2005 | 81.4 | 46.436 | 9,185.73 | 4769.02 | -29.85 |
| 2006 | 98.29 | 47.599 | 11,249.61 | 5006.02 | 4.97 |
| 2007 | 287.2 | 140.7 | 12,368.60 | 6,599.80 | 31.84 |
| 2008 | 545.8 | 380.4 | 17,895.10 | 10,434.28 | 58.10 |
| | | | | | |

Source: Ghana Stock Exchange factbook, various issues

Turnover

The volume traded is a measure of liquidity of the stock market because it indicates how investors can easily sell shares that they do not wish to hold. During the early years of operation the volume traded was shallow but rose sharply in the late 1990s. With volume traded just 0.22 million valued at GH¢ 0.006 million in 1990, it increased to 125.63 million amounting to GH¢ 9.34 million in 1997. The volume further increase to 247.2 million and 545.8 million valued at GH¢140.7 million and GH¢ 380.4 million in 2007 and 2008 respectively.

Market Capitalization as a Percentage of GDP

In most developed economies with well functioning financial market, stock market growth captured by market capitalization can be used to measure the performance of the economy as a whole. Despite the fact that market capitalization is an asset concept whilst GDP is a revenue concept, there is a fairly predictable relationship between total revenue and total assets. Research conducted over the years indicated that stock market capitalization roughly tracks growth in Gross Domestic Product.

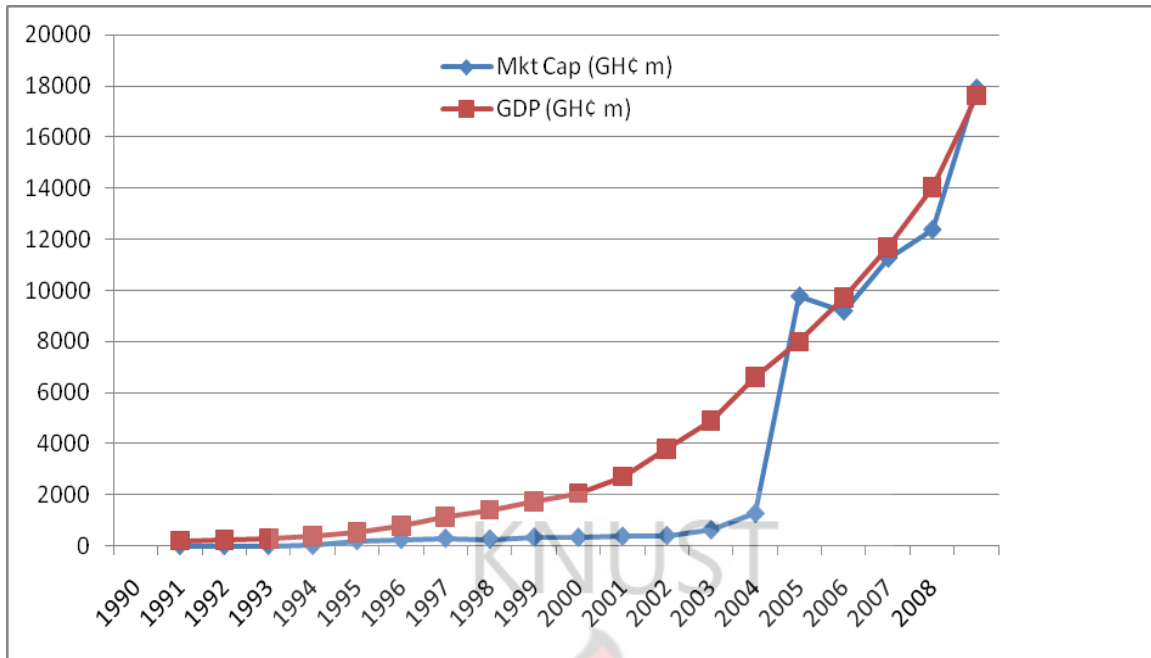
The market capitalization relative to the Gross Domestic product (MC/GDP) in Ghana has been on an upward trend. Starting with a minute value of 1.5% of GDP, the market capitalization-GDP ratio rose substantially to 37.8% in 1994 and achieved an all-time high of 122.2% in 2004. From Figure 3.2, between the period 1990-2003 market capitalization growth was abysmal relative to GDP growth. This is due the underdeveloped nature of the Ghana stock exchange as reflected in the spectrum of investors and companies listed.

Table 3.6 Market Capitalization and Gross Domestic Product (GDP)

| Period | Market Capitalization (GH¢ m) | GDP (GH¢ m) | MC/GDP (%) |
|--------|-------------------------------|-------------|------------|
| 1990 | 3.046 | 203.17 | 1.50 |
| 1991 | 2.962 | 242.75 | 1.22 |
| 1992 | 4.375 | 280.29 | 1.56 |
| 1993 | 9.651 | 387.25 | 2.49 |
| 1994 | 196.843 | 520.52 | 37.82 |
| 1995 | 239.902 | 775.26 | 30.94 |
| 1996 | 286.272 | 1,133.92 | 25.25 |
| 1997 | 255.278 | 1,411.34 | 18.09 |
| 1998 | 324.561 | 1,729.58 | 18.77 |
| 1999 | 320.539 | 2,057.91 | 15.58 |
| 2000 | 365.504 | 2,715.27 | 13.46 |
| 2001 | 390.403 | 3,807.07 | 10.25 |
| 2002 | 618.384 | 4,886.24 | 12.66 |
| 2003 | 1,261.66 | 6,615.77 | 19.07 |
| 2004 | 9,761.48 | 7,988.74 | 122.19 |
| 2005 | 9,185.73 | 9,726.06 | 94.44 |
| 2006 | 11,249.61 | 11,672.00 | 96.38 |
| 2007 | 12,368.60 | 14,045.80 | 88.06 |
| 2008 | 17,895.10 | 17,617.60 | 101.58 |

Source: Data from Ghana Stock Exchange and Bank of Ghana

However market capitalization rose sharply in 2004 and remain at high levels ever since. The GSE has become an attractive investment platform for many foreign investors from around the world.



Source: Data from Ghana Stock Exchange and Bank of Ghana

Figure 3.2: Trends in Market capitalization and GDP growth

Admittedly, though the trend in stock market capitalization and GDP growth was weak from the early 1990s to early 2000s, the relationship was somewhat stronger for the period 2004-2008.

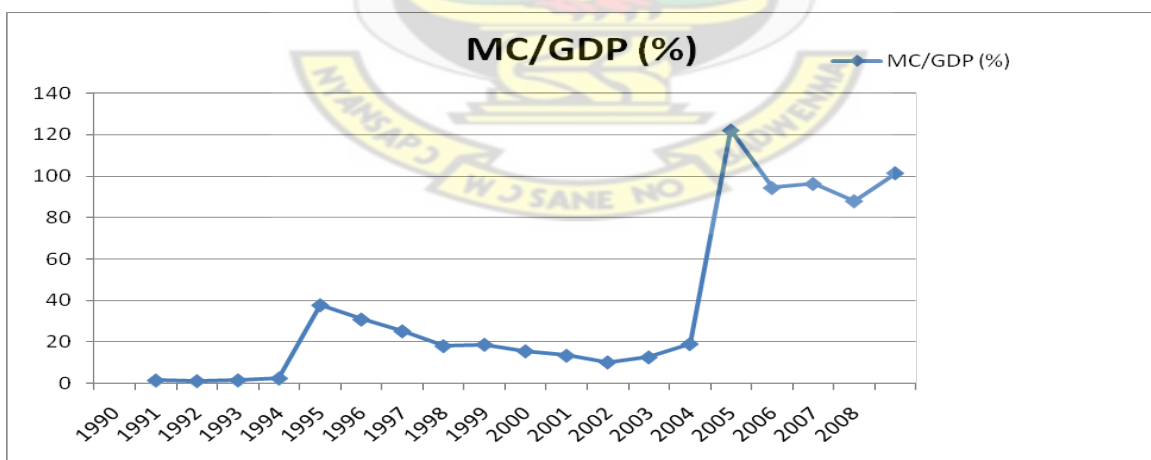


Figure 3.3: Trends in market capitalization as a percentage of GDP

Source: Data from Ghana Stock Exchange and Bank of Ghana

CHAPTER FOUR

METHODOLOGY

4.0 INTRODUCTION

This chapter presents the methodology of the study. This aids the presentation of results in the next chapter and the provision of appropriate policy recommendations in the last chapter. It begins with a description of the econometric model adopted for the study and the technique to be employed in estimating it. Later, the definitions of the various variables, their significance and their sources will be delved into. Finally, concluding remarks will be provided.

4.1 THE ECONOMETRIC MODEL

4.1.1 The Theoretical Framework

The discussion so far emphasized an inter-relation between fiscal and monetary policy actions and stock market activities through interest rates. The argument is that fiscal or monetary policy instruments (like government spending, taxes, money supply and interest rates) change market interest rates instantaneously and forces investors to revalue their equity holdings. In other words, the value of the wealth of investors (which includes equity holdings), given by the sum of the discounted future cash flows (and/or dividends), is affected by an easing or tightening fiscal or monetary policy either through the discount rate or expected earnings or both. Thus fiscal and monetary policy actions concurrently influence stock market activities.

This concern suggests one may have to employ a dynamic econometric model to examine the intertemporal interaction between fiscal policy, monetary policy and stock market activities.

Verbeek (2004) mentions that using a dynamic econometric model facilitates the investigation of dynamic interactions between variables in a special way that avoids the potential problems of spurious (nonsense) regression – a regression that produces a fairly high coefficient of determination, high auto-correlated residuals and highly significant coefficient estimates.

Following Laopodis (2008), the inter-relation between fiscal policy, monetary policy and stock market activities in Ghana is examined by using the following indicators respectively: General Government final Consumption expenditure (as a % of GDP), the average lending rate and the GSE all share index (with the rate of inflation and the excess return on the stock market as control variables). This is specified functionally as:

$$GSE = f(GOV, LR) \quad (1)$$

Where *GSE* is the Ghana Stock Exchange (measuring stock market activities), *GOV* is general Government final (measuring fiscal policy) and *LR* is the average Lending Interest Rate (measuring monetary policy). Taking logarithms of both sides of the equation, we have the following;

To estimate the above model, the study makes use of the Cointegration Technique due Johansen and Juselius (1990). The technique is essentially a maximum likelihood estimation procedure that allows one to test both for the short and long run relationship between variables. The starting point of the technique is the generation of a Vector Autoregressive Representation (VAR) of variables under consideration at a particular order and testing a hypothesis about the rank of a

generated cointegrating equation. Various tests can be conducted to determine the optimal lag lengths and the number of cointegrating equation of the series under consideration. Later a parsimonious equation (representing the short run relationship of variables under investigation) could be estimated. Although Johansen's methodology is typically used in a setting where all variables in the system are $I(1)$, having stationary variables in the system is theoretically not an issue and Johansen (1995) states that there is little need to pre-test the variables in the system to establish their order of integration. If a single variable is $I(0)$ instead of $I(1)$, this will reveal itself through a cointegrating vector whose space is spanned by the only stationary variable in a model.

To complement the above estimation, the Granger Causality test is implemented between the variables under investigation. Granger causality measures whether one thing happens before another thing and helps predict it - and nothing else. Thus if, for instance, one is measuring the causal link between X and Y , and X is established to be causing Y , then, changes in X happens first then followed by changes in Y . Hence, two conditions must be satisfied in this case: (1) X can help in predicting Y and the regression of X on Y has a big coefficient of determination. (2) Y cannot help in predicting X . The Granger causality test is preceded by the specification of a vector autoregressive model (VAR), where the appropriate lags, stability of the model and its specification must be satisfied. After this the causality test can be concluded.

4.2 The Econometric Technique

4.2.1 Stationarity Test

Studies involving time series analysis necessarily employ data from the past to quantify historical relationships, such that if the future happens to be like the past, then the historical

relationship can be used to forecast the future. But if the future happens to be essentially different from the past, then those historical relationships may not be reliable in forecasting the future. Hence it is fundamental that time series variables follow at least a stochastic process and are stationary. For the purposes of this study, the Augmented Dickey-fuller (ADF) test was employed to ascertain if the variables under consideration are stationary or not (have a unit root). Where the variables are found to contain unit roots, the study makes use of the logs followed by the respective number of differences of the variables, until the variable in question becomes stationary.

4.2.2 Testing for Lag Structure

One of the challenges in specifying an optimal lag length (ρ) for a model is that if its chosen lag length is too small, it is possible the model may be mis-specified due to the omission of relevant variables and if too large, it is possible the number of degrees of freedom may be lost. In other words, a model with relatively large number of lags is most likely to produce residuals that approach the white noise process, but might not be parsimonious. On the other hand, a model with smaller lag lengths is more likely to be parsimonious, but might not produce residuals that are random enough to approach a white noise process. The above problem implies that there is the need to select an optimal lag length ρ . The Schwartz Bayesian information Criteria (SIC) and the Akaike information Criteria (AIC) are identified in literature as appropriate in selecting optimal lag lengths that produces errors that approach a white noise process, subject to the constraint that the smallest number of lag terms was selected for parsimony. These approaches will jointly be employed to determine the optimal lag length of variables for this study.

4.2.3 Diagnostic Tests

As Kramer et al. (1985) recommends, conventional regression output needs to be supplemented by a number of specification tests. A series of tests are performed to support this study. These include testing the residuals for normality, homoscedasticity, and autocorrelation. Also, a test was carried out on coefficient in various models for their significance. Lastly, models were taken through the Ramsey's Reset test, Normality test and Stability tests for parsimony.

4.3 Measurement of Variables and their expected signs

4.3.1 The Ghana Stock Exchange (GSE) All-Share Index

The GSE All-Share index is the principal stock index for the Ghanaian Stock Exchange. This index is calculated from the values of each of the market's listings and measures the performance of portfolios in the market. Effective 4th January, 2011, the GSE has introduced a new method of calculating closing prices of equities on the market. The closing prices of listed equities are calculated using the volume weighted average price of each equity for every given trading day. There are two indexes: the GSE Composite Index (GSE-CI) and the GSE Financial Stocks Index (GSE-FSI).

GSE Composite Index (GSE-CI): The calculation of the GSE Composite Index (GSE-CI) is based on the volume weighted average closing price of all listed stocks. All ordinary shares listed on GSE are included in the GSE-CI at total market capitalization, with the exception of those listed companies which have shares listed on other markets. The GSE-CI is a market capitalization weighted index, i.e. each constituent is given weight according to its market capitalization. The base date for the GSE-CI is December 31, 2010 and the base index value is 1000.

GSE Financial Stocks Index (GSE-FSI): This index has its constituents as listed stocks from the financial sector including banking and insurance sector stocks. All ordinary shares of the financial stocks listed on GSE are included in the GSE-FSI at total market capitalization, except for those which are listed on other markets. The base date of GSE-FSI is also December 31, 2010 and the base index value is 1000.

Fiscal Policy Indicator (GOV)

General Government final Consumption expenditure (as a % of GDP) is used as the indicator for fiscal policy. From the Keynesian paradigm, a fiscal expansion is in consonance with either an increase in government expenditure or a reduction in taxes. This makes the use of the General Government final Consumption expenditure (as a % of GDP) more appropriate to measure fiscal policy. It is expected to have a negative impact on stock market activities.

Monetary Policy Indicator (LR)

The average real lending rate is used as the basic monetary policy indicator given the current emphasis on inflation targeting by the Bank of Ghana. Though the appropriate interest rate

should be the prime rate, its non availability for the entire duration under study and in quarterly series, motivated the use of the average real lending rate. This is, again, the rate at which financial institutions lend to their most credit worth investors or the rate at which they borrow from the central bank. It is expected that the average lending rate will have a negative relationship with the demand for credit.

Real expected rate of inflation (INF)

The real expected rate of inflation is measured by the ratio of the consumer price index for two subsequent periods. The CPI is chosen since it is the best measure for adjusting payments to consumers when the intent is to allow consumers to purchase, at today's prices, a market basket of goods and services equivalent to the one that they could have purchased in an earlier period. It is also the best measure to use when one wants to translate retail sales and hourly or weekly earnings into real or inflation-free figures. The conventional wisdom is that stocks should represent a hedge against inflation and thus a positive relationship between nominal stock returns and inflation should exist.

Excess Market Return

Excess market return is obtained by deducting the 3-month treasury bills rate from the GSE All-share index. It represented the yield spread between risk free and risky instruments. The higher the yield spread, the more investors are encouraged to invest in equities rather than in short term instruments such as the treasury bills. A positive relationship is expected between excess market returns and stock prices.

4.4 The Data

The study employed quarterly time series data for Ghana between 1991 and 2006. The datasets were obtained from the Ghana Statistical Service and the World Development Indicators CD Rom (Africa Edition). Data on the consumer price index and GDP were obtained from the Ghana Statistical Service; while that on the general Government final Consumption expenditure and the lending rate was obtained from the World Development Indicators CD Rom (Africa Edition). The GSE all-share index was obtained from the Ghana Stock Exchange. Since quarterly series are unavailable for some of the variables, disaggregated series were generated with E-Views (5.1).

4.5 Conclusion

As mentioned earlier, available theoretical literature from the Keynesian paradigm proposed a policy mix of fiscal and monetary policy to achieve macroeconomic goals. Given the interaction between these policies and interest rates a hypothesis was derived emphasizing an intertemporal interaction between fiscal and monetary policy and stock market activities. Given this focus, a dynamic econometric model was specified. The Cointegration Technique due Johansen and Juselius (1990) and the Granger Causality testing procedures were also proposed for estimations. The ADF unit root test was chosen to assess the stationarity status of the variables and the AIC and SBC information criteria were chosen to select the optimal lag length. Finally, various diagnostic tests were identified to aid validate the statistical significance of the study's findings.

KNUST

CHAPTER FIVE

PRESENTATION AND DISCUSSION OF THE RESULTS

5.0 Introduction

In the preceding chapter, a dynamic econometric model was proposed to examine the intertemporal interaction between fiscal policy, monetary policy and stock market activities. Accompanying this is a Granger Causality testing procedure that was proposed to facilitate the investigation of the causal link between the variables. This chapter aims at using these techniques within the said models to achieve the objectives of this study. The chapter is in three sections. The first section describes the variables selected for the study. The second presents and discusses results from the estimation process. The final section provides a summary of the various results and concluding remarks.

5.1 Data Description

The study employed quarterly time series data for Ghana between 1991 and 2006. The datasets were obtained from the Ghana Statistical Service and the World Development Indicators CD Rom (Africa Edition). For estimation purposes, some of the variables were transformed by either taking the natural logs or expressing them as rates and ratios (i.e. in percentages). Given that quarterly time series data of some of these variables are unavailable, disaggregated estimates were obtained with the aid of an econometric software package (E-Views 5.1). The transformation and the new variables are described in Table 1.

Table 1: Transformed Time Series Data

| Time Series | Denotations | Units | Transformation Type |
|-----------------------------|-------------|-------|--|
| Stock Market Activity | <i>GSE</i> | Logs | Computed as the log of the Ghana Stock Exchange All-share Index |
| Monetary Policy Indicator | <i>LR</i> | % | Computed as the average of the Lending Interest Rate |
| Fiscal Policy Indicator | <i>GOV</i> | % | Computed as the General Government final Consumption expenditure as a % of GDP |
| Excess Return on the Market | <i>EMR</i> | Ratio | The difference between the GSE All-Share Index and the average Lending Interest Rate |
| Inflation | <i>INF</i> | % | Computed as the ratio of current CPI and Previous CPI |

Source: Data from Ghana Stock Exchange and Bank of Ghana

To ascertain the stationarity status of the variables under investigation, the Augmented Dickey Fuller (ADF) test for unit roots is applied on the selected variables. This test ensured that variables enter the selected VAR model, developed in the previous section, in a non-explosive form and are robust.

Table 2: Results for Unit Root (ADF and DF-GLS)

| Variable | ADF Statistics | |
|------------|------------------|----------------------------|
| | Level | 1 st Difference |
| <i>GSE</i> | -1.1621 (0.6854) | -4.3028 (0.0000) |
| <i>LR</i> | -1.1704 (0.6821) | -7.1902 (0.0000) |
| <i>GOV</i> | -2.1799 (0.2156) | -2.3524 (0.0192) |
| <i>EMR</i> | -0.8384 (0.8007) | -4.1126 (0.0001) |
| <i>INF</i> | -7.0122 | ... |

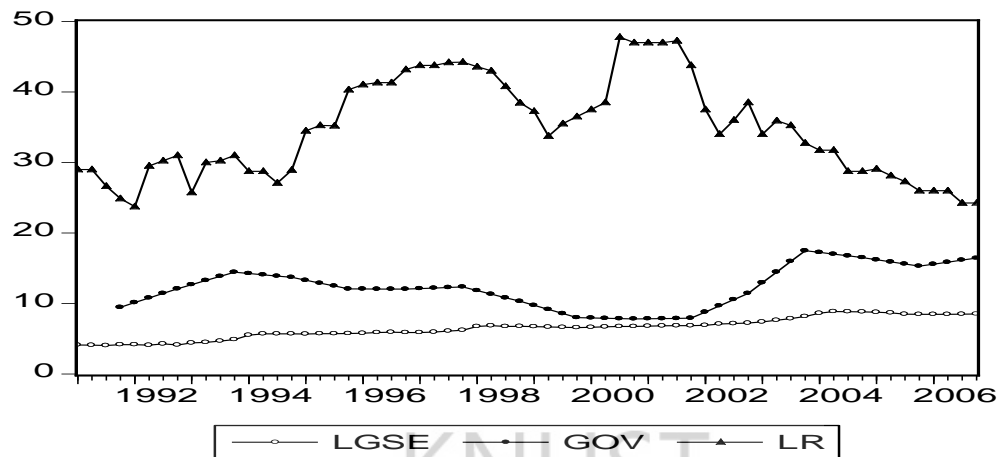
Source: Data from Ghana Stock Exchange and Bank of Ghana

Estimated from E-Views 5.1. P-values are in parenthesis.

The ADF test statistics are presented in Table 2. These test statistics are compared to the critical values from MacKinnon (1996) to conclude on the stationarity status of the series. As can be learned from the p-values, in Table 2, almost all variables selected for the estimation process were not stationary on their levels, with the exception of *INF* – which happened to be stationary on level. This suggests some sought of trending in the variables selected. A more formal test will be to plot the series to examine this trending.

To complement the above test, a graphical illustration (See Figure 1) between the most critical variables under investigation is presented in Figure 1. The graph suggests indicators for fiscal policy, monetary policy and stock market activities have been increasing overtime with monetary policy showing some intermittent swings and decreasing towards the late 2000's. This supports the above assertion that there appears some degree of trending in the variables under investigation.

Figure 1: A graphical representation between FDI and private investments



Source: Data from Ghana Stock Exchange and Bank of Ghana

Table 3 contains some descriptive statistics for the indicators of fiscal policy, monetary policy and stock market activity. From the table it can be observed that the variable with the highest average is the indicator for monetary policy. This is followed by the indicator for fiscal policy and last, the indicator for stock market activity. It can also be observed that the indicator for stock market activity has the lowest standard deviation; with the indicator for fiscal policy and monetary policy following in an ascending order respectively. This confirms the above claim that the indicator for monetary policy has been exhibiting some intermittent swings. The correlations among the three indicators range from 0.01389 to 1.000 with the correlation between the indicator for fiscal policy and stock market activity being the highest (pairwise).

Table 3: Descriptive Statistics for Selected Variables

| | LGSE | GOV | LR |
|---------|----------|----------|----------|
| Mean | 6.500204 | 12.31581 | 34.73531 |
| Median | 6.699419 | 12.12168 | 34.245 |
| Maximum | 8.86013 | 17.5028 | 47.75 |
| Minimum | 4.055257 | 7.8272 | 23.75 |

| | | | |
|--------------|----------|----------|----------|
| Std. Dev. | 1.43993 | 2.903673 | 6.981046 |
| Skewness | -0.04952 | 0.004222 | 0.267715 |
| Kurtosis | 2.155093 | 1.963503 | 1.888455 |
| Jarque-Bera | 1.929807 | 2.730757 | 4.059247 |
| Probability | 0.38102 | 0.255284 | 0.131385 |
| Sum | 416.013 | 751.2645 | 2223.06 |
| Sum Sq. Dev. | 130.6241 | 505.8789 | 3070.306 |
| Observations | 64 | 61 | 64 |

Correlation Matrix

| | LGSE | GOV | LR |
|------|----------|----------|----------|
| LGSE | 1 | 0.427175 | 0.01389 |
| GOV | 0.427175 | 1 | -0.60765 |
| LR | 0.01389 | -0.60765 | 1 |

Source: Data from Ghana Stock Exchange and Bank of Ghana
Estimated from E-Views 5.1.

Fortunately, the correlation between the indicator for stock market activity and monetary policy is negative and weak. This suggests the numerous financial sector liberalization programs aimed at reversing the financial repressive state of the financial sector of Ghana has succeeded in an enabling macroeconomic environment for the financial market and particularly the capital market.

5.2 Cointegration test for the intertemporal interaction between Fiscal Policy, Monetary Policy and Stock Market Activity (1991 – 2006)

For a lag length of 2 (selected by Akaike Information Criteria – AIC), there was no evidence of a cointegrating relation between variables selected (See Table 4). Both the trace and the eigen values selected no cointegrating equations. Thus estimations were done without an error correction term (these results are available upon request).

Table 4: Test for the number of cointegrating equations

| | | | | | |
|-------------|--------------------------|-----------------------|-----------------------|--------------------|--------------------|
| Data Trend: | None | None | Linear | Linear | Quadratic |
| Test Type | No Intercept No Trend | Intercept No Trend | Intercept No Trend | Intercept Trend | Intercept Trend |
| Trace | 0 | 0 | 0 | 0 | 0 |
| Max-Eig | 0 | 0 | 0 | 0 | 0 |

*Critical values based on MacKinnon-Haug-Michelis (1999)

Table 5 presents the results of the vector autoregressive estimates for the study, along with some regression diagnostics (i.e. the R-square, adjusted R-square and an F statistic). The regression result indicates a mixed short run relationship between fiscal policy actions and stock market activity. Particularly, an increase in government spending immediately increases activities in the stock market, but in the next period this activities decline. On the other hand, monetary policy actions seem not to have any effects on stock market activity and there are no reciprocal interactions between the variables selected.

Table 5: Vector Autoregressive Estimates

| | LGSE | GOV | LR |
|----------|--------------------------------------|--------------------------------------|------------------------------------|
| LGSE(-1) | 1.167102** -0.12345 [9.45438] | -0.00453 -0.32325 [-0.01403] | 3.146122 -2.52207 [1.24744] |
| LGSE(-2) | -0.20043 -0.11624 [-1.72429] | 0.105006 -0.30438 [0.34498] | -3.10812 -2.37481 [-1.30878] |
| GOV(-1) | 0.144991** -0.03042 [4.76649] | 1.82934** -0.07965 [22.9661] | -0.79636 -0.62147 [-1.28140] |
| GOV(-2) | -0.12366 -0.02861 [-4.32261]** | -0.88201** -0.07491 [-11.7736] | 0.309748 -0.58449 [0.52994] |
| LR(-1) | 0.009248 -0.00696 [1.32783] | -0.00832 -0.01824 [-0.45619] | 0.773035 -0.14229 [5.43290] |
| LR(-2) | -0.00027 -0.00679 [-0.03917] | -0.00845 -0.01778 [-0.47508] | -0.02633 -0.13872 [-0.18983] |
| C | -0.29446 | 0.57357 | 12.60116** |

| | | | |
|-----------------------|-------------------------------------|--------------------------------------|--------------------------------------|
| | -0.25026 [-1.17662] | -0.65532 [0.87525] | -5.11291 [2.46458] |
| INF | -0.0009 -0.00133 [-0.67765] | 0.003073 -0.00348 [0.88349] | 0.072958** -0.02714 [2.68856] |
| EMR | 1.61E-06 -2.50E-05 [0.06441] | -3.62E-05 -6.60E-05 [-0.55222] | 3.30E-05 -0.00051 [0.06445] |
| R-squared | 0.993283 | 0.990646 | 0.895839 |
| Adj. R-squared | 0.992208 | 0.989149 | 0.879173 |
| F-statistic | 924.169 | 661.9055 | 53.75331 |

Source: Data from Ghana Stock Exchange and Bank of Ghana

This result lends credence to the stock market efficiency hypothesis with respect to monetary policy actions in Ghana and it is consistent with the findings by Darrat (1998) and Laopodis (2008).

It thus appear fiscal policy actions have important implications for stock market activity in Ghana and not monetary policy actions. What could possibly account for this finding?

First of all, it is rather surprising that economic literature, as mentioned in the previous section, has not dealt much with the impacts of fiscal policy actions on stock market activity despite the evidence that expansionary fiscal policy actions do lead to the ‘crowding-out’ of real investment through higher interest rates, which intend lower stock returns. Perhaps market participants are not aware of the full impacts of fiscal policy on stock market activity and, as such, they do not consider it relevant or fundamental in the pricing/valuing of stocks.

Second, it is likely investors in the Ghanaian stock exchange are fully aware of the impact of monetary policy actions on stock market activity and have fully incorporated this in the pricing of securities. Hence there is no incentive to outwit the market by doing any technical or fundamental analysis and concentrating on monetary policy.

Lastly, the relatively young nature of the market cannot be ruled out. While on the average, the number of companies listed on the exchange has been increasing overtime, it still needs to meet certain yardsticks for the market to be comparable to other more advanced stock exchanges where monetary policy actions could easily spark portfolio re-allocations for investors.

5.3 Tests for Causality between Fiscal Policy, Monetary Policy and Stock Market Activity in Ghana (1991 – 2006)

To harmonize the findings in the previous section, a Granger causality test is conducted between the indicators for fiscal policy, monetary policy and stock market activity. The result for the Granger causality test is presented in Table 6.

Table 6: Pairwise Granger Causality Test

| Pairwise Granger Causality Tests | Obs | F-Statistic | Probability |
|----------------------------------|-----|-------------|-------------|
| Null Hypothesis: | | | |
| GOV does not Granger Cause LGSE | 57 | 4.99861 | 0.00189 |
| LGSE does not Granger Cause GOV | | 0.87781 | 0.48426 |
| LR does not Granger Cause LGSE | 60 | 0.54607 | 0.70266 |
| LGSE does not Granger Cause LR | | 1.68135 | 0.16869 |
| LR does not Granger Cause GOV | 57 | 1.44485 | 0.23377 |
| GOV does not Granger Cause LR | | 2.14165 | 0.09002 |

Source: Data from Ghana Stock Exchange and Bank of Ghana

The result suggests the fiscal policy actions (GOV) do granger cause stock market activity. More also, it was observed that the fiscal policy actions (GOV) does granger cause monetary policy actions (LR). Strangely, these variables were established to be insignificant in the previous section.

One important conclusion from this section that complements results from the previous section is that fiscal policy actions are crucial for stock market activity in Ghana. Hence investors in the market should incorporate such actions in the pricing of securities to eliminate all inefficiencies in the market to build investor confidence.

5.4 Conclusion

This chapter described the variables selected for the study and also discussed results from the estimation process. At the end, a relationship was established between fiscal policy action and stock market activity. Also, a unidirectional causal link was established to be running from fiscal policy actions to stock market activity. This evidence suggests investors in the market should incorporate such actions in the pricing of securities to eliminate all inefficiencies in the market to build investor confidence.



CHAPTER SIX

SUMMARY AND RECOMMENDATIONS

6.0 Introduction

This chapter provides a general summary and conclusion for the study, as well as recommendations for policy analysis and further studies. At the end of the chapter, limitations of this study will be provided.

6.1 Summary and Conclusion of the Study

The study examined the intertemporal interaction between fiscal policy, monetary policy and stock market activity in Ghana. This is in line with theoretical contention of the Keynesian economics that a policy mix of fiscal and monetary policy is the best in achieving macroeconomic objectives. Though this proposition is supported by a number of empirical evidences and sounds great, its interaction with interest rates suggest such policies may have a concurrent effect on stock market activities. This is the case as changes in any of the fiscal or monetary policy instruments (like government spending, taxes, money supply and interest rates) change market interest rates instantaneously and forces investors to revalue their equity holdings.

In that way, stock market activity is either enhanced or disrupted. Thus the study attempted to examine the intertemporal interaction between fiscal policy, monetary policy and stock market activity.

To accomplish this, vector autoregressive model is developed and estimated. A Granger causality test is also conducted to complement the above estimations. Further, diagnostic tests were carried out to ensure all models satisfy the assumptions of the estimation techniques selected.

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The results, both from common correlation analysis to recent econometric modeling, indicate fiscal policy actions have significant effects on stock market activities and not the other way round. In addition, there is a unidirectional causal effect of fiscal policy actions on stock market activity. It was thus concluded that the fiscal policy actions do matter in the activities of stock market activities and, perhaps, becoming more important over time. Thus such actions should be incorporated in the pricing of securities in the market to eliminate all inefficiencies in the market and build investor confidence.

6.2 Recommendations for Policy Analysis and Further Studies

Based on the study's conclusions, the following policy recommendations are suggested. Accompanying these recommendations are proposed areas for further studies.

First, investors in Ghana should take into cognizance fiscal policy actions in their decision making process or more precisely include information and/or warnings of the growing size of government final consumption expenditure in their decision making process as it has important financial implications .

Secondly, the government must synchronize its fiscal policy actions with activities in the stock market. Such a move is critical as it has been established that stock market volatilities has varied implications for the economy as a whole.

Finally, another useful exercise would be to see if deficits are becoming more and more important in the eyes of investors using different methodologies and additional data/variables. Moreover, that study could be extended to draw inferences about market efficiency with respect to government deficits.

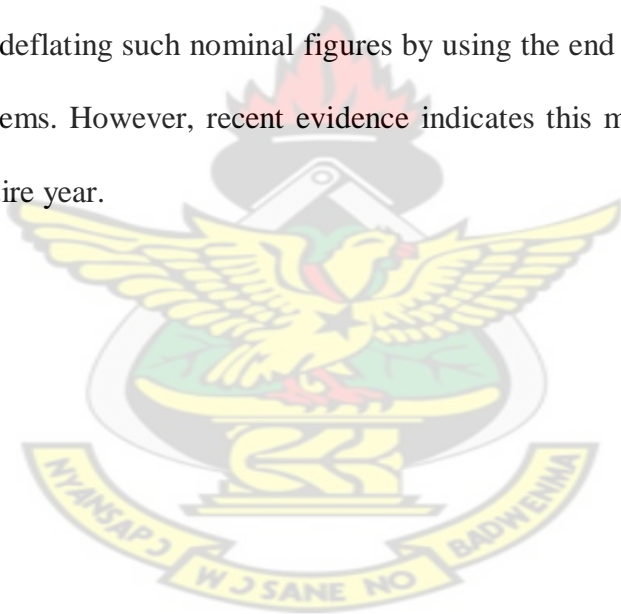
6.3 Limitations of the Study

Two important limitations were identified to have confronted this study.

First, econometric techniques, most often, used in analyzing level relationships between two or more variables may have some inherent limitations for policy recommendations. The reason being that the results from these techniques may not be equivalent to the many philosophical notions of level relationships; implying, their interpretations may also be misleading. Again, even if the results are consistent with philosophical notions, the fact that different econometric software (though may provide similar results for each of these techniques) report different

critical values depending on the sample size being used may lead to the acceptance of a null hypothesis, even if they are untrue.

Second, deflating nominal values by the conventional method of dividing such values by CPI to obtain real values are inconsistent with the concept of stocks and flows. Though, authors such as King and Levine (1993a) attempted to solve this problem by taking the average of the balance sheet items in year t and $t-1$, Calderon and Liu (2002) mentions that this may not fully resolve the distortion caused by high Inflationary environments. Beck et al (2000) went further to provide a better way of deflating such nominal figures by using the end of year CPI on each end of year balance sheet items. However, recent evidence indicates this may not be a particularly good average for the entire year.



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